INTERDEPENDENCE

Coordinating Public-Private Service Networks

Bram Klievink

UNRAVELLING INTERDEPENDENCE

Coordinating Public-Private Service Networks

Proefschrift

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Preface and acknowledgements

During the years of the research that this book is the result of, I became more of a service consumer of government organisations. The administrative aftermath of acquiring a Master's degree, marriage, buying a house, increasingly complex Tax filings; all these developments resulted in more and more service requests towards government from my side. During these years, I have had two perspectives on government service delivery, one of a service consumer and the other of a researcher of public service delivery. Based on my research, the service consumer in me would see all kinds of possibilities for government organisations to improve service delivery, primarily through better collaboration with other parties, both public and private. At the same time, the researcher in me knows of the hurdles and difficulties that organisations and public servants face to realise this. Furthermore, as a participant in multiple projects with government partners, I know that there are many good people in Dutch government that are committed to overcoming these hurdles and difficulties. This does not just require an innovative view on services, but also insight in the current organisational, process, and technical complexities that make realising service delivery improvements difficult, and the stamina to in fact realise them. It is the first two that this research can contribute to; to the first by selecting public-private service networks as the object of study, taking an inherently cross-organisational and cross-sector view on services in which the services are offered in an integrated manner to better match the overall service process of citizens and businesses. To the second this research contributes by unravelling the interdependencies that come with such complex service delivery constellations. The third, however, requires commitment, perseverance, and patience by all those who dedicate their work to improving the functioning of government as a whole, and public service delivery in particular.

I have worked with a number of people that want to – and can – do this. This was primarily in the B-Bossier and Kanalen in Balans projects, which aimed to enhance the knowledge on how (electronic) public service delivery can be improved. In these projects, a team of researchers from various backgrounds and disciplines worked closely with practitioners and policy makers from a variety of government organisations. All of them deserve my thanks, as these projects are a key part of the research presented in this dissertation. I would like to thank all the people from government that I have worked with over the past years, in the research projects and in the Alliance for Vital Governance (AVB, in Dutch). They provided me with an in-depth understanding of how government organisations work. There is only so much you can learn from textbooks and literature. You can only gain a feeling of what actually happens within complex organisations, and why, through extensive conversations with experts from practice. Without the close collaboration with practice, I would have never known what I know now.

I think that communities such as the AVB are very important to keep the conversation between researchers and policy makers going. It forces both groups to step outside their own environment and although not every endeavour is successful, collaboration between researchers of various disciplines and practitioners is – I believe – necessary for researchers to do research that is relevant to practice and for policy makers to make better informed decisions on today's complex issues. Therefore, I hope that the network we built in the AVB will persist; now the AVB itself does not. At least, I would like to express my thanks to all practitioners, policy makers, and researchers from other institutes and universities that I have worked with. They have all greatly contributed to seeing that every issue has more sides to it than meets the eye.

I would like to thank René Wagenaar, who sadly passed away before I could even properly begin my research, for initiating this research and getting me to Delft University's faculty of Technology, Policy and Management, which has over time proven a very interesting and dynamic environment for conducting scientific research with practical relevance. Given the still growing importance of technology in our ever more complex world, this faculty's expertise on linking technological challenges and opportunities to the multi-actor social context in which these technologies operate can in the years to come only become more important to both academia and practice.

Yao-Hua Tan got involved in my research about halfway, and caught up quickly. I am glad that he is my promotor. I am also grateful to Thea van der Geest, who directed me to Marijn Janssen. Marijn was the co-initiator of my research and saw value in my somewhat unusual combination of studying business information systems first and political science after that. The research topics I have been working on, and am still working on today, prove that an understanding of the technical background can well be combined with a political antenna, especially when working on the use of ICT in government. Marijn; thank you for supporting me throughout my research; I am proud that you are my co-promotor.

Over the years, I have benefited from discussions with a great many more people than I could possibly mention here. One of them especially deserving thanks is Arre Zuurmond. He is probably one of the most knowledgeable people on ICT in government in The Netherlands, being able to link practical problems to fundamental questions, those questions to theory on organisations, and ultimately back to practice. I benefited greatly from discussing my research, from early ideas to drafts of chapters, with him. To these discussions he dedicated much of his valuable time. I am also thankful to all my colleagues for making sure that a work environment is also a much-needed social environment. Nitesh and Anne Fleur were always available for peer consultation on content or process. Over the years, I've shared my office with Jaro, Ralph, Janneke and Jie, who were (because they had nowhere to hide) always good listeners to my many minor comments on nearly everything. Others, like Jolien, Eveline, Jo-Ann and (in the past) Jeffrey, were always ready to help or just listen, if

needed. Although they deserve it, I cannot mention all colleagues in the section and faculty that were there during my research. Thank you all.

Finally, to remind me that there is life beyond work, my family and friends were invaluable. Thanks to my parents and brothers, for always supporting me. Eppo (who designed the cover of this book) and Bart, friends for over half my life, thank you for making sure that there is always time to not think and talk about work. Sjoerd, Wouter, John, Martijn and Tim, friends with a shared interest in political matters, thanks for showing that the line between very serious discussions and total nonsense can be very thin. Thanks also to the friends I gained through meeting Marjolein, my wife. Especially to her, I am greatly indebted for understanding and supporting me in times that work and personal life struggled for preference. As if undertaking a PhD research is not enough, I managed to take a number of other major steps in my life at the same time. Even if I had not underestimated the huge challenge that a PhD research presents, undergoing all these major changes in just a couple of years would have been a lot already. She helped me through and made sure none of them were too much. The biggest and best change in my life is Ilse, our daughter, who put everything in perspective. Marijn, she proved you right: this is not a life's work; it is 'just' a PhD thesis, not more, certainly not less.

Bram Klievink

1 Introduction: public-private service delivery – a challenge

"Today's problems come from yesterday's solutions"

- Peter Senge -

Imagine setting up a business, with the notary or the chamber of commerce as the only point of contact, also on behalf of the public organisations involved. Or requesting a new passport or driver's license online at the municipality with the option to pick it up at a local Post Office, a bank, or another (trusted) business with an office location nearby. These examples are not far-fetched and are becoming reality now, supported by Information and Communication Technology (ICT). Such models for the delivery of public services can be envisaged for many situations, as – from the perspective of the users of services – many services do not stop at organisational boundaries or at the boundaries between the public and the private sector. This situation of services that transcend the boundaries between departments, organisations, and sectors, is depicted in **Figure 1**.

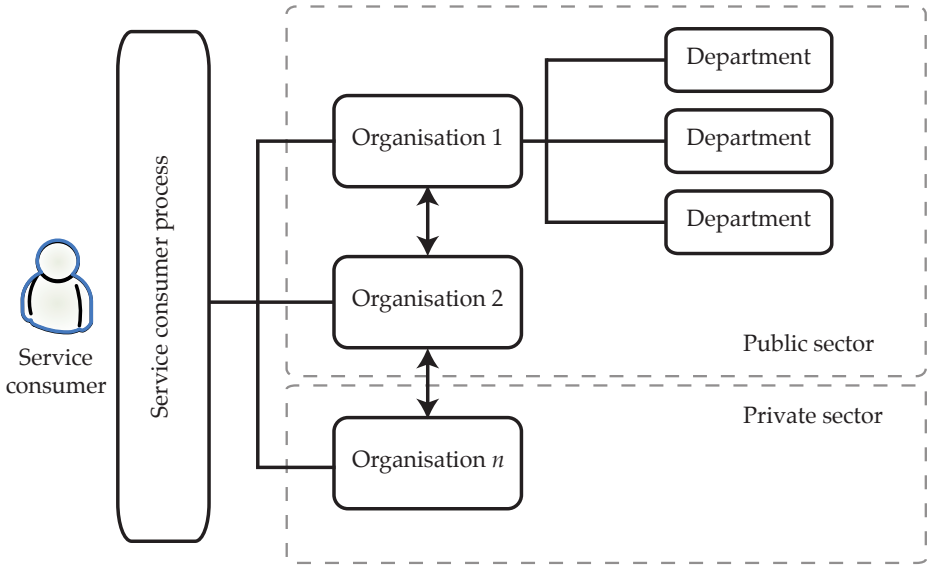

Figure 1: **cross-department, cross-organisational and cross-sector service delivery**

The main characteristic is that public and private organisations coordinate their efforts to better support the overall process that a service consumer goes through. There are numerous examples of services in which service delivery can be made more

convenient for service consumers if public and private organisations collaborate and offer their services in an integrated manner. However, this is a major organisational and technical challenge for the organisations involved. In this chapter, we introduce the background of service delivery integrated across organisational boundaries of both public and private sector organisations. Furthermore, we discuss why realising such public-private service delivery is a challenge and formulate this into a research problem that this research seeks to address.

1.1 Background: towards public-private service delivery

Governments aim to improve service delivery by offering integrated services, ultimately in such a way that – from the perspective of the service consumer – services are available electronically and are seamlessly integrated across the organisational and system boundaries (Andersen & Henriksen, 2006; Layne & Lee, 2001; Moon, 2002; U.N., 2002; West, 2004). In their attempt to realise demand-driven and integrated service delivery, government organisations use ICT (Bekkers, Van Duivenboden, & Lips, 2005; Wimmer, 2007). The full integration of services is not always attainable and therefore services are often made consistent across organisational boundaries (6, 2004). This is found in the developments of one-stop-shop portals, in which multiple government organisations offer information and, sometimes, transaction services to citizens and businesses in one place and in a coherent way (Wimmer, 2002b). In the Netherlands, such integrated service delivery is primarily realised at the organisational level. Many individual government organisations aim to provide (online) one-stop-shops for their own products and services. However, for many public services, citizens and businesses still have to orchestrate various interactions with multiple government organisations, or even with multiple departments within one organisation.

To deal with this, cross-organisational service integration goes beyond the level of a single organisation. Then, the actors that provide parts of a bigger service manage the dependencies between the various components of service delivery. The underlying idea is that many service delivery processes – from a service consumer perspective – span activities of multiple actors, such as organisations or departments within those organisations. Whereas the burden of orchestrating the interactions that follow from these activities is currently often put on the service consumer, in integrated service delivery this burden is transferred to the joint service providers, as they offer a service in an integrated manner.

Realising this will pose a tremendous challenge for most government organisations (Moon, 2002). It entails a fundamental shift towards a perspective on service delivery from the outside in, instead of from the inside out (thus, taking a demand perspective, instead of a supply perspective). This means that the functionality offered by an organisation is viewed from the perspective of citizens and businesses ("from the

outside"). A limited example, involving only one organisation, is a request for a certain permit. From the perspective of an individual organisation (e.g. a municipality) or a department within that organisation, assessing an individual permit request is the service provided to this citizen. If the citizen requires multiple permits (because this one is part of a bigger project), multiple departments may be involved in assessing various permit requests. Furthermore, as most of the departments or organisations have a relatively large degree of autonomy, they have their own processes and supporting technology. The government organisation in this case delivers multiple services in the form of multiple permit grants or rejections. However, from the perspective of the citizen, the individual permits of the various departments are only part of a broader service, such as municipal approval of the building plans. Since this involves multiple processes at multiple departments, the realisation of such a greater service is complicated by the fragmentation of the organisational structure, tasks, information systems, and data.

This example covers only one organisation, which is fragmented along functional lines. For many services, multiple organisations are involved. The idea that service delivery processes transcend organisational boundaries is often depicted in service delivery chains, in which the activities of individual (government) organisations are part of a series of such activities by multiple organisations, often supported by ICT (Van Duivenboden, Heemskerk, Luijtjens, & Meijer, 2005). The concept is similar to that of supply chains in business, in which organisations and their products and services, from gathering raw material, via the production of semi manufacture, logistics and the production and sales of an end product, are regarded as part of a single chain. Governments also started to view their services in terms of chains. Also in The Netherlands, service chains and their hurdles have been receiving attention. A key motivation for working in service delivery chains and directing ICT efforts to facilitate the collaboration in these chains is the reduction of the administrative burden for service consumers (Janssen et al., 2010; Van der Hauw, Linssen, Nijsen, & Tom, 2004).

1.1.1 Collaboration with private partners

The orientation towards actual service demand requires that organisations start to collaborate with partners in the chain to facilitate service requests that transcend the boundaries of individual departments or organisations. However, from the perspective of service demand, processes do not only cross the boundaries of organisations inside the public sector, but also transcend the boundaries between the public and the private sector (e.g. Milward & Provan, 2003). A wide variety of private organisations are often involved in many things a government does, including service delivery. Sometimes private parties act as an intermediary party between government organisations and citizens to offer related services in one place. Also, the privatisation

movement of the past decades transformed previously state-owned organisations into private-held companies, but did not always alter the role they play in the public sphere. The boundaries between organisations and between the public and private sector are blurring (e.g. Flinders, 2005; Selsky & Parker, 2005).

In a wide variety of ways, collaboration with (and sometimes outsourcing to) private parties and other levels of government is seen as a way for (central) governments to improve its operations, including service delivery, which has the focus of this research (e.g. Bertelli & Smith, 2010; Fountain, 2001a; Heinrich, Lynn Jr., & Milward, 2010; Kamarck, 2007; Kettl, 2006; McGuire, 2006; Milward & Provan, 2000; Provan, Isett, & Milward, 2004; Salamon, 2002a; Selsky & Parker, 2005). The specificities vary, but there is much literature on public sector reform that foresees a role for the private sector, in the sense that collaboration between the public and the private sector is deemed important to realise public values and goals (e.g. Agranoff & McGuire, 2003; Christensen & Lægreid, 2007; Goldsmith & Eggers, 2004; Stoker, 2006).

1.1.1.1 Background of private partners: the New Public Management

In this research, the term 'private' will be used to distinguish between the public sector and organisations outside that sector, even though it is sometimes difficult to demarcate between the sectors. Thus, by public-private we essentially mean cross-sector, which includes public-private, but may also include public-non-profit or tri-sector (cf. Selsky & Parker, 2005). We focus on services provided to individual service consumers (e.g. citizens) and that are supported by ICT, resulting in enduring exchange relationships between the service providers (Podolny & Page, 1998). We exclude public-private collaboration in – for example – roads, housing, and landscape development. The latter set of collaborations is often covered in research on public-private partnerships (PPPs), for example in infrastructure projects (e.g. Grimshaw, Vincent, & Willmott, 2002; Koppenjan, 2005; Pongsiri, 2003). Such public-private partnerships often bring complex arrangements to distribute costs, benefits, share risks, etc., for a particular project. Public-private collaboration also introduces multiple – potentially conflicting – interests, goals and values (e.g. Flinders, 2005; Rosenau, 1999).

A stream of literature that argues in favour of a larger role of private partners in government operations is the New Public Management (NPM) movement. In terms of service delivery, the underlying idea is that private organisations have – over time - become more innovative and customer-friendly, while public services were still quite the same (Kamarck, 2007). Therefore, they argue that governments should operate more like private organisations and think of delivering services to 'customers' (e.g. Osborne & Gaebler, 1992). The NPM movement urged government agencies to use business-like strategies to increase service-levels and to decrease costs (e.g. Beynon-Davies, 2007; Osborne & Gaebler, 1992). This all is rooted in a critique of traditional

bureaucracy that is fairly typical for the "Anglo-American-Australasian" world, according to Pollitt and Bouckaert (2004, p. 61). Osborne and Gaebler (1992) argue that the 'traditional' public management should be replaced by the 'new' public management because "[h]ierarchical, centralized bureaucracies designed in the 1930s or 1940s simply do not function well in the rapidly changing, information-rich, knowledge-intensive society and economy of the 1990s" (Osborne & Gaebler, 1992, p. 12).

According to Pollitt and Bouckaert (2004), NPM has a high level (in words if not in deeds) of rhetoric, with most real NPM based reform occurring in the Anglo sphere. Mainland Europe, including The Netherlands, is attributed a Neo-Weberian approach. In such an approach the shift is not fundamental and (European) governments are still organised bureaucratically, albeit the structure is updated to contemporary demands (Pollitt & Bouckaert, 2004). Furthermore, the NPM notion that the citizen-government relationship should resemble a business-customer relation is contested. Some argue that the approach has gone too far, that government is not a business and citizens are not purely customers. A key argument in the critique on NPM is that a business rationale is not fully applicable in the public sector (see, e.g. Mintzberg, 1996). A decline in the 'belief' in NPM is noticed both in practice (e.g. Ter Bogt, 2002) and in theory (e.g. Dunleavy, Margetts, Bastow, & Tinkler, 2006). Still, the need for a different, improved government persists, but the changes in the public sector have moved on from the ideal of enterprising government (e.g. Dunleavy, et al., 2006; Stoker, 2006).

1.1.1.2 Towards collaboration: public-private service networks

Contemporary literature on public sector reforms are often a response to the harsh elements in NPM reforms by transforming – or at least rebalancing – the main features of NPM while at the same time striking to overcome the issues with efficiency and effectiveness in government that NPM was a response to in the first place (Christensen & Lægreid, 2007; Stoker, 2006). One of the key elements of contemporary reform ideas is that governments should get public organisations to work across boundaries and focus on collaboration between departments, organisations, and the public and the private sector. These ideas come under different headings, such as New Labour's "joined-up" government in the United Kingdom, or the concept of "collaborative" public management or -governance that is popular in the United States (Agranoff & McGuire, 2003; Christensen & Lægreid, 2007; Heinrich, et al., 2010; Kamarck, 2007; O'Leary, Gerard, & Bingham, 2006).

The trend towards more collaboration with private parties is also recognised in the Dutch situation. For example, the commission on Municipal Service Delivery, influential in developing the vision on public service delivery in The Netherlands, argues that more collaboration between organisations in both the public and private

sector is needed for improving service delivery (Commissie Gemeentelijke Dienstverlening / Commissie Jorritsma, 2005). The same commission also argues that a lot can be gained by better coordination between the links in a service delivery chain. More recently, the Minister of Economic Affairs – in response to an advice of the Social and Economic Council – announced that there is no (ideological) choice between government and market, but that the two sectors complement each other (Dutch Ministry of EL&I, 2011). In other words: both literature and policy developments focus no longer on the idea of public *versus* private, but on public *and* private.

Collaborative, inter-organisational *networks* have become a common way to deliver public services, as governments want to improve their service delivery in such a changing environment (e.g. Provan & Milward, 2001). To improve service delivery, lower the administrative burden for citizens and business and to better address their needs, these networks have to take over the task of coordinating the various components of a service from the service consumer. Although the views vary, contemporary literature argues that governing by hierarchical control has to be – or is – substituted by a network approach in which both public and private organisations are involved, although the involvement of the private sector has to be different from the partnerships and outsourcing relationships that were a central part of NPM (e.g. Dunleavy, et al., 2006; Fountain, 2001a; Milward, Provan, Fish, Isett, & Huang, 2010; Salamon, 2002c; Stoker, 2006).

Such networks, comprising both public and private organisations, which realise public service delivery that transcends the boundaries of the individual organisations, are what we call *public-private service networks*.

The scope of this thesis is on integrated, cross-organisational service delivery by such public-private service networks. By service delivery we mean the facilitation and execution of the tasks that follow from the obligations or entitlements that individual citizens and businesses have towards government. Service delivery includes processes and tasks that governments invoke in either doing something for a citizen or business, or claiming something of them. Both the provision of a passport and the collection of taxes are considered service delivery. As such, it goes beyond policy of public-private collaboration, and focuses on actual operations, supported by ICT. In this thesis, we will discern service providers (e.g. individual organisations) and "service consumers" (cf. Pollitt & Bouckaert, 2004, p. 180), and thus further avoid terms such as 'customer' and 'client' (note that the word to designate the user of public services has been subject of debate itself, in which we will not participate).

1.2 The challenge in public-private service delivery

Integrating service delivery processes across organisational boundaries is a challenging undertaking and is not just a question of defining such processes. In this section, we discuss two challenges that make the realisation of public-private service delivery arrangements difficult beyond the realisation of 'just' a joint service delivery process. The first is on the challenge of transcending the boundaries between organisations and the public and private sector (e.g. Fountain, 2001a; Goldsmith & Eggers, 2004; Kamarck, 2007). This is especially related to the fragmentation of many organisations and the rise of networks as a form of organising (e.g. De Bruijn & Ten Heuvelhof, 2007; Powell, 1990). Second, we argue that a fragmented organisational structure and a consequently fragmented ICT landscape results in a situation in which ICT is not just an enabler of integrated service delivery, but also a challenge (e.g. Bannister, 2001; Layne & Lee, 2001; Lips, Bekkers, & Zuurmond, 2005).

In brief, the argument is that realising public-private service delivery is not just about realising cross-organisational processes, but is also a challenge at the organisational and technical level.

1.2.1 Transcending organisational boundaries

Apart from reducing the administrative burden for service consumers, the vision of integrated service delivery is often driven by efficiency and effectiveness (Layne & Lee, 2001) and seeking economics of scale (Andersen & Henriksen, 2006). Integrated services may not only reduce the administrative burden for citizens and businesses, but may also increase the efficiency of governments' operations. On the other hand, this requires an integration that will require tremendous resources and time (Moon, 2002).

While integration is sought after for the services, systems and information, there is a strong organisational component in the changes of government operations. Given the autonomy of many government organisations, integration at the inter-organisational level is perhaps unattainable. Therefore, the term *joining-up* is sometimes used as an alternative to describe the integration of services without integrating the operations of the organisations, and thus respecting the autonomy of organisations (cf. 6, 2004). Nonetheless, organisations will have to give up some of their autonomy and power if the ideal of integrated e-government is to be realised, Moon (2002) argues. Increased transparency and accountability will have great impact on the way government employees will have to conduct their work (Andersen & Henriksen, 2006).

Integrated services and the provisioning of information and services through a single point of contact is thus only part of the story. The inter-organisational view that is necessary when integrating across boundaries of organisations will also require the "reorganization of internal administrative structure of government's responsibilities

to process these services: in effect eliminating administrative boundaries" (U.N., 2002, p. 20). This requires collaboration at all levels (U.N., 2002).

1.2.1.1 Fragmented organisations

Realising integrated service delivery is a challenge, even within organisations. In essence, integrating services is a response to the fragmentation of organisations, their functions, and information systems. This is a fairly typical situation for governments, as specialisation, automation, and relatively large degrees of autonomy of organisations and departments resulted in function-oriented siloes within organisations and government, supported by monolithic systems (Bannister, 2001; Layne & Lee, 2001). Many products and services that service consumers require of government organisations span multiple sources of information, processes, and departmental and organisational boundaries. Users of public services often have to identify and split up the various components of their service request to match the offerings of service providers and contact each service provider individually. This results in a large administrative burden. Often, the dependencies between the organisations that play a role have to be managed by citizens or businesses themselves, for example by acquiring a form at one place to be used at the next, even if both are government offices. Even departments that do not have direct contact with citizens or businesses may play a role somewhere in the service delivery chain.

If services are to be integrated, the fact that service execution is fragmented throughout organisations should not pose a barrier for service delivery. However, many organisations in government – including the Dutch, which has the main focus in this dissertation – have a large degree of autonomy. Furthermore, even within the organisations, departments are relatively autonomous. This resulted in a 'siloed' structure of many government organisations, with departments, their processes, and systems functionally separated from other departments (Layne & Lee, 2001). Information systems within such structures are – as a result of decades of introspective development – also very fragmented. The silo (also referred to as stovepipe) problem thus involves an information system landscape of "large, diverse, unintegrated and frequently ageing systems" (Bannister, 2001, p. 66). Thus, even though we focus on service processes that cross the boundaries of organisations, the fragmentation within the organisation impacts the challenge, as the departments within organisations are also actors in the network.

1.2.1.2 Networks of different organisations

Although the structure of government is one of the reasons for the argument to look more towards the private sector (as depicted in § 1.1), the structure of government is also purposive. The division of powers is a hallmark of a democratic system (Scholl, 2009) and bureaucracy has important values, such as continuity and a high

commitment to equity (Pollitt & Bouckaert, 2004). Still, the structure of government should not render the government dysfunctional (Scholl, 2009). The idea that traditional structures render governments dysfunctional is voiced by public sector reformists, who hold that the public sector is rigid and inefficient (e.g. Osborne & Gaebler, 1992). Goldsmith and Eggers (2004) contrast the traditional hierarchical structure of government with governing by network. Government cannot do everything; that costs too much and increases the administrative burden. But not all can be done by the private sector either, as the market does not steer towards the collective good and may negatively impact key public values such as equality, democracy and transparency (e.g. Flinders, 2005; Pongsiri, 2003; Rosenau, 1999).

Governing by network has – according to Goldsmith and Eggers – four core components: public-private collaboration, network management capabilities, technology, and citizen demands (Goldsmith & Eggers, 2004). Note that networks are not just found as an organisational form, but are also seen as a more general development in organising society (e.g. Castells, 2010; Lips, 2005; Van Dijk, 1994). Due to the autonomy that characterises the organisations in public-private service networks, hierarchical modes of coordination – such as authoritative approaches, bureaucracy, or management – are considered ill-suited to manage the dependencies in these networks (Goldsmith & Eggers, 2004).

With respect to service delivery, the integration of activities and joining up extends to greater collaboration and integration between organisations (Kamal, Weerakkody, & Jones, 2009). Traditional command and control mechanisms are substituted by complicated relationships managing the interactions among businesses and (semi) autonomous government agencies. To meet contemporary challenges that governments face, including improving service delivery, the hierarchical approach has to be substituted with governing networks comprising both public and private organisations (Goldsmith & Eggers, 2004; Provan & Milward, 2001; Salamon, 2002b). As Powell (1990) argues, the normative basis for networks is in complementary strengths. As services are a joint production of multiple actors in a network, service delivery by governments is now a task of arranging and managing networks instead of managing a bureaucracy (Milward & Provan, 2003).

The network structure implies a multitude of interdependent departments and organisations (De Bruijn & Ten Heuvelhof, 2000; Powell, 1990). This situation is deemed incompatible with the hierarchical structures that government organisations are organised in. Organisations have a certain degree of autonomy and especially collaboration with the private sector requires that organisations set up agreements, match processes and make information systems interoperable beyond the confines of the (still hierarchical) domain of government. The public-private setting brings

complex interdependence, also across the boundaries between public and private organisations (Pongsiri, 2002).

1.2.2 Organisational silos and the impact of ICT

In an effort to improve service delivery to citizens and businesses, governments apply ICT to the variety of domains that governments are involved in. This is often referred to as e-government (The World Bank, 2008). Coming from a bureaucratic structure and hierarchical forms of governance and coordination, the information age has pushed many government organisations to realise an online presence, make services available online, and to electronically exchange data with other organisations. However, much of this effort has been uncoordinated, resulting in a fragmented landscape of services, information systems and organisational arrangements that are as fragmented as the (internal) organisational structure of many government agencies.

Governments are, and always have been, dependent on technology in order to carry out their core tasks, which is to shape and regulate social order (Coleman, 2008). In democratic governments, these core tasks can be subdivided into the democratic functions of government, and the administrative functions. In turn, the administrative functions can be split up in various tasks, for example the enforcement of laws and the provision of public services to citizens and businesses. The advances in ICT have a great impact on the way organisations work (Nolan, 1979) and their structure, as ICT-enabled organisations may feature less hierarchical control (Zuurmond, 1994). Literature has predicted that advances in ICT fundamentally change the way organisations interact with each other, by enabling them to connect directly (Clemons & Row, 1992; Gellman, 1996; Malone, Yates, & Benjamin, 1987). Electronic government is even regarded as facilitating a more fundamental change of the way governments function, beyond mere online service delivery, and is deemed capable of triggering a broader transformation of government (e.g. Irani, Elliman, & Jackson, 2007; OECD e-Government Studies, 2005; Weerakkody, Janssen, & Dwivedi, 2011; West, 2004).

The introduction of ICT has reinforced this fragmentation of government, creating ‘silos’ (Bannister, 2001; Layne & Lee, 2001). Siloed organisations – in isolation – built monolithic applications that support only their own functions. This does not just apply to the level of government organisations, but can also be found in the various departments within those organisations. Many e-government initiatives focus on overcoming this fragmentation in order to provide integrated services to citizens or businesses. Given the fragmented structure of many government organisations, realising such integrated service delivery is an enormous task that often starts with facilitating interactions between systems, departments, service delivery channels, and

organisations. This is both a tremendous organisational and a technical challenge, as a variety of systems have to be interconnected.

Even within organisations, integrated service delivery is a challenge due to a lack of interoperability. This challenge is even bigger as many government service delivery processes cross the boundaries of individual systems and organisations and bring interoperability issues (Scholl & Klischewski, 2007). Therefore, collaborative arrangements between multiple organisations are also receiving attention from e-government initiatives. E-government literature, for example, pays specific attention to interoperability, as ICT is not just an enabler for improving service delivery, but also a barrier. From the perspective of a service consumer, a service delivery process consists of several parts that are fragmented over multiple organisations and systems. Information is stored in multiple systems and departments have their own way of working. The challenge of dealing with this fragmentation and lack of interoperability is huge (Moon, 2002). To realise integrated government service delivery, the service providers have to deal with this problem of fragmentation in government (Scholl & Klischewski, 2007). Technical means are being developed to deal with this barrier (e.g. Service Oriented Architectures, standards like XML, Web services, etc.). Ultimately, cross-organisational integrated service delivery has to deal with vertical fragmentation (e.g. siloes and monolithic systems within organisations) and horizontal fragmentation (e.g. information and systems needed to realise integrated services are fragmented across organisational boundaries).

1.3 The problem: interdependence in public-private networks

The focus of this research is on cross-organisational integrated service delivery by public and private organisations. The idea is that the service providers relieve service consumers of the administrative burden resulting from the need to deal with multiple actors performing parts of the overall service they require. Such integrated service delivery is realised when a network of service providers performs a specific service in a coherent manner and it is perceived as integrated by service consumers. This is advantageous for service consumers, as they no longer have to provide the same information to multiple organisations, thus reducing their administrative burden. To realise this, the organisations have to collaborate and attune their activities that are part of a cross-organisational process flow.

However, integrating service delivery is difficult as many government organisations still operate in functional 'silos' and parts of the to-be-integrated service are fragmented throughout a network of autonomous actors and are supported by monolithic information systems. Therefore, integrating service delivery requires public and private service providers to increasingly work together and deal with this fragmentation, as fragmented and function-oriented organisations are not equipped to deliver integrated public services. Realising such service delivery arrangements is,

however, a very complex undertaking. Public-private service delivery requires organisations to set up agreements, orchestrate cross-organisational processes and make information systems interoperable. ICT is an important enabler of integrating service delivery, as it enables the electronic sharing of information. However, given the fragmentation and legacy of information systems, ICT is also a barrier for integration due to a lack of interoperability. The scale is perhaps best explained by an example from the RDW case, which we extensively discuss in chapter five. In 2009, in the vehicle industry alone, thousands of companies accessed the RDW's registries to change the registration of ownership of a vehicle. They did this over three million times. Furthermore, companies in the industry checked the technical state of about seven million vehicles and registered the results of these checks at the RDW registries. As a result, these two (well-used, but among many others) tasks of this network result in tens of thousands interactions a day. In 2009, the RDW provided information from its registries 666.400.000 times. As this information is used by other government agencies (e.g. the police, ministries, municipalities) and by private organisations (e.g. insurance companies and the vehicle industry), these intensive yet every-day interactions require seamless cross-organisational processes and strongly rely on ICT (figures from the annual report of the RDW, 2009).

Given the highly repetitive electronic interactions between the parties in such a network, the actors need to collaboratively execute service delivery processes and therefore overcome the fragmentation of services and systems, whilst coping with the "pluriformity" of actors in the network (De Bruijn & Ten Heuvelhof, 2007). To identify the various elements that – in the context of integrated service delivery –pose interdependence in such a network, we define a coordination lens in chapter three. This coordination lens means that we view public-private service networks as systems of interdependent elements. In such a situation of interdependence, coordination is required to realise "concerted action" (J. D. Thompson, 1967, p. 55). By coordination, we mean that "the elements in the system are somehow brought into an alignment, considered and made to act together" (G. F. Thompson, 2003, p. 37). Coordination is thus goal oriented, in this case to provide cross-organisational integrated service delivery by a network of public and private organisations.

It is in dealing with this interdependence where the challenge of providing cross-organisational service delivery through networks of public and private organisations lies. To deal with these interdependencies, we need to know what coordination needs to address in order to realise integrated service delivery by public-private service networks. The literature is clear on setting such service delivery arrangements as a the destination of current (e-) government developments, but we currently know too little of what constitutes the interdependency in the operations of such public-private service networks, of which coordination challenges arise and how these are dealt with in the coordination of public-private service networks.

The *research problem* that this research addresses is that although literature describes a development towards service delivery by networks of public and private organisations, it does not specify the interdependence that comes with such networks, and how this can be coordinated to realise integrated service delivery.

We therefore start with the main *research question:* what is the interdependence and coordination thereof in public-private service networks*?*

1.4 Research objective

The coordination of integrated service delivery has to deal with information, processes, tasks, and responsibilities that are fragmented throughout a network of public and private organisations. To integrate service delivery, organisational actors need to cooperate to ensure that an integrated response is created. Each of the organisations involved has its business processes, information registries, systems, infrastructure, and services. Integrating service delivery across organisational networks is a complex endeavour that takes place in an environment of variety of interdependent elements.

Based on the background and the research problem, the *objective of this research* is to identify what coordination needs to address in order to realise integrated service delivery by public-private service networks.

Given the discussion in this chapter, coordination does not only pertain to dealing with the interdependencies in a cross-organisational business process. As contemporary service delivery relies on the use of ICT, coordination has to deal with interdependencies between fragmented information systems and other technical elements as well (as discussed in § 1.2.2). Furthermore, a network of autonomous organisations, both public and private, collaboratively has to provide the integrated services (as discussed in § 1.2.1). Therefore, we argue that at a high level of abstraction, there are three sources of interdependence in public-private service networks:

- The organisational setting;
- The cross-agency service delivery tasks and processes, and
- Information and communication technologies.

In this research, we use these three main sources of interdependence to look for challenges in coordinating public-private service delivery, and assess the coordination mechanisms that can meet those challenges. The scientific contribution of this research is to explore interdependence in public-private service networks in order to identify the challenges in dealing with that interdependence and the mechanisms to address those coordination challenges. In chapter three, we will show that coordination theory and the literature on public-private collaboration for service

delivery do not address this issue sufficiently. Ultimately, a main contribution is an analytical framework on the coordination of a setting in which public and private organisations jointly realise operational cross-organisational service delivery processes, for which they rely on the intensive use of ICT.

As governments aim to integrate service delivery and look towards collaborating with the private sector, the societal contribution of this research is that it provides insight in the elements that have to be considered in the coordination of public-private service delivery. As such, the findings, aggregated in the coordination framework, can aid in the realisation of public-private networks, which can help improving service delivery towards businesses and citizens by integrating partial services across the boundaries of organisations and sectors.

In the next chapter, we discuss the research approach. In chapter three, the theoretical concepts introduced in this chapter are further investigated to establish which insights literature can provide pertaining to our research objective. We also explore a theoretical gap in which we find that coordination theory provides either too high-level directions for coordination, or more specific, but too narrow. After the theoretical background, two chapters will deal with the coordination challenge and mechanisms in the practice of public-private service networks. The findings from theory and practice are accumulated in a framework, which is presented in chapter six. In chapter seven, we put this framework to practice. Ultimately, conclusions are drawn in chapter eight. A more detailed overview of this dissertation is provided at the end of chapter two.

2 Research design

"Scientific discovery must ever depend upon some happy thought, of which we cannot trace the origin; - some fortunate cast of intellect, rising above all rules. No maxims can be given which inevitably lead to discovery."

- William Whewell -

The objective of this research is to study the coordination of public-private service networks. More specifically, we seek to identify coordination challenges that arise from the interdependent elements in public-private service networks, and to identify coordination mechanisms used to address them. The coordination of the interdependent elements in public-private service networks is necessary to realise integrated service delivery. However, due to the variety of actors involved, legacy and fragmented ICT, and organisational silos, it is a complex concept that has insufficiently been studied, as the development towards service delivery by networks of public and private parties is a contemporary phenomenon. This is the starting point of our research. Most research starts with such a first idea of where a problem exists (cf. Verschuren & Hartog, 2005). Whether a difference between theories, a perceived misfit between theory and practice, or based on an empirical question, both the identification of a problem and the design of a research to address this problem are products of academic creativity. As the quote of William Whewell (a 19th century English philosopher) indicates, creativity cannot be enforced. The problem identification in chapter one was a first step; the next step is to design a research that can help us to understand coordination in public-private service networks better. This chapter describes that research design.

2.1 Introduction

The literature discussed in chapter one describes a development towards cross-organisational integrated service delivery by government organisations and actors from the private sector. This poses a complex question of coordination, which does not just reside on the level of the cross-organisational process, but is also related to interdependence between organisational elements as well as technical elements in public-private service networks. In this research, our scope is the challenges that the interdependence at the level of the organisations, the processes, and the technology pose, which need to be addressed in the coordination of public-private service networks in order to realise integrated service delivery.

In the previous chapter, we have described a number of characteristics that contribute to the complexity of the research domain. These include the fragmentation

of information systems and the autonomy of organisations in the network. Public-private service networks and the coordination of interdependencies between the elements in such networks pose 'wicked' problems. That is, the problems are ill-structured, they involve stakeholders with different perspectives, and lack an optimal solution (cf. Buchanan, 1992; Lowndes & Skelcher, 1998; Rittel & Webber, 1973; Van Bueren, Klijn, & Koppenjan, 2003). We can therefore not look for general outcomes or law-like theories on dealing with the interdependencies in such networks. Even concepts such as public goals, values and the public good cannot be determined objectively and universal. In our research, we therefore need to embrace the fact that the research topic is very complex. To research coordination in public-private service networks, we need to attempt to understand the complexity of the interdependence in such networks.

2.2 Research philosophy and strategy

The coordination of public-private service networks is the topic of this scientific research. Science is the process of acquiring knowledge using a scientific method. Which scientific methods are accepted as a legitimate way of acquiring knowledge, is subject of an age-old debate. Plato believed knowledge was to be gained by intelligence and reasoning, whereas the visible realm was based on belief and illusion (Plato, 1955, p. bkVI/VII). The contemporary debate on what constitutes valid scientific knowledge often goes back to the Scottish philosopher David Hume and his argument on inductive reasoning. Hume argues that observations themselves are theoretical observations; people perceive the world from implicit background knowledge and theories (Hume, 1978). As a result, things can in reality be different from the perception of a limited number of observations. Over the course of centuries, various philosophers of science have sought criteria for demarcating between science and the realm of "pseudo-science" (Lakatos, 1973). In this respect, an influential scholar is Karl Popper, arguing that falsification should be the leading principle to make the distinction. Ideally, a scientist makes predictions and has to refute his theory if the predictions cannot stand empirical testing. If a scientist is willing to do that for a theory, the theory is considered scientific (Popper, 1968). However, in practice, scholars usually work with the implications of a theory and use certain "givens" and conduct science with a rather positive view instead of a critical one (Kuhn, 1970). Kuhn develops the idea of paradigms, which include the current body of knowledge and methods in a certain research field. These paradigms are only set aside in case of a crisis; in 'scientific revolutions' (Kuhn, 1970, p. VII/IX). Lakatos proposed the idea of scientific research programmes, with rules that aim to make scientific progress a rational process (Lakatos & Musgrave, 1970).

This line of thought is referred to as logical positivism or empiricism. At the heart of this thought is the use of methods of the natural sciences in the social sciences in an

effort to reach the level of scientific maturity of the natural sciences. Fundamental to this effort is the belief that there is such a thing as an objective reality, and that we are able – by applying the right methods – to observe this reality without influencing the phenomenon being studies.

However, the object of this study (interdependence in public-private service networks) in this research is not an object of the natural world, but of the social world, which is composed of people, structures, institutions, technologies, etc. (note that the perspectives on the nature of an object may vary (cf. Burrell & Morgan, 1979)). Consequently, we cannot hope to discover "universal theories that are the aim of the natural sciences" and have to work towards "sometimes true theories" that hold under specific conditions (Scharpf, 1997, p. 22). We consider public-private service networks as systems of interdependent elements and primarily build on the fields of organisation science and public administration. Within this field, the world consists of objects that are more subjective in nature. The organisations and organisational arrangements that are studied in this research are physical and conceptual artefacts created by people (Lee, 1991). Schutz (1954) argues that there is an essential difference between the natural world and the social world as "[t]he world of nature, as explored by the natural scientist, does not 'mean' anything to the molecules, atoms, and electrons therein. The observational field of the social scientist, however, namely the social reality, has a specific meaning and relevance structure for the human beings living, acting, and thinking therein" (Schutz, 1954, pp. 266-267). Scholars that conduct research in this field have to interpret the empirical reality in terms of how objects in the natural world (e.g. people) conceive it. For this field, an interpretive approach is legitimate and more often used in research on information systems in an organisational context (Lee, 1991; Walsham, 2006). We use the ideas of logical positivism – as discussed above – in the sense that we explicate the theoretical basis that provides the lens for the empirical research.

The nature of the topic of this research is complex and our scientific goal pertains to understanding this complexity of the coordination in public-private service networks. Therefore, the methods employed in this research have to be able to deal with this. From a positivist perspective, this would be done by developing quantitatively measurable concepts, but as the research aims to investigate the problem within the complex setting it is positioned in, a purely positivist approach cannot be applied, nor can statistical generalizability be employed to find 'truisms' on the topic (cf. Lee & Baskerville, 2003). In this domain, there are many variables, and only a limited number of cases available to us. We are therefore restricted to a limited number of available cases and an unclear coordination challenge. To understand the interdependent elements in a public-private service networks, we employ qualitative methods to get an in-depth understanding of coordination in its real-life setting, based on an interpretative research strategy to the research problem. This interpretative

approach impacts the methods used to answer the research questions, which we describe next.

2.3 Research questions and approach

In short, the goal of this research is to gain insight in the coordination of public-private service networks. This insight is needed, as literature from a variety of backgrounds together point towards the development of these networks as a different way of organising public service delivery. In chapter one, literature from various disciplines was used: literature on electronic government to describe the developments towards ICT-supported integrated service delivery; literature from public administration that argues that governments have to collaborate with the private sector; and literature on networks to describe the organisation of such collaborations. The result is a conception of public-private service networks in which public and private organisations, on an operational level, jointly provide services to service consumers. This results in many interactions between the organisations and, given the intensive use of ICT, between the information systems involved. The interdependence this brings to the every day operations of service provisioning is not (or not sufficiently) discussed in the literature describing the overall developments.

As this form of service delivery is, both in literature and practice, expected to become more important now and in the future, this research aims to address the knowledge gap by researching what coordination is in these public-private service networks. As this is a contemporary phenomenon, the options for investigating the phenomenon are limited, but it is also important to investigate this now. Therefore, this research is explorative in nature. To realise the goal of this research, we will address the research problem through answering four research questions. Multiple research steps, employing various methods, answer these research questions. These steps are:

- Literature survey;
- Two case studies, one on a starting case and one on a mature case;
- Aggregating the results of these steps in a framework; and
- Putting this framework to practice.

We discuss each of these steps, and the questions they answer, in turn.

2.3.1 Step one: literature survey

In chapter one, we argued that contemporary literature on the provisioning of public services points at the rise of public-private service networks. However, the interdependence between the elements in such networks poses a complex coordination challenge. Being an introduction, the core concepts are only discussed briefly in chapter one. These concepts need further elaboration, based on academic literature available. Therefore, we trace the background of public-private service

networks in literature on electronic government, public administration, public-private collaboration, and networks.

This first step of the research was done by conducting a survey of literature concerning the core topics of this study as identified in chapter one, to wit: the developments in (electronic) public service delivery and the collaboration between public and private organisations in networks. Based on this literature, we define core concepts of this study such as interdependence, public-private service networks, and coordination. This results in a specification of public-private service networks, based on academic literature. This is necessary as we argue that such networks are a way of providing integrated service delivery, related to, but different from public-private collaboration in general.

As we take a coordination lens to view public-private service networks, we also explore the other core topic of this dissertation: the theoretical perspective on the coordination of the interdependence resulting from this way of providing services. The literature therefore both provides the theoretical background of this study and illustrates the gap in literature on coordination, which is addressed in the empirical phase of this research.

We used Google Scholar and Scopus to search for literature on the key concepts: coordination, public service delivery, e-government, public-private collaboration, and networks. We primarily encountered literature from the domains or fields of public administration, organisation science, e-government and coordination theory. We focus on the literature that contributes to our understanding of how public and private organisations provide public services and how to deal with the interdependence that comes with such arrangements. As in the rest of this study, the societal effect (improving public service delivery) is thus leading in the literature survey. The result from this literature study is insight in the three pillars of this study – public-private collaboration, networks, and coordination – from various domains and disciplines. This study is *inter*disciplinary, as our view is composed from various backgrounds, and not so much multidisciplinary, which refers to assessing a phenomenon from the perspective of multiple disciplines (e.g. to compare results between the disciplines). In our composed view, the various backgrounds are still present, but all are used to approach the empirical material and to assess coordination in that material.

The literature study can roughly be divided in two components: one detailing public-private service networks and one detailing interdependency and coordination. The first is composed of literature from a variety of backgrounds (as a search for the phrase “public-private service networks” in Google Scholar only yielded eight results by other authors). In the theoretical background, we also look for general sources of interdependence. This results in a number of challenges or potential hurdles that have

to be kept in mind in the coordination of public-private service networks. In our review of the concept of coordination, we assessed in how far coordination theory is able to deal with those challenges. We found that coordination views are either too high-level or too narrow to identify all interdependent elements that require coordination in public-private service networks.

As we define coordination in terms of interdependent elements, the first research question is therefore the following:

***RQ 1**: Which elements of interdependence are useful to assess coordination in public-private service networks?*

Based on the literature review and the theoretical gap, we find that although coordination theory often looks at activities and resources in a process as the main interdependent elements, also organisations and information systems are main sources of interdependence in public-private service networks. We used these three main elements of interdependence (organisations, processes, technology) also in the introduction in chapter one, and further used them to structure our description of the empirical chapters. We regard these elements as a sort of black box and focus on the interdependencies between them. This enabled us to unravel the coordination of public-private service networks.

2.3.2 Step two: case study strategy

In the literature we discuss, a range of theories and studies on public-private collaboration in networks is provided. The broad range of literature shows that to achieve concerted action, a complex set of interdependencies requires coordination. Therefore, as a next step we investigate the empirical side of public-private service networks. In the description we use three layers:

- The organisational setting;
- The cross-agency service delivery tasks and processes, and
- Information and communication technologies.

Given the explorative character of this research, it is important to note that in the empirical work of this research we did not limit ourselves to the terms of these three main elements. In other words, they were not used as a given in the research, but are used to structure the description of the cases in this dissertation. In each study, we assessed the usability of these three elements to assess the coordination in public-private service networks. In the chapters to come, we illustrate that these layers are useful in general, but also that more detail is needed, as represented in the nine sub layers present in the framework.

As this research focuses on a contemporary phenomenon, which we study within a real life context, case study research is the suitable strategy (Yin, 2009). We study two

case studies, in two phases. These cases are distinct (and thus not used in comparison), as in the first we aim to explore the complexity of the coordination challenges encountered in a public-private service network still under development. In the second case, we study a mature service network to explore how they deal with the interdependence; in other words: how they coordinate.

Per case, the background and context is provided, illustrating the complexity. Furthermore, a description of the actors, a systematic analysis of the topic (coordination challenge in the first study, coordination mechanisms in the second) in the case and conclusions are described. Within the cases, the main method used is interviewing. Interviews in the second empirical phase are semi-structured; the interview protocol is provided in appendix A. Given the explorative nature of the first case study, the in-depth interviews in that study were governed by the topic and not further structured. Within-case evaluation is a second method, performed by expert reviews and workshops with service delivery experts, academia and consultancy.

The goal of the case studies is to explore coordination challenges and mechanisms in public-private service networks in their real world complexity. Therefore, we optimised the understanding of the cases (rather than generalisation beyond the cases) as the cases are of interest to the topic by themselves (Stake, 2000). The insights in the coordination of the networks gained in the study are reported in chapters four and five. As we aim to work with the complexity of the case, we do not present the interview data itself, but the aggregated insights. In this respect, it is important to note that the case studies were performed as part of research projects (performed and supported by various organisations with backgrounds from academia, business and government). The aggregated results and reports that were based on the case studies were checked by the participating organisations, resulting in a first validation of the results and findings of the case studies by representatives of the organisations under study themselves.

2.3.2.1 Explorative study of a case in development

In the first case study, discussed in chapter four, we explore the coordination challenges in a feasibility study on an electronic portal that provides demand-driven electronic services to citizens by a network of public and private organisations. This exploration of coordination challenges answers research question two:

***RQ 2**: What are the coordination challenges in a public-private service network?*

In the exploration of coordination challenges, we found a total of twelve coordination challenges in this case. In this dissertation, these twelve coordination challenges were grouped in terms of the three high level elements mentioned above. In the study itself, we started without this structure, to capture as much of the complexity as possible. We found the coordination challenges rising from the interdependencies that came up

in the development of the portal in this study. To clarify the relationships between the elements and the coordination challenges by an example: organisations are high-level interdependent elements, making these organisations act together has to deal with challenges such as the autonomy of the actors and potentially varying goals; these are the coordination challenges. In this section, we discuss the background of this study.

This first case study is an explorative case study into the challenge of coordinating public-private service networks. In an attempt to stay as close as possible to our theoretical 'ideal' model of public-private service networks, we investigated the coordination challenges in such networks in a research and development project aimed to demonstrate the possibilities and challenges of an electronic portal for demand-driven public service delivery, offered by a network of both public and private organisations. As this was a case under development, we consider this a case in the starting phase, which offered the opportunity to explore coordination challenges encountered in the development of electronic public-private service delivery.

The starting point of the project was that several large government agencies and private organisations in the Netherlands observed that government services should be based on actual service consumer demand and that cooperation is necessary to meet those demands (Lankhorst & Derks, 2007). Demand driven e-government service delivery requires an integrated approach of technical and organisational issues, leading to the creation of "virtual agencies" (Fountain, 2001a). This observation resulted in a joint research initiative with partners from government, academia and business. The project aims at establishing requirements and solutions for public-private service networks that provide integrated, demand-driven electronic services. Private parties complete the public sector service offerings to facilitate the service demand and process of the service consumer.

To achieve its goals, the project resulted in circa 50 deliverables, in four general categories: prototype e-services, insight in user experience, functional specifications, and answers to design issues, all related to the concept of an electronic portal for demand-driven and integrated service delivery. The project consortium consisted of:

- Three of the largest executive government organisations in the Netherlands;
- A frontrunner municipality;
- A commercial organisation (as part of steering committee);
- The ICT executive organisation of the Dutch government;
- An applied research centre;
- Two Dutch universities.

In total, 30 researchers and experts from these organisations were active during the period we participated in this research project, in 2007. During this period, the

project consortium developed two scenarios for demand-driven e-service delivery. These scenarios were co-developed by researchers and experts from the organisations that play a role in the scenarios. The scenarios served as a setting in which the research took place. For both scenarios, we looked into the interdependencies that arise in the realisation of the envisaged service delivery model. We learned those interdependencies from extensive (open) interviews and meetings with both experts from the organisations involved and with researchers working on other topics (within the same scenarios). To provide an example of the latter: the researchers working on the functional specifications were able to provide valuable insight in the coordination challenges that they encountered in their work on the matter.

As we worked with (artificial) scenarios, we regularly presented and discussed our thoughts and findings with experts and practitioners in plenary sessions with the project consortium and other representatives from the organisations involved. In these expert meetings, we actively sought validation of our assessment of the coordination issue and the coordination challenges we found in the study. These sessions took place in 2007 on May 30th, September 20th, December 13th, and December 14th. In the last session, we discussed the realism and applicability of our research in a broader sense with circa 30 people working on e-government issues at the strategy level in public organisations in The Netherlands. As such, this session was profoundly more strategic in character.

2.3.2.2 Case study of a mature case

Through the answers on research questions one and two, we gained a broad understanding of the 'what' in coordination (i.e. what needs coordination). The next step is to investigate the 'how'. We therefore study which coordination mechanisms are employed in practice.

***RQ 3**: How is a public-private service network coordinated in practice?*

As this is essentially a *how to* question (i.e. how to coordinate), we conducted a case study on a Dutch public-private service network that is considered a good practice of such a model for service delivery. The case was the best match to our concept of a public-private service network we found in The Netherlands. As this is only one study, with coordination mechanisms specific for the context of this study, we also conducted a series of in-depth interviews to elicit the views of experts and practitioners on the coordination strategies they find in practice. Both are discussed in chapter five.

Interview series

As there is lack of cases that fit our ideal-type of public-private service networks, there are few suitable cases to investigate the topic as a whole. Since developments in theory and practice hint at a rise of such forms of service delivery, we interviewed a series of experts and practitioners on coordination in their situation, in which we always focus on cross-organisational integrated service delivery. Although most of these situations should not be considered full public-private service networks, the interviews do provide valuable insights on the coordination strategies that are employed in multi-organisational arrangements. As such, they provide an overview of the range of coordination mechanisms used in practice. It sets the stage for the RDW case study, in which we find a comprehensive coordination approach, but as it is a single case study only, it does not provide an overview of the breadth of the coordination strategies available for public-private service networks.

Most of the interviews are situated in the Netherlands to control for historical and cultural differences. We have spoken to a total of 20 people in the second half of 2007 and the first half of 2008, including people from five government agencies in The Netherlands. We have also interviewed representatives from three government agencies (in total) from Belgium and Canada. We selected people from Belgium and Canada to gain insight in cross-agency coordination in a federal system, whereas The Netherlands is a (decentralised) unitary state. Some of the findings are corroborated with document analysis. The interviews were semi-structured and the interview protocol is provided in appendix A.

RDW case

As a result from the explorative case study in step one, we have an understanding of the coordination challenges in public-private service networks. The next step is to investigate how coordination is achieved in such a situation. In chapter three we define coordination mechanism as a set of methods to provide tools for managing interdependence. To understand the entirety of that set, we analysed the RDW case, which is internationally recognised as having realised efficiency gains and improved service delivery through an ICT-enabled public-private service delivery model (e.g. Undheim & Blakemore, 2007). For this case study, we have interviewed employees of the RDW (including the directors), representatives of the sector associations of businesses in the motor vehicle industry (BOVAG), and an independent expert. We corroborated our results with document analysis on studies that included the RDW (Millard, Svava Iversen, Kubicek, Westholm, & Cimander, 2004; Programma Architectuur Elektronische Overheid, 2005; Undheim & Blakemore, 2007) as well as factual documents from the RDW itself and from the Dutch Government. Ultimately, the case study report was fact-checked by representatives of the RDW.

This case study was more structured than the first case study, but remains explorative in nature. In this step, we sought insight in the complexity of the actual coordination

of a service network that matches our idea of intensive public-private collaboration for service delivery, supported by ICT. The strategy applied here is that of case-study research, as it provides an understanding of how to coordinate a public-private service network (Stake, 2000; Yin, 2009). Using semi-structured interviewing as the main method, we thoroughly investigated the coordination mechanisms employed in this case, to gain an in-depth understanding of coordination in the real-life context. To structure our description, we use the same multi-layer view that is used in the first case study. We also use the RDW case to assess whether this layered perspective on interdependence adds value in looking at coordination mechanisms. We explicitly discuss the complexity of the RDW network in § 5.2.2, where also a limitation of this study is presented in the sense that the RDW case exists in a relatively stable domain, whereas other public-private service networks may face a more dynamic environment (De Bruijn & Ten Heuvelhof, 2007).

Together, the interview series and the RDW case provide an answer to RQ3. Therefore, both are reported in the same chapter: chapter five.

2.3.2.3 Validity

Validity is both important and difficult to achieve in a study of this nature (Landsheer, 't Hart, De Goede, & Van Dijk, 2003; Yin, 2009). We therefore discuss how we addressed validity concerns in this study.

In the case studies, content validity is important. Therefore we define our concepts in chapter three, based on theory. To ensure that all people included in this study are on the same page concerning these concepts, we regularly presented our concepts and intermediate findings to experts in the research projects. Furthermore, we send case reports and analysis to the interviewees and asked them whether everything was correct and clear. Also, we have case description of the RDW checked. The respondents checked all individual reports (containing the aggregated description and findings of the case studies) to ensure that they share our understanding of the key concepts. As such, experts from practice assess whether our understanding of the matter has reference in their real world practice. Finally, the scientific articles that draw on the research projects were all sent to the project management committee and steering group for validation before publication.

External validity is in this research addressed by using theory as a basis of our approach to case studies, and by being explicit on the research steps. Note that we do not seek statistical generalizability (i.e. generalizing to samples and universes). We study this for the interest in the cases itself, as literature describes a development towards more integrated service delivery by public and private organisations. The external validity is therefore primarily related to this development. Note that both are subjective forms of validity.

External validity may be threatened by the fact that we do not replicate each case study in different situations. This is, however, not possible due to a lack of suitable cases at the time. We seek to address the issue of external validity by specifying the logic between the research steps and by aggregating the results of the literature study and case studies in a framework. The organisations and collaborations involved in the case studies could perhaps be considered "exhibitionist" (Cook & Campbell, 1979, p. 73), as these organisations are looking to improve service delivery and could be considered best practices or frontrunners. This might especially be the case for the RDW and the municipalities involved in the case studies, the interview series, and the game (discussed next). However, the fact that most of the Dutch large executive public organisations were involved in either one or both case studies, or in the interview series mitigates this threat. Still, it is important to recognise that public-private service networks are still in their infancy and that even with a better understanding of the interdependence that exists in such networks, more 'conservative' organisations may still take a long time to actively provide service through public-private service networks, if they will ever.

2.3.3 Step three: a framework

The results from the case studies and the interview series are used to formulate a framework for coordinating public-private service networks. This is discussed in chapter six. This framework represents a key contribution of this research. The framework is aimed to fill the gap between the envisaged development of integrated service delivery by public and private organisations and the lack of insight in the coordination of such a network. The research question related to this consists of two parts; the first is on proposing an analytical framework of coordination in the context of ICT-enabled public-private service delivery.

***RQ 4a**: What framework can unravel the complexity of the interdependence in public-private service networks?*

The framework aggregates the findings of the case studies and incorporates the lessons from the theoretical background. The framework thus reflects both literature and the aggregated findings from the case studies and interview series.

This aggregation took place through a number of iterations. In the first case study, we started with a number of coordination challenges brought forward by the interdependencies in the portal. Within the case study, these coordination challenges were refined through the interactions with the experts involved in the project and ultimately twelve remained, which are presented in the findings section of chapter four (§ 4.4). In the presentation of this dissertation, these were grouped over the three high level interdependent elements (organisations, processes, information systems), as this addressed the theoretical gap. One of the findings that stood out was

that data has challenges of its own and is therefore made explicit since. Furthermore, the findings from the RDW case study were used to further refine the on-going development of the multi-layered approach to assessing coordination in public-private service networks, which is represented by the framework. In chapter six, this framework is presented, along with a consolidation of the service delivery developments found in the case studies. After the presentation of the framework, the main elements of the framework are discussed in detail. They provide the background of the framework, which is a result of the process. It is there (§ 6.3) that the basis of processing of the findings from theory and case studies into the framework is made explicit.

The cases show that a high-level or narrow view on coordination does not respect the complexity of coordination in public-private service networks. The framework provides an analytical tool to unravel the interdependence and take the various elements of interdependence and coordination challenges and mechanisms found in the cases into account.

2.3.4 Step four: putting it to practice

Building on to the findings in chapters three, four and five, we described a coordination framework in chapter six. This framework is an answer to the first part of research question four and unravels the interdependence and coordination in public-private service networks.

***RQ 4b**: What insights are gained when using the framework to unravel coordination?*

As the fourth and last step of the research, we put this framework to practice to evaluate the insights gained by it. For this, we describe two archetypical situations that reflect the extreme ends of coordination, unravelled by using the framework. These two archetypical situations are put to practice. We do this in two steps. First, we introduce coordination challenges in a simulation game to assess the usefulness of the framework. Second, we put to practice the proposition, made in chapter six, that the layers are interwoven. We do this in a demonstrator of an event-driven service-oriented architecture. Taken together, these two steps are used to evaluate how the framework can be used to analyse why coordination goes wrong (in the game) and how it can be used to develop solutions for specific coordination problems (in the demonstrator). Both are presented in chapter seven.

2.3.4.1 Simulation role-play game

In an intervention in the real world of public service delivery is not feasible, we used a simulation game that mimics the essence of a real world situation in which a government organisation and a third party offer integrated services to citizens. In a game, human participants play a role in an artificial setting, which models (a part of)

reality (S. Meijer, 2009). To ensure that the results have real world validity, the design of the game must simulate the core characteristics of a real world situation (Duke, 1980; S. Meijer, 2009). Such an approach to assess coordination in a complex situation has been used before (Bharosa, 2011).

A simulation game is a meaningful instrument to assess the usefulness of our coordination framework, as it features a controlled environment in which relevant actors use their expertise to deal with the interdependencies and coordination challenges they encounter. Furthermore, the players ultimately create a shared understanding of the issue of coordination in public-private service networks. The underlying idea is that although we cannot experiment with the coordination framework in a real world situation, we can use real world actors in a setting that simulates the core characteristics of the system of interdependencies.

We use the game to reflect on our framework based on our observations of five game sessions, including an evaluation round with the participants. In this evaluation round, the participants reflected on their own session through the coordination framework. Furthermore, the participants also reflected on the coordination framework itself. Consequently, there were over 60 participants, with a shared understanding of the problem of interdependence in service delivery, that assess the value and applicability of the framework.

2.3.4.2 Technical demonstrator

In the second stage of putting the framework to practice, we build on to a scenario that was researched in the first case study. In that scenario, we found that the process flow has a reciprocal character and a low predictability of the line of action. This requires a coordination of the technical interdependence in such a way that it is sufficiently loosely coupled to enable a variation in process flows. We use the framework to see if and how an event-driven service oriented architecture can be used to accommodate such a process flow, whilst at the same time also addressing the coordination challenges on the other layers, such as dealing with the autonomy of the organisations that have to perform parts of the process.

In this way, we use the framework to unravel the interdependence that exist in such a complicated process flow and use this to come to a coordination mechanism that deals with the coordination challenges coming from all three layers.

2.3.4.3 Validity

Apart from the validity discussion on the case studies, the recognisability of the game as an artificial setting also poses a validity concern, related to ecological validity (Landsheer, et al., 2003). The game and the demonstrator put the framework to practice to evaluate its use in a 'typical' setting of integrated service delivery, where

the game starts from the organisational side, and the demonstrator from the technical side. Given the research design, this does not lead to empirically validated and generalizable results. However, it provides a way to assess whether the framework can be used to handle the complexity of the coordination issue in public-private service networks beyond the explorative research that the framework is based on.

Within the game sessions, we presented the framework to all participants and asked them to reflect on it. The results of this are discussed in chapter seven. In brief, the participants indicated that they found the framework insightful as it shows the breadth of coordination and represents that interdependence between elements are not limited to the same type of elements (e.g. that the coordination of technical interdependencies is related to organisational interdependence). However, as this was a group assessment of the framework, potential dissonant opinions may not have been voiced. The same limitation applies to the technical demonstrator, which was assessed by an expert group.

Furthermore, the design of the game itself is subject to the same validity question. To address this, we based the game design on a scenario based on actual service delivery processes. The realism of this scenario was discussed beforehand with a small team of the organisation playing the game. However, as the game is an abstraction of reality and variations between sessions is very limited, the implications to the daily practice of the participants need to be actively discussed after playing the game. These forms of validity are subjective.

2.4 Overview of the dissertation

Figure 2 shows a schematic overview of this dissertation. It illustrates that the answers to research questions one, two and three provide the basis for the coordination framework that is the answer to research question four. Furthermore, it shows that the theoretical problem (identified in chapter three) forms the basis for the conclusions, together with the findings from the coordination model and its evaluation in a game and a demonstrator. This illustrates that the conclusions are thus a confrontation between the theoretical background and the empirical findings.

The two short arrows reflect that the theoretical background directs the empirical studies in the sense that each empirical study is conducted through a coordination lens, described in chapter three, and described and analysed on three layers: the organisational setting, the cross-organisational process, and the information and technology layer. The figure does not show that the research questions also represent sequential steps that impact each other; the answer to research question one impacts the coordination challenges we found, which in turn impacts the coordination mechanisms that we identified to address those challenges. The coordination

framework thus also benefits from the combination of these steps, as well as from the individual results.

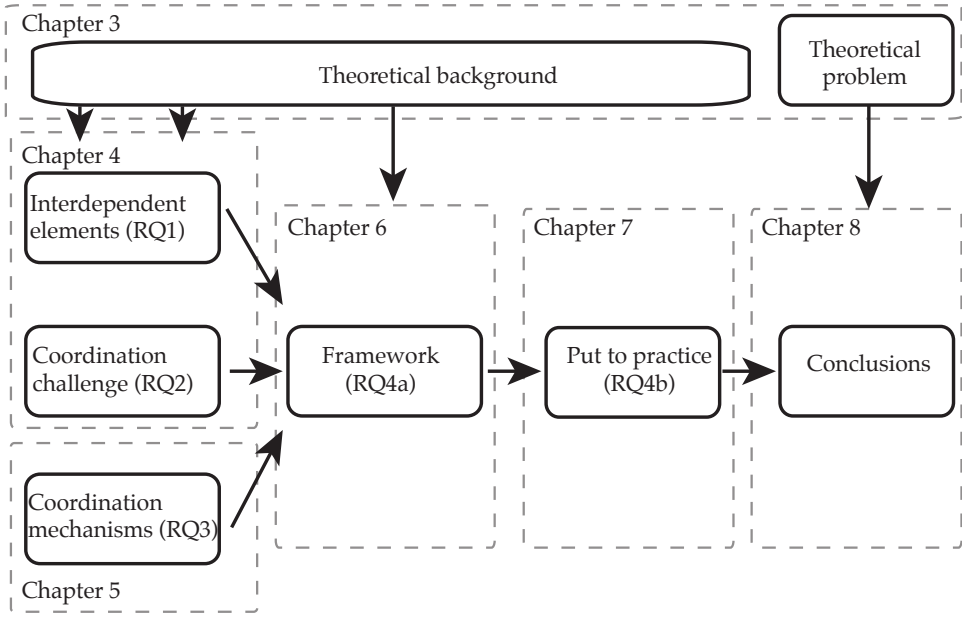

Figure 2: **schematic overview of this dissertation**

3 Theoretical background

"The philosophy of the school room in one generation will be the philosophy of government in the next"

- attributed to Abraham Lincoln (disputed) -

In the introductory chapter we described developments in public service delivery towards a model in which networks comprising public and private organisations offer public services in an integrated manner. By integrated we mean that service providers deal with the cross-organisational aspect of service delivery processes, thereby relieving the service consumer of the burden of orchestrating all the parties involved. As a result, the interdependencies that exist in such networks have to be dealt with by the organisations in the network. Managing these dependencies poses a coordination problem. This coordination task is complex and requires a better understanding of the interdependency and coordination in public-private service networks.

In this chapter, we survey existing literature on the core concepts of this study: public service delivery, the collaboration with private actors in networks, and the concepts of interdependence and coordination. This chapter can roughly be divided in two parts: one in which the background of public-private service networks is discussed, and one in which the concept of coordination is presented.

As public-private service delivery has not yet received much research attention, we trace the concept back to a debate on the management of the public sector. Furthermore, we combine this public sector reform literature with literature on developments in ICT in government (i.e. electronic government) and borrow from other – affiliated themes – such as some literature on organisations and information systems. As a result, we adopt a view on developments in public service delivery strongly rooted in both literature on the public sector and the role of private parties and in literature on the role of ICT-enabled public service delivery. Furthermore, we combine this ICT-enabled public-private service view, with literature on networks as a form of organising.

The result is a view in which organisational issues among public organisations and between the public and the private sector are present, but also a view on the information systems and other electronic support that these actors use to perform their tasks. To bring all of those on the same level, we view a public-private service network as a system of interdependent elements. To realise service delivery, these elements have to be considered and made to act together. Viewing a public-private service network as a system of interdependent elements comes from using coordination theory as a lens. In our assessment of coordination theory, we also look

at the concept of interdependence and the coordination mechanisms available. Based on this, we identify the theoretical problem this research addresses. Parts of this chapter have been published in, or are based on: (Klievink, Derks, & Janssen, 2008; Klievink & Janssen, 2009b; Klievink, Van Veenstra, & Janssen, 2009).

3.1 Public service delivery

With more and more dependencies, society is becoming ever more complex. When actors want to achieve anything, they find that there are multiple actors with various interests that are dependent on each other to achieve their goals (De Bruijn & Ten Heuvelhof, 2007). The problems that (government) organisations face are more complex than before as the act of governing also has to deal with such interdependencies because most acts of government transcend organisational boundaries. As we have seen in chapter one, this also includes the boundaries between the public and the private sector. Goldsmith and Eggers (2004) argue that in order to meet these changes, governance is shifting from using traditional bureaucratic structures to an increased reliance on partnerships and the use of organisations outside the government to perform public tasks, a development they call "governing by network" (Goldsmith & Eggers, 2004, p. 7). The importance of network forms of organisation are traced to trends that are also included in this study: the use of third parties, the integration of services, advances in ICT and increased citizen demands (Goldsmith & Eggers, 2004). These trends can often be traced back to public sector reform and the public management practices they are a response to. By public management or public administration, we mean the "activity of public servants" and the "structures and processes of executive government" (Pollitt & Bouckaert, 2004, p. 13).

Before going into the details of forms of government in which the boundaries between the public and the private sector blur, we will provide a short introduction on the discussion about public-sector reform that has shaped the various perspectives on public-private collaboration that we are dealing with now. In this section, we first discuss traditional ('Weberian') bureaucracy, to which much reform thinking is a reaction. Second, we discuss the New Public Management (NPM), a major public sector reform movement and a basis for the idea of the use of third parties in the activities of government. Third, we discuss electronic government; to discuss both the trends of the advances in ICT and the way this is used by governments to meet changing citizen demands by facilitating integrated service delivery. Finally, we discuss contemporary thinking in public sector reform, which goes beyond NPMs distinction of public versus private and discusses collaboration between the sectors to realise public goals.

3.1.1 Weberian bureaucracy

Developments in the functioning of the public sector are often set against a background of bureaucracy. The popular understanding of bureaucracy is that of inefficiency; very formalised, a lot of paperwork and limited results (for an extensive overview and discussion of the wide variety of conceptualisations of bureaucracy, see Albrow, 1970). Zuurmond argues that bureaucratisation is a continuous process that is part of a rationalisation- or modernisation process in which increasingly more parts of society become subject to governance and control (Zuurmond, 1994). Max Weber (1947) sees bureaucracy as an instrument or system of governance in the ideal-type of a rational legal bureaucracy. This type of organisation is characterized by having (Ho, 2002; Pieterson, 2009; Pollitt & Bouckaert, 2004; Weber, 1947):

- Fixed spheres of competence;
- A defined hierarchy;
- A clear distinction between public and private roles;
- Specialisation;
- Departmentalisation, and;
- Standardisation.

Among the key advantages of the (Weberian) bureaucracy is the reduction of transactions costs through departmentalisation and routinisation (Ho, 2002; Williamson, 1975) which reduce uncertainty and thereby the coordination costs (Galbraith, 1974). Furthermore, bureaucracies are less prone to error, fraud, negligence, and opportunism (Ho, 2002).

Christopher Pollitt and Geert Bouckaert (2004) – in their work on public sector reform – argue that this "ancien régime" (p. 61) is what reform efforts are claiming to be improving. However, the "traditional bureaucracy" is first of all not a single system. Various forms can be found in history and in different sectors of the public sector, such as "bureau-professionalism" in expensive and labour-intensive sectors such as health care (Pollitt & Bouckaert, 2004). Furthermore, while the complaint of rigidity and inefficiency of bureaucracies may be valid, reform proponents tend to ignore the positives, such as the ones mentioned above and – perhaps more important – "continuity, honesty, and a high commitment to equity in dealing with the citizen-public" (Pollitt & Bouckaert, 2004, p. 62). These bureaucratic characteristics may be in danger in reforms such as the New Public Management (Pollitt & Bouckaert, 2004).

3.1.2 New Public Management

The New Public Management (NPM) is one of the most dominant movements in public sector reform, with the ambition of overcoming the problems of traditional bureaucracy by learning from the private sector. In short, it often refers to the use of business methods in public sector management, reporting, and accounting (Dunleavy

& Hood, 1994). When it comes to the interactions with citizens and businesses, governments are expected to behave more like private organisations and think of delivering services to 'customers'. Businesses are generally regarded as more innovative and customer-friendly, whereas governmental organisations have long neglected the citizen's perspective on their services and products.

The ideas of the NPM is voiced particularly strong by Osborne and Gaebler (1992) (the title of their book says it all; "Reinventing Government"). They state that "[t]he greatest irritant most people experience in their dealings with government is the arrogance of the bureaucracy. People today expect to be valued as customers – even by government" (Osborne & Gaebler, 1992, p. 167). In other words: governments should address their citizens in a way similar to how businesses address their customers. Citizens should feel as a valued customer in their dealings with government. Other aspects of the way that businesses work are seen as a reference model for improving governmental efficiency and effectiveness. The idea is that government organisations are managed as an enterprise, using business-, and organisational models and methods. Budgets, planning and control cycles and performance contracts are examples of such methods (Ter Bogt, 2002).

Among the key features of NPM are:

- The public sector should be interested in the process of governing and not in the structure of government ("steering" rather than "rowing") (e.g. Beynon-Davies, 2007; Osborne & Gaebler, 1992), linked with:
- A shift towards privatisation and "quasi-privatisation" (Hood, 1991, p. 3);
- Move from administration to management (e.g. Beynon-Davies, 2007; Dunleavy & Hood, 1994);
- Competition in the public sector (e.g. Dunleavy, et al., 2006);
- Citizens are viewed as customers of service delivery (e.g. Beynon-Davies, 2007; Bourgon, 2007; Osborne & Gaebler, 1992).

NPM based reform is rooted in a critique of traditional bureaucracy that is fairly typical for the "Anglo-American-Australasian" world, according to Pollitt and Bouckaert (2004, p. 61). Osborne and Gaebler (1992) hold the thesis that the 'traditional' public management should be replaced by the 'new' public management because "[h]ierarchical, centralized bureaucracies designed in the 1930s or 1940s simply do not function well in the rapidly changing, information-rich, knowledge-intensive society and economy of the 1990s" (Osborne & Gaebler, 1992, p. 12).

NPM has been strong especially in the Anglo-Saxon world, initially with programmes in New Zealand and the United Kingdom, and later also in the United States. There is also a significant role for NPM thinking in modernisation agendas, such as those in the U.K. (Great Britain Cabinet Office, 1999). The managerial approach is not necessarily rooted in a global process, but may be a nation's answer to its specific circumstances

(Clarke & Newman, 1997). The reforms in New Zealand were most dramatic. According to Elaine Kamarck, "government reform seemed to have outstripped lamb as the most popular New Zealand export" (Kamarck, 2007, p. 7). Much (U.S. based) work on innovations and developments in government are based on the idea of "creating a government that works better and costs less" (title of status reports of the National Performance Review, see: Gore, 1994) (e.g. Fountain, 2001a; Goldsmith & Eggers, 2004; Kamarck, 2007).

As ICT is also seen as a means to improve public service delivery and to increase efficiency in government, the use of ICT in public service delivery is seen as a 'megatrend' linked with NPM (Hood, 1991). In a broader sense, ICT is seen as an enabler or facilitator of public sector reform (Bekkers, et al., 2005; Cordella, 2007; Heeks, 1999).

The general idea of improving public service delivery and – indeed – the efficiency and effectiveness of all public sector procedures and management, can be found in many of today's (e-) government efforts to enhance the functioning of the public sector, also in The Netherlands (e.g. the "Andere Overheid" (Different Government) programme in 2004; a programme aimed to improve (ICT-enabled) services and reduce costs).

3.1.3 Electronic government

In their effort to improve the efficiency and effectiveness of service delivery to citizens and businesses, governments apply Information and Communication Technologies (ICT) to the variety of domains that governments are involved in. This is often referred to as electronic government or e-government (eGov) for short (e.g. The World Bank, 2008). In the United States, the term Digital Government (DG) is often used to describe the same phenomenon. The DG concept is sometimes used more inclusive by also including e-democracy aspects, but often the terms are used interchangeably (e.g. Chen et al., 2008; Scholl, 2008).

In many countries, governments aim to improve service delivery to citizens and businesses, displaying a higher level of responsiveness in a dynamic and continuously changing environment (Chen, 2003). Advances in ICT have been used by government organisations at all levels to improve their internal operations and service levels in order to create new, better and more effective service delivery and to improve the efficiency of government activities (Andersen & Henriksen, 2006; Layne & Lee, 2001).

Apart from improving service delivery and other public sector activities, e-government is also seen as capable of realising democratic goals, such as improving transparency and democratic accountability (e.g. A. Meijer, 2009; West, 2004). Darrell M. West, for example, emphasises a need for integrated and executable electronic services, but for him, the use of ICT in government should realise an interactive

democracy; "beyond a service-delivery model to systemwide political transformation" (West, 2004, p. 17). Andersen and Henriksen (2006) also hint at improved accountability by opening up more information. Sophisticated features can boost democratic responsiveness and leadership accountability (West, 2004), and an increased "social value" of e-government (Irani, et al., 2007, p. 333). A strategic vision on the use of IT is required, since this fundamentally impacts the way governments function, not only with regard to their current processes and systems, but the entire way governments interact with their constituents, including changes in democratic processes and participatory functionalities (Moon, 2002; West, 2004). As we focus on public service delivery to service consumers, we do not further focus on the use of ICT in policymaking and democratic processes.

When it comes to service delivery, there is a shift in thinking from the provision of static supply-side prescribed and controlled functioning towards providing a service towards another entity (e.g. a citizen, or a system or business process in the technical domain), in which the request or demands of the service consumer plays a leading role. For e-government, this evolution of government efforts to provide electronic services and improve service delivery is often denoted a stage-wise progression (e.g. Layne & Lee, 2001; Moon, 2002; U.N., 2002). The aim of evolutionary models is to break down organisation development into a series of discrete stages, with development moving from one stage to the next (Nolan, 1979). Stage models are also used in other domains, such as e-commerce (e.g. Ghasemzadeh & Sahafi, 2003; Greiner, 1972; Rao, Metts, & Monge, 2003). A number of authors acknowledge that stages are conceptual and the actual development may follow a less linear path. Generally, with regard to service delivery, two main challenges can be identified from stage model literature: the fragmentation within organisations, and the integration of services across organisations. We discuss both in turn.

3.1.3.1 Functional siloes and integration within organisations

Most stage models focus on the developments in terms of service delivery, and start their model with the developments of a web presence (U.N., 2002), which is at first only used as a "billboard" (West, 2004, p. 17) to publish government information on the web (Layne & Lee, 2001). This is too limited a view, as the developments within the organisation has often started before the emergence of an online presence, and still has major implications for the challenges that organisations face today (Klievink & Janssen, 2009b). The result of the implementation of ICT systems in Weberian bureaucratic structures has resulted in an inflexible situation with fragmented silos, based on monolithic systems (e.g. Bannister, 2001). To carry out different tasks or processes, organisations make use of different systems that have been developed independently by different departments within the organisation. In some cases, these

various departments store the same data in different applications and the systems involved are not connected or synchronized.

One of the e-government stage models that is most referred to is the one described by Layne and Lee (2001). They identify four stages of e-government development: cataloguing, transaction, vertical integration and horizontal integration. The stages are placed upon two dimensions; (1) the technological and organisational complexity on a scale from simple to complex, and (2) the level of integration, ranging from sparse to complete (Layne & Lee, 2001). The idea is that governments start their e-government development in creating an online presence by offering information and downloadable forms on the web. After this, governments start to support transactions via the online channel. West (2004) says that this is where citizens can get partial service delivery. The United Nations identify detailed steps in between; an enhanced presence, followed by a stage of interactive and later also transactional presence (U.N., 2002). The transactional feature thus emphases two-way communication (Moon, 2002). As part of the third stage, organisations link various systems vertically to integrate services within a specific function. Finally, systems are integrated across functions and thereby create a one-stop-shop (Layne & Lee, 2001). The issue of fragmented siloes within an organisation is thus not dealt with until the highest stage of development. Andersen and Henriksen (2006) argue that the model suggested by Layne and Lee reinforces the technological bias pushed by organisations that promote e-government and argue that organisations should move beyond the economics-of-scale benefits and focus more on streamlining processes and improving communications with service consumers.

The result of the automation of fragmented departments for e-government service delivery is that the online presence is often a set of webpages provided by different departments, on different – but sometimes overlapping – topics. Service consumers are expected to find their way around this maze of government services. To begin with, they need to determine which service they require, and then they have to look for the organisation or department that provides the service in question and contact it. Because each organisation or department uses its own (isolated) information systems, service consumers are expected to provide the same information over and over again to multiple government organisations.

Layne and Lee (2001) also acknowledge that transaction services are still localised and fragmented. Therefore, more integration of systems and services is needed. First, the vertical integration of systems is expected to happen, as the integration within a functional silo (or stovepipe) is deemed easier than integrating across different functions (Layne & Lee, 2001). This makes sense for situations with strong tiers of government where services in a similar domain can be found at the local, state and federal level (Layne & Lee, 2001).

However, these integration efforts have focused on integrating the parts of service delivering processes vertically (thus, from information system, through back offices, to service delivery channels), thereby creating and reinforcing silos that are differentiated by functionality. As a result, public service delivery – even by one organisation – is fragmented, which leads to a large administrative burden for the service consumer. From a functional perspective, the differentiation in functional silos can be explained, but from a service perspective, the various functions that the departments perform are only part of a broader service delivery process. Therefore, services should be integrated, at least within organisations. This calls for the orchestration of processes, technologies and information (Janssen, Gortmaker, & Wagenaar, 2006). Since many departments have a certain degree of autonomy, this requires an overarching customer strategy and IT architecture. Many organisations are on the path towards new architectures focused on interconnectivity, such as a Service-Oriented Architecture (SOA), which helps organisations to interconnect the previously stove-piped applications.

At many organisations, the online channel was setup to open up information. Later on, also transactional services were made available online. However, in spite of the expectations, the use of other channels, like call centres and front desks, has not decreased. As a result, information and service requests can be made through various service delivery channels. Even if an organisation has digitalised all its information and processes, the contact with clients may still use traditional (non-electronic) channels. Government organisations find themselves in a multichannel situation, despite all the high expectations of electronic service delivery (Pieterson & Ebbers, 2008). The consequences of this have only recently attracted much research attention (Pieterson & Ebbers, 2008; Teerling & Pieterson, 2010). The research indicates that the electronic channel must be seen as one extra channel that has specific characteristics, but does not (yet) replace the other channels that government organisations operate. Therefore, many government organisations find themselves providing most of their services through multiple channels.

Service delivery processes spans multiple silos within an organisation but also spans multiple organisations, both within and outside the public sector. Managing the interdependencies between these different providers of partial services is a task currently often performed by service consumers, resulting in a high administrative burden.

3.1.3.2 From fragmented to cross-organisational integrated services

From a service delivery perspective, the integration of services is often envisaged in web portals. These web portals go beyond individual services of fragmented organisations, and should offer integrated and executable services in a “one stop shop” (West, 2004; Wimmer, 2002b). Once organisations have orchestrated their

internal processes and systems, they can take this next step. As a result of the fragmented nature of government, citizens and businesses have to deal with many organisations. What is essentially a single process from a service consumer's perspective may involve various (government) organisations.

In the Netherlands, integrated service delivery is primarily realised at the organisational level, and is slowly moving towards the national level (Klievink & Janssen, 2009b). Many individual government organisations provide (online) one-stop-shops for their own products and services. Because citizens and businesses still have to manage and orchestrate their interactions with the various government organisations, there is a need for more horizontal and vertical orchestration and integration across organisations. To ensure more integrated government service delivery, governments have to deal with the problem of fragmentation of government within the constitutional, legal and jurisdictional limits (Scholl & Klischewski, 2007).

To join-up these fragments of service delivery, the organisations need to combine their (online) services in a single (web) portal. The common denominator in the portal, from an organisational perspective, is the service consumer (i.e. citizens and businesses) and its situation and data, especially in personalised portals (Andersen & Henriksen, 2006). A personalised portal can facilitate the common case all the organisations involved are working on and the data required at the various organisations. From the service consumer's point of view, this creates a kind of one-stop-shop by providing an overview of all their interactions with the many government organisations.

However, service delivery processes do not stop at organisational boundaries, at least not when seen from the perspective of the service consumer. To focus on what service consumers need rather than what individual organisations have to offer, services should be leading, resulting in inter-organisational integration. This means that the organisations involved in a service-delivery chain need to work together. Therefore, the interdependencies between the parts that make up a service delivery process have to be managed. Many efforts to improve service delivery focus on shifting this task towards the service provider(s) and to thereby diminish the administrative burden for service consumers. Services are integrated or joined-up to increase the efficiency, effectiveness and quality of public service delivery. This increased idea of governments that are providing services is accompanied by a technical development that also represents a shift in thinking and acting from prescribed and controlled functions towards thinking and working in services. The idea is to break functionality down into parts, and the parts can be used to compose functionality (Feenstra, 2011; Fremantle, Weerawarana, & Khalaf, 2002). In such a modular approach, government organisations can open up their functionality, systems and information using – for example – web services (Feenstra, 2011). On the path towards such a modular

approach, government organisations employ architectures that are focused on interconnecting previously stove-piped applications. The modules (e.g. web services) are often used to compose a business process, which can even span organisational boundaries.

Governments want to improve the services they provide to citizens and businesses, displaying a higher level of responsiveness. To cope with the rigidity of traditional bureaucratic structures, they want to move towards an integrated or joined-up government, which refers to the "consistency between the organizational arrangements of programs, policies, or agencies, which may enable them to collaborate" (6, 2004, p. 106). To realise this, the actors involved have to cope with the fragmented structure of the organisations in the public sector, which results in fragmented data, processes and responsibilities. Furthermore, as the initial ICT efforts were performed within a fragmented environment, different functional units within an organisation applied technologies to support their processes independent of each other. This resulted in a landscape of systems and data as fragmented as the organisational structure they reside in. More recent developments in ICT, such as web service technology, have made it easier to cope with these issues, and current and future advances in ICT increasingly enable organisations to deal with the challenges they face. That said, as public service delivery increasingly focuses on inter-organisational processes this introduces an even broader set of interdependencies that needs to be dealt with.

When we look at the literature on how these developments are taking place or expected to take place, many scholars find that the challenges can only be faced when the public sector and the private sector work together – as the boundaries blur – with a focus on cross- or inter-organisational processes and collaboration in a network structure (e.g. Fountain, 2001a, 2001b; Goldsmith & Eggers, 2004; Kamarck, 2007). These new forms of governance for performing public tasks bring even more complex interdependencies at various levels.

3.1.4 Beyond managerialism

The New Public Management movement urged government agencies to use business-like strategies to increase service-levels and to decrease costs. But the NPM notion that the citizen-government relationship should resemble a business-customer relation is contested. It has been criticised for exactly one of its core elements; the private sector approach to public services. Henry Mintzberg, for example, describes the role of businesses in relation to its customers and the difference with how governments should relate to citizens:

"Business is in the business of selling us as much as it possibly can, maintaining an arm's-length relationship controlled by the forces of supply and demand. I have no trouble with

that notion – for cars, washing machines, or toothpaste. But I do for health care. […] I am not a mere customer of my government, thank you. I expect something more than arm's-length trading and something less than the encouragement to consume. […] I am a citizen, with rights that go far beyond those of customers or even clients" (Mintzberg, 1996, p. 77).

In the second edition of their comparative account on *Public Management Reform*, Pollitt and Bouckaert (2004) identify various routes that the countries in their study have taken when it comes to public management reform. They argue that there are some trends to be discerned for different groups of countries. Some – they argue – want to improve the current structures and practices rather than fundamentally restructuring the bureaucracy; a strategy they call "maintaining" (Pollitt & Bouckaert, 2004, p. 97). A second group is called the "modernizers", who do believe in a large role for the state but do acknowledge "the need for fairly fundamental changes in the way the administrative system was organized" (Pollitt & Bouckaert, 2004, p. 97). Third, a group that favours a markets approach and private sector techniques for restructuring the public sector. This group they call the (NPM) "marketizers" (Pollitt & Bouckaert, 2004, p. 97). Finally, at the extreme end, they identify a "minimal state" approach with massive privatisation, which "exists in full blown form only in the tracts of right-wing politicians and theorists" (Pollitt & Bouckaert, 2004, p. 98).

These strategies lead to a pattern with two obvious groupings for the countries they incorporated in their work; a group of NPM marketizers and a group of modernizers. The first group includes the core NPM group – Australia, New Zealand, the United Kingdom, and, "in words if not always in deeds", the United States (Pollitt & Bouckaert, 2004, p. 98). The second group includes continental European countries, including The Netherlands. In the view of Pollitt and Bouckaert, this is a distinctive reform model, which they call the "Neo-Weberian State" (NWS)(Pollitt & Bouckaert, 2004, p. 99). The NWS reaffirms 'Weberian' elements such as (among others) an important role for the state to solve public problems, the role of administrative law and the idea of a unique public service. The 'Neo' elements are (Pollitt & Bouckaert, 2004, pp. 99-100):

- Shift from an internal focus on bureaucratic rules to an external orientation by meeting citizens' needs and wishes, and achieve this by the creation of a professional culture of quality and service;
- Supplementation of the role of representative democracy with more consultation and representation of citizen's views;
- Modernisation of relevant laws for the management of resources within government; and

- A professionalization of the public service, with public servants that are focused on meeting the needs of citizen's instead of on being an expert on a very specific area of law.

Note that this is not the place to embark on the discussion about how NPM and NWS are different, or whether NWS mitigates the hard edges of NPM, nor on the form and size of a disagreement in the discourse on public management reform (see e.g. Dunn & Miller, 2007; Pollitt, Van Thiel, & Homburg, 2007). There are probably as many reforms as there are countries that pursue public sector reform, with an equally high number of different applicable labels. For our purposes, the brief discussion on NWS serves to highlight that also in countries with a (fundamentally) different vision on the role of the state than the one prominent in NPM, the orientation of public service delivery shifts towards an external focus, with a professional public service that is focused meeting citizens needs while keeping the core elements of bureaucracy; a professional bureaucracy, supported by ICT (Zuurmond & Robben, 2009).

The main argument of the critique on NPM is that a business rationale is not fully applicable in the public sector. NPM instruments like a measuring performance were found to also pose risks that have to be dealt with (De Bruijn, 2002). The decline in the 'belief' in NPM has been noticed both in practice (e.g. Ter Bogt, 2002) and in theory (e.g. Dunleavy, et al., 2006). Dunleavy, Margetts, Bastow and Tinkler (2006) argue that the advance of NPM has stalled or has even been reversed in some countries. They also provide in a post-NPM scenario, based on ICTs. Some elements of NPM will be continued, some will be reversed in this new management regime. The need for a different, improved government persists, but the changes in the public sector have moved on from the ideal of enterprising government. In their perspective it moves on to 'digital-era governance' (Dunleavy, et al., 2006). There are many arguments and of perspectives on what comes after NPM. Gerry Stoker (2006), for example, holds that NPM is a reaction to the 'traditional' public administration, and he proposes a new paradigm: 'public value management'. Public value management is in turn a reaction on NPM and both developments (new- and public value management) are in a way a response to the shortcomings of the previous paradigm. NPM is seen as a response to the administrative inefficiencies in 'traditional public administration', whereas public value management is a (partial) response is to the narrow utilitarian character of NPM. Other terms and perspectives include the 'new public service' (Denhardt & Denhardt, 2000), 'new public administration' (Bourgon, 2007), and different variations that focus on the collaborative nature of models that go beyond NPM's managerialism (e.g. Agranoff & McGuire, 2003; Gil-Garcia, Chengalur-Smith, & Duchessi, 2007; O'Leary, et al., 2006).

A key element in these perspectives is that governments should focus on realising value, such as improving service delivery. The public sector is considered to be

something fundamentally different from enterprises. However, instead of a harsh contrast of public versus private, contemporary reform thought stresses that public and private organisations have to collaborate in order to deal with the challenges that governments face today. The shift towards the public sector thus does not go as far as in NPM-type Public-Private Partnerships (PPPs) or outsourcing, but is focused on collaboration with the preservation of public values. In the next section, we therefore further explore the role that public-private collaboration can play in public service delivery.

3.2 Public-private service networks

Developments in the application of ICT in public service delivery are now more or less converging with developments in the views on the role that government should play in an increasingly demanding and information rich society. The general direction of these developments is that we are heading towards a model in which both public and private organisations play a role. In this section we will go into the specifics of public-private collaboration. We will explore public-private collaboration from the background and developments in public administration and – in part – organisation science. Taking these perspectives on public-private collaboration highlights a number of challenges that such collaborations face when employed to provide public services.

3.2.1 The role of private organisations in public service delivery

For the past decades, public administration has seen a variety of terms – the hollow state, third-party government, and the contract state, to name a few – that refer to a similar phenomenon; the development that governments increasingly rely on organisations outside the (central) government itself to perform public tasks (e.g. Bertelli & Smith, 2010; Cordella & Willcocks, 2010; Grimshaw, et al., 2002). This entails devolution of power and a decentralisation of services to lower levels of government and to third parties (Milward & Provan, 2003). This latter group of organisations include non-governmental organisations (NGOs), private organisations and non-profits that are contracted by the government to provide public services or meet policy goals (Bertelli & Smith, 2010). These developments can be labelled a "new governance", even though this has been an established form of governance in some countries for some time (Bertelli & Smith, 2010; Salamon, 2002c). In fact, under the heading of 'the contract state', the idea goes back over forty years (Hood, 1997). For our purposes, we primary focus on the tasks that governments perform directly for the public (e.g. public service delivery) and not on the outsourcing from an internal managerial perspective, such as the outsourcing of IT, even though such outsourcing contracts can also affect public values such as democracy (Cordella & Willcocks, 2010).

When it comes to delegating tasks such as public services to third parties, Milward and Provan (2003) argue that there are two conflicting implicit theories of a hollow state, which is the metaphor they use for the situation in which governments increasingly use parties outside the sphere of government (their focus is on the domain of health and human services):

- The integration of services of organisations involved in those services and thereby creating a "continuum of care". Citizens – including vulnerable groups – can turn from one service they need to another, without problems. This implicit theory of the hollow state – or perhaps strategy is a better label – goes by a variety of names, such as cooperation, partnerships, alliances and service integration. The general idea is that different parties involved in a certain domain of services form a network and the more integrated and coordinated the network is, the more effective its operations will be (Milward & Provan, 2003, pp. 5-6).
- The competing theory for effectiveness in the hollow state is one of competitive contracting. This strategy favours market-type mechanisms. Competitive contracting is therefore a popular strategy for NPM proponents, based on the belief that private organisations are – in competition – better able to provide efficient and customer-friendly services to the public. The idea is that more competition will get the government lower prices for the services they contract out. The coordination of these networks consists of setting-up, monitoring and enforcing contracts among a network of providers (Milward & Provan, 2003, p. 6).

The rationale behind the latter form primarily lies in New Public Management ideas. Our idea of a public-private service network is based on the former (i.e. the continuum of care) as it entails cross-organisational service processes are facilitated. In some cases, the distinction between the two may not always be entirely clear. In this section we will look at ways that governments can collaborate with private organisations, from a perspective of contemporary thought on how the public sector should operate. The perspectives are often rooted in – or contrasted with – the New Public Management reforms. Like Stoker's public value management that we have briefly discussed above, many of the more modern reforms are a response to the harsh elements in NPM reforms by transforming – or at least rebalancing – the main features of NPM (Christensen & Lægreid, 2007), while at the same time striking to overcome the issues with efficiency and effectiveness in government that NPM was a response to in the first place. One of the key elements of contemporary reform ideas is that government organisations have to cross boundaries and focus on collaboration between departments, organisations and even the public and the private sector. These ideas come under different headings, such as New Labour's "joined-up" government in

the U.K., or the concept of "collaborative" public management or -governance that is popular in the United States (Agranoff & McGuire, 2003; Christensen & Lægreid, 2007; Kamarck, 2007). See, for example, the supplement issue of *Public Administration Review* on Collaborative Public Management (introduction: O'Leary, et al., 2006) or the special issue on A State of Agents in the *Journal of Public Administration Research and Theory* (introduction: Heinrich, et al., 2010), two major public administration journals.

There is a substantial body of scholarly work on the role that organisations outside the government play in the domain of government. In a wide variety of ways, collaboration with (and – in NPM-based streams – outsourcing to) private parties and other levels of government is seen as a way for (central) governments to improve service delivery and/or its efficiency (e.g. Bertelli & Smith, 2010; Fountain, 2001a; Heinrich, et al., 2010; Kamarck, 2007; Kettl, 2006; McGuire, 2006; Milward & Provan, 2000; Provan, et al., 2004; Salamon, 2002a; Selsky & Parker, 2005). The term 'private' will be used in this work to distinguish between the public sector and organisations outside that sector, even though it is sometimes difficult to demarcate between the sectors since some boundaries may not always be clear. Selsky and Parker (2005) identify four "arenas" of what they call cross sector partnerships to address social issues (CSSPs): business-nonprofit, business-government, government-nonprofit and trisector (Selsky & Parker, 2005, p. 851). Furthermore, § 3.1 illustrates that also organisations within the public sector have to collaborate to realise integrated service delivery (i.e. government-to-government, or G2G). As not every organisation outside the government is relevant to our work, we will need to narrow the definition somewhat more. As the focus is on the delivery of public services, we limit it to that. Public-private is – in this work – the collaboration and/or agreements between governmental and private organisations (including both commercial and non-profit), aimed to provide services that are (at least partially) publicly funded (Milward & Provan, 2003; Pongsiri, 2003). We will look at these two components in turn, starting with lessons from partnerships between public and private organisations, followed by a discussion on service delivery by such collaborations.

3.2.1.1 Private partners

The JPART special issue "A State of Agents" (introduction by Heinrich, et al., 2010) is on the increasing role that 'third parties' play in the domain of government (perhaps a conceptual successor of the hollow state metaphor, see Milward, et al., 2010). Cooperation between public and private organisations has a long history. Already back in the 1970's, and again in the 1990's, public-private partnerships (PPPs) were established to strike a balance between the entrepreneurial spirit and public interest considerations (Linder, 1999). Research on public-private partnerships identifies both strengths and weaknesses in the practice of having private parties execute

projects for the public interest. Strengths include possible financial gains, while weaknesses include possible conflicts of interests and concerns on privacy.

There is an implicit assumption that private organisations do certain things best while public organisations are better at other things. Cooperation between these sectors should ideally bring the best of both worlds (Pongsiri, 2003; Rosenau, 1999). However, cooperation with other organisations introduces new sets of stakeholders, with potentially different interests, goals, procedures, and relations. Public values like the uniformity of the channels used, the equality of rights and access for all citizens, and warranting the privacy of citizens may depend on the quality of a private organisation. Focus on profits may lead private organisations to address only those clients that are profitable, since "business is in the business of selling us as much as it possibly can" (Mintzberg, 1996, p. 77). Their objective is to make a profit, whereas governments have other goals, such as creating public value (Kelly, Mulgan, & Muers, 2002). Other potential issues specific to public-private cooperation include accountability, transparency and privacy. These types of potential conflicts of interests cannot always be avoided; they have to be dealt with (Flinders, 2005; Rosenau, 1999).

Research in the United States and the United Kingdom show that the performances of these partnerships are mixed, as they often result in short-term financial gains at the expense of long-term public costs on accountability, transparency and equal access to services (e.g. Flinders, 2005; Rosenau, 1999). In the Netherlands, PPPs are on the political agenda for e.g. transport infrastructure projects (e.g. Koppenjan, 2005). Advances in ICT may provide new incentives to come to successful public-private cooperation by shaping collaborations with private partners for public services, as this may be necessary to achieve improvements in service delivery to enable integrated, demand-driven and citizen oriented e-government. Managing these public-private collaborations is necessary to come to successful cooperation.

As the results of PPPs are mixed (for examples from the U.S. see e.g.: Rosenau, 1999), some scholars have investigated the experiences in PPPs in order to identify lessons that can be learned from PPP projects. Such lessons can also be valuable for collaborating organisations in the public and private sector that our work is focusing on. Various disciplines (including behavioural, political and public policy sciences) provide points of concern when it comes to the collaboration between public and private organisations (note that these are not all on public-private partnerships for the provision of services, but also for other government activities, such as policy partnerships and infrastructure development). Issues that are relevant to our topic include (cf. Flinders, 2005; Mintzberg, 1996; Pongsiri, 2002, 2003; Rosenau, 1999):

- Difference in the goals and interests of the private sector (e.g. profit, secrecy) and the public sector (e.g. social goals, transparent). Conflicts of interests cannot always be avoided and thus have to be dealt with;
- Equity considerations; from an economic perspective, (commercial) private partners may be better off when they provide services to that part of the population that is either likely to costs as little as possible or that is able to pay the price. Vulnerable populations may not be able to play the role of a critical consumer;
- Accountability; even if private partners are responsible for a failure, governments cannot allow public services to fail as they are held accountable to the general public;
- Cooperation may lead to complex structures and more rules and regulations.

The key component of these points of concern is that the advantages of collaboration (such as efficiency gains and a sharing of risk) come with considerations on e.g. equity, democracy and politics (Flinders, 2005; Rosenau, 1999). The starting point for public-private cooperation should be a (potential) improvement of services, and not a form of public sector reform, some scholars conclude (Linder, 1999; Pongsiri, 2003).

3.2.1.2 Public-private collaboration for service delivery

In § 3.1.4, we found in literature on public administration and public management reform that governments are or should be moving towards a model in which organisations outside government play an increasingly important role. The literature provides numerous examples of public-private collaboration in policy making processes, in health care, in welfare and social security, utility and infrastructures (e.g. Koppenjan, 2005; Milward & Provan, 2003; Pongsiri, 2003; Rom, 1999; Rosenau, 1999). The question now is why governments are seeking collaboration with private organisations to fulfil public tasks such as public services. We provide a number of potential motivational forces, and do not claim to be exhaustive in these, before describing what public-private collaboration can do for service delivery.

- Although often a response to the narrow utilitarian character of NPM, contemporary models of public management maintain that collaboration with (though not outsourcing to) the private sector is important to realise public values and goals, such as service delivery (e.g. Denhardt & Denhardt, 2000; Fountain, 2001a; Kamarck, 2007; Salamon, 2002c; Stoker, 2006);
- Service integration (and the necessary collaboration between organisations) has become easier or technically feasible. According to Perri 6 (2004), in The Netherlands there has been long term attention for the organisational level and horizontal links between organisations, and not so much on the political level. Electronic service delivery and other digitisation processes are an

important component for service integration or joining-up (cf. Dunleavy, et al., 2006; Klievink & Janssen, 2009b);
- Dependence on resources or competencies of other organisations (cf. Selsky & Parker, 2005);
- Private organisations can add value to services, for example as an intermediary party that offers facilitating services to both public and private services and thereby removing the necessity that the service consumer visits the other service providers to acquire their individual services (e.g. Giaglis, Klein, & O'Keefe, 2002; Janssen & Sol, 2000; Klievink & Janssen, 2008b; Sarkar, Butler, & Steinfield, 1995);
- The Electronic Markets Hypothesis – suggested by Malone et al. (1987), argues that, by reducing the costs of coordination, ICT will support an overall shift towards a proportionally increased use of markets over hierarchies to coordinate economic activity. Given the critique on NPM, this shift will not be to a full market, but to a form in between, such as networks.

The post-NPM era focuses more on strategies of partnering – in which the public and the private sector partner with each other to address social issues – over a strategy a strategy of substitution – in which the private sector takes over the roles that are traditionally attributed to the public sector (logic of substitution and partnership derived from Selsky & Parker, 2005). Either way, the traditional boundaries between sectors are blurring, which has implications for the provisioning of public services.

Cross-organisational service delivery is among the "wicked" issues that governments face today, which requires organisations to contribute their part in addressing these issues collaboratively (Lowndes & Skelcher, 1998). Integration or joining-up of service delivery requires organisations to cooperate across organisational borders as information and systems are dispersed. The dependencies between organisations realising integrated service delivery resemble a network structure, in which a multitude of interdependent actors exist (e.g. De Bruijn & Ten Heuvelhof, 2000). Realising cross-organisational service delivery therefore presents a major challenge for governments. It requires that organisations adapt their business processes to the service delivery chain or network, but often the organisational goals of the (autonomous) parties are not in line with the goals of the chain as a whole. However, the performance of the chain depends on the individual organisations as their performance impacts quality and lead-time of services. The division of the business process into tasks distributed over many organisations, thus, creates a need for the coordination of these tasks and the information exchanged between the organisations involved. The dependencies in cross-organisational service delivery go far beyond the governance and managerial approaches that public administration and work on public-private partnerships usually offer for coping with these dependencies.

Integrated service delivery has dependencies that stretch from the front office channels that citizens and business contact, to the back offices of organisations that perform the tasks and processes required to provide an answer or result to the service consumer. The information and systems are often fragmented and organisations are often also dependent on other organisations, for example to execute certain processes or to provide information that is needed by a certain department or service channel. The dependencies therefore resemble a network structure, which implies a multitude of interdependent departments and organisations (De Bruijn & Ten Heuvelhof, 2000; Powell, 1990). Networks are characterized by variety and interdependence of actors. This situation is often incompatible with the hierarchical structures that government organisations are organised in. This also impacts the strategies that organisations can employ to improve service delivery. Still, to address the issues that governments face today, governments increasingly find themselves governing by network (Goldsmith & Eggers, 2004). Goldsmith and Eggers (2004) contrast governing by network with the traditional hierarchical structure of government. Not everything can be done by governments; that costs too much and increases the administrative burden. But not all can be done by the private sector either, as the market does not steer towards the collective good and may lose key public values such as equality, democracy and transparency out of sight.

3.2.2 Governing (by) networks

Government is not one singular organisation, but consists of many organisations, on different levels, with different sizes, different tasks and different degrees of interdependency and collaboration with other government organisations (Van Dijk, 1997). To meet contemporary challenges that governments face, including improving its operations, the hierarchical approach has to be substituted with governing by networks of both public and private organisations (Goldsmith & Eggers, 2004) (Salamon, 2002b). As Powell (1990) argues, the normative basis for networks is in complementary strengths. Collaborative, inter-organisational networks have become a common way to deliver public services (e.g. Provan & Milward, 2001). As services are a joint production of multiple actors in a network, service delivery by governments is now a task of arranging and managing networks instead of managing a bureaucracy (Milward & Provan, 2003).

3.2.2.1 Networks

The use of the 'network' concept to describe the organisational setting in which governments perform activities – including public service delivery – is commonplace now (e.g. Provan & Milward, 2001). Networks are often considered as a basic form of organising, along with hierarchies and markets (e.g. G. F. Thompson, 2003). In some literature, approaches and mechanisms attributed to networks (e.g. importance of

trust and mutuality) are found under the name of inter-organisational relationships. For example, for this kind of relationships Dekker (2004) identifies governance mechanisms such as informal control (e.g. trust), as opposed to governing (isolated) transactions – i.e. in markets.

The concept of networks is still subject of debate. Implicit in the public sector reform literature that stresses the importance of collaboration and networks is the idea of networks as a form of organising. However, in their review of literature on networks in organisational research, Borgatti and Foster (2003) also look at concepts such as embeddedness and social capital. Furthermore, they illustrate the complexity of the concept by describing the discussion on whether a network is an intermediate form between markets and hierarchies or a new and unique organisational form. Powell (1990), for example, stresses the unique characteristics of networks.

According to Raab and Kenis (2009) networks are "consciously created groups of three or more autonomous but interdependent organizations that strive to achieve a common goal and jointly produce an output". In this definition, organisations are interdependent only for achieving the joint objective. This seems to be the case in public-private service networks, as the purpose of the network is to benefit from the advantages that the public and private partners bring when partnering, while at the same time both types of organisations have their own specific activities. If the network would not exist, this would surely harm the common objective, but not necessarily the individual organisations behind that objective. However, De Bruijn and Ten Heuvelhof (2007) argue that due to the dependencies on other actors, governments cannot govern hierarchically by controlling other organisations. In most cases (organisations in) governments find themselves in a network with other government agencies, other layers of government (e.g. the European Union), businesses, non-profit organisations, etc. (De Bruijn & Ten Heuvelhof, 2007). In order to realise anything in such complex multi-actor situations, governments have to acknowledge these networks and collaborate with others. If governments fail to do this, the complex set of interdependencies can turn into a spider's web that makes progress (e.g. implementing new policies) slow or very difficult to achieve (De Bruijn & Ten Heuvelhof, 2007). In the public sector, networks present an alternative to (bureaucratic) policy and decision-making processes and service delivery (e.g. Kamarck, 2007; Kenis & Provan, 2009; Klijn, Steijn, & Edelenbos, 2010), of which we focus on service delivery networks.

The definition of Raab and Kenis focuses on goal oriented networks, whereas networks can also emerge from the dyadic interactions between actors (Raab & Kenis, 2009). However, in other work the rise of networks is often seen as a result of other developments, due to which (public) organisations find themselves being part of a network (De Bruijn & Ten Heuvelhof, 2007; Fountain, 2001a; Goldsmith & Eggers,

2004). De Bruijn and Ten Heuvelhof identify four general developments that have contributed to our thinking 'in' networks: professionalization of the working force, globalisation, blurring boundaries between the public and the private sector, and the impact of ICT (De Bruijn & Ten Heuvelhof, 2007). As the first development indicates, networks forms of organising can also apply to the internal structure of an organisation: organisations as networks (Contractor, Wasserman, & Faust, 2006). Such network organisations have a large number of interdependencies and relationships among and between professionals and managers. So, organisations can both consist of networks of professionals and departments, and be a part of a network of organisations (Contractor, et al., 2006; De Bruijn & Ten Heuvelhof, 2007). The focus on networks as a tool of government is often on organisational networks marked by interdependencies between government agencies and third-party actors (Salamon, 2002a). But given the autonomy of many departments and other actors within government organisations, a boundary between intra-organisational and inter-organisational networks cannot be drawn sharply. Networks are thus a way of seeing the organisation of the host of actors that play a role in the act of governing, including autonomous units within an organisation. This revisits the earlier definition of networks being consciously created. The concept of networks is also a view and a way of analysing the structure within and between organisations, even in society in general (Castells, 2010; Van Dijk, 2006). Increased interdependence requires organisations to become a network player in order achieve common goals.

Networks are often discussed on a scale with hierarchies and markets at the ends, which are considered the traditional core archetypical forms of organising or coordination (Powell, 1990; G. F. Thompson, 2003). Networks differ from markets in that the actors in the network pursue "repeated, enduring exchange relations with one another" (Podolny & Page, 1998, p. 59), instead of relationships that are formed only for specific transactions (e.g. transfer of goods and resources (Podolny & Page, 1998)).

3.2.2.2 Governing networks

Networks are often considered to be a form of governance somewhere in between markets and hierarchies. Networks do not displace hierarchies and markets, but complement and support them, argues Thompson (2003). An important distinction can be made between intra-organisational and inter-organisational governance. Thompson (2003) describes the structure of the public sector (comprising multiple public organisations) as being governed by hierarchy, whereas such inter-organisational structures in the private sector employ market mechanisms. However, when looking at the intra organisational coordination, both public and private sector organisations are often still organised in a hierarchical fashion, with employer-employee relationships, routines, and managerial supervision, traits that mark

hierarchy (Powell, 1990). Bureaucracy is the main form of hierarchy in public organisations and management is that in the private sector. Rainey and Bozeman, in their assessment of two decades of research on comparing public and private organisations, found that although the perceived level of red tape is higher in government organisations, the actual degree of formalisation does not differ much between public and private organisations (Rainey & Bozeman, 2000). Only when it comes to the formalisation of personnel and purchasing processes, more authority within the organisation and from external authorities was found in the public sector(Rainey & Bozeman, 2000).

As services are a joint production of multiple actors in a network, the task of service delivery by governments is one of arranging and managing networks rather than hierarchical organisational structures (Milward & Provan, 2003). Milward and Provan (2003, p. 15) argue that network management has three main components:

- Creating incentives for cooperation;
- Designing efficient relational contracts, and;
- Institutional structures with clear principal-agent relationships.

Furthermore, they found that it is crucial that a network needs stability to maintain its ability to provide joint services (Milward & Provan, 2003). Stability, in their work, has primarily to do with the environment of the network. There are also other exogenous factors that impact the functioning of a network, such as whether its inception was voluntary or mandatory (Kenis & Provan, 2009).

Robert Agranoff found that, despite the collaborative nature, networks are not without conflicts and power issues (Agranoff, 2006). However, as the interactions between the actors that are part of a network are often many and complex, exerting power may come at greater costs than in one-time interactions (cf. Axelrod, 1984). Therefore, actors build long-term relationships based on trust (Madhok, 1995), which reduces the perceived probability of loss (Nooteboom, Berger, & Noorderhaven, 1997). Furthermore, it is necessary to specify the various roles in the network, and setup agreements between those roles. Agreements can take a variety of forms, such as contracts, procedures or documents that describe the collaboration between the parties involved. Such agreements often contain documentation, financing, taxations, technical details and loads of detailed arrangements, which make agreements very complex, especially when public and private partners collaborate (Grimsey & Lewis, 2002). Governance mechanisms in public-private networks thus includes trust, relationships and contracts to settle the role of each of the partners in a network (e.g. Milward & Provan, 2003; Powell, 1990). In relationship to the third component; principal-agent relationships refer to the situation in which one actor – the principal – delegates work to another actor – the agent, which performs that work and the relationship is primarily governed by contract (Eisenhardt, 1989).

3.2.3 A definition of public-private service networks

Now that we have discussed public service delivery, the relationships between public and private organisations and the concept of networks, we can provide a definition of public-private service networks:

> A public-private service network is a collaborative group of at least three autonomous organisational units from both the public and the private sector (both commercial and non-profit), which aims to facilitate or provide activities that follow from the obligations or entitlements that individual citizens or businesses have towards government.

3.2.4 Challenges in coordinating public-private service networks

Based on the literature on public service delivery by networks comprising public and private organisations, there are a number of elements in public-private service networks that result in interdependencies, and thus contribute to the coordination challenge.

3.2.4.1 Goals, interests and values: public sector vs. private sector

Networks can be typified as having multiple stakeholders. These stakeholders each have their own goals and interests. The organisations in a network can have multiple stakeholders, sometimes with competing views. Furthermore, as the situation and structure of the various organisations differs, any arrangement in the network has to deal with these differences. When it comes to public-private networks, the difference between the goals, interests and values makes it potentially conflicting. The literature shows that when public and private organisations collaborate, there are concerns on public values such as equity and accountability.

3.2.4.2 Actors positions: authoritative approach vs. autonomy of actors

In networks of organisations, many actors are to a greater or lesser extent autonomous. Public authorities cannot rely on formal top-down mechanisms to control private partners in the network. However, also beyond the public-private distinction there are quite a number of public organisations and departments within those organisations that operate (semi-)independent of other actors within the same organisation or within the public sector.

The relatively autonomous positions of organisations and departments may impact the number and complexity of interdependencies. The goals, values and interests of the (autonomous) departments and organisations may differ from the goals and interests of others, and from that of the network as a whole. Still, the performance of the network as a whole relies on the performance of the individual contributors. Therefore, cross-department, cross-organisational and cross-sector collaboration is necessary, albeit difficult.

3.2.4.3 Collaboration within organisations & between organisations

The organisational component impacts the improvement of the functions of government, such as service delivery. Public organisations are often setup to perform certain functions, usually by executing laws. The result is that many government agencies consist of numerous departments that are divided based on the different functions they perform. Such functionally separated departments often have their own information systems and form siloes within an organisation. The focus on vertical integration has shifted to horizontal integration within an organisation. Service delivery is currently primarily realised at the level of single organisations and is slowly moving towards the inter-organisational level, stage models show. This introduces a new set of challenges as the improvement of service delivery is no longer on the integration within organisations, but also between organisations and sectors.

In this chapter, we have discussed the reform movements that are a response the alleged inefficiencies and ineffectiveness of (bureaucratic) government. Reform movements for example proposed that the problems of government can only be resolved by adopting private sector approaches in the public sector. More recently, there is a focus on collaboration among public agencies and between public and private organisations; public and private, instead of public versus private. The idea is that collaboration between organisations within the public sector should be strengthened to overcome the fragmentation and thereby to provide integrated or joined-up services to service consumers. Furthermore, the collaboration with the private sector should be strengthened, as many service processes – at least form the service consumers' point of view – cross the boundaries between the public and private sector.

In cross-organisational service delivery processes in public-private networks, interdependencies are found both within the individual actors or organisations and between them. Different organisations have different ways of handling them. The fragmentation and departmentalisation of public organisations leads to considerable dependencies within public organisations, with different departments or functional silos having different sets of clients, ways of working, technological infrastructure, etc. Integrating service delivery within the organisation poses a challenge for coordinating these elements within the organisation. These developments make organisations manage the dependencies among their internal departments, processes, data and systems. As a result, there are mechanisms for coordinating intra-organisational interdependency – often by integration. When taking a network view on service delivery, the interdependencies that are relevant to the organisations are accompanied by interdependencies seen from the perspective of integrated service delivery.

3.2.4.4 Types of relationships and forms of collaboration

The relationship between public and private partners can vary. Private organisations can – for example – bid in a system of competitive contracting for performing tasks for government, but they can also function as a partner of government agencies in an attempt to create a continuum of care to accommodate the cross-organisation character of service consumers' processes. The relationship with private organisations affects the role that government organisations have in public-private collaboration, ranging from principal-agent to peer-based relationships.

3.2.4.5 Various forms of organising, various environments

With public-private networks, governments find themselves performing their tasks in networks, which entails that organisations with different structures and modes of governance – hierarchy in the public sector and market-like mechanisms in the private sector – have to collaborate in a network structure. The inter-organisational governance of public organisations is adapted to function in hierarchies, whereas the inter-organisational governance of many private organisations is focused on functioning in market-oriented systems. Furthermore, the internal structure of an organisation may be a network as well and therefore, the boundaries between intra-organisational and inter-organisational networks cannot be drawn sharply. Cooperation in networks thus leads to complex structures and challenges, which may involve other types of governance mechanisms for which governments have not yet developed instruments even though they increasingly rely on parties outside the government.

3.3 Coordination

In the previous sections, advances in public service delivery have been described by pointing out the changing role that private organisations can play as a partner of the public sector when it comes to service delivery. In such collaborations, there are many – and complex – interdependencies between the actors involved. In such a situation, coordination is required in order to realise "concerted action" (J. D. Thompson, 1967, p. 55). In the public sector, inter-organisational dependencies are coordinated by bureaucracy, whereas the inter-organisational dependencies in the private sector are often coordinated by market-type mechanisms, such as price and competition. In a network of public and private organisations, both sectors are involved and have to collaborate to achieve collective results.

Hierarchies, markets and networks can be considered not only concrete forms of organisation, but also as distinct forms of socio-economic coordination and governance (Podolny & Page, 1998; G. F. Thompson, 2003). In that distinction, hierarchy coordinates by administrative means such as rules and bureaucracy and thus forming a "structured mechanism of control, designed to run large and complex

organizations" (G. F. Thompson, 2003, p. 23). This form can coordinate both the intra-organisational and the inter-organisational level. Markets – on the other hand – achieve a coordinated outcome without active design, but spontaneously through a market system (G. F. Thompson, 2003). Finally, networks are somewhere in between, not coordinated solely by price mechanisms nor solely by consciously designed administrative structures. They rely more on "informal practices of coordination", such as common interests, personal contact, loyalty, and trust (Adler, 2001; G. F. Thompson, 2003, p. 30). The distinction between these three core forms of coordination and governance is important for the rest of the section. Still, from these generic forms of coordination, we cannot yet tell how concerted action in networks can be achieved. We thus need to clearly establish what coordination is – in this section from a theoretical perspective – and what it means for public-private service networks. There are various views on coordination.

Perri 6 (2004) sees coordination primarily as a solution for fragmentation, which is a key issue in public service delivery. His view on coordination is that of the development of ideas on working together, and "joint information systems, dialogue between agencies, processes of planning, and making decisions" (6, 2004, p. 106). The actual implementation of the products of coordination is referred to as *integration*, for example in the form of setting up common organisational structures and merged practices (6, 2004). Next to the coordination of policy and programmes, 6 identifies two levels of coordination and integration that are related to service delivery: that of the service providing organisations and that of the individual services to the client (see table 3 in 6, 2004). 6 describes coordination as a category of relationships, in which coordination refers to somewhat loose mechanisms such as temporarily planning or working together and exchanging information (6, 2004). When it comes to the actual collaboration on core objectives of one of the actors involved, 6 categorises this under the label of integration. This is a valuable distinction for 6s purpose (focused on a single tier of government), but for our purposes, the actual implementation of coordinating in a multi-organisational setting does go far beyond joint planning. However, the actual integration of activities, systems, and so on, may not be feasible in public-private service networks due to the autonomy of the actors involved.

When it comes to work on coordination, Thomas W. Malone and Kevin Crowston are among the most influential scholars that have tried to define coordination. Their definitions of coordination range from simple – "the act of working together" (Malone & Crowston, 1991, p. 3) – to more elaborate: "the additional information processing performed when multiple, connected actors pursue goals that a single actor pursuing the same goals would not perform" (Malone, 1988, p. 5). The latter definition would imply that coordination is something that does not occur when only one actor is involved, a position Malone and Crowston no longer hold (Malone & Crowston, 1990).

In the often used definition from their hand, the focus is no longer on actors, but on activities: "coordination is managing dependencies between activities" (Malone & Crowston, 1994, p. 90). This simple definition is based on the idea that without interdependence, there is nothing to coordinate, a view consistent with Thompson's (1967) observation that a situation of interdependence calls for coordination in order to achieve concerted action.

The simple definition of coordination is intuitively appealing, as it makes clear that in a situation that requires coordination, there are multiple activities that are interdependent. This is the case in the public-private service networks we study in this research. Still, this perspective on coordination is not yet sufficiently specific. We could see public-private service networks as systems of elements that are interdependent, for which we need to demarcate the elements that are part of the system. Therefore, we use the somewhat more specific definition from Thompson (2003) who – by coordination – means that "the elements in the system are somehow brought into an alignment, considered and made to act together" (G. F. Thompson, 2003, p. 37). This definition applies to Thompson's original distinction between hierarchies, markets and networks as three coordinating devices. In his perspective, these three have a different role than governance mechanisms, by which he means the regulation of the elements of the system (G. F. Thompson, 2003). Governments need their partners in service delivery to (be able to) play their part (Kettl, 2002). As this may involve dependencies at the regulatory level as well, in this stage we do not want to limit ourselves by excluding regulation and governance from the concept of coordination. Still, the definition of coordination needs elaboration on what are considered the elements in the system that are interdependent, and thus require coordination. The precise elements in a specific public-private service network may vary, and are therefore specific for the cases we look at in the empirical phase of this research. However, from what we have discussed until now, we can identify three main interdependent elements: 1) organisations, as they have to collaborate, 2) service delivery processes, as they have to be integrated or joined-up, and 3) information technologies, as they have to transcend individual siloes. In this section, we look at coordination theory and the concepts of dependency and coordination that it provides.

3.3.1 Types of interdependence

A precise definition of interdependence is hard to provide, as it has both a strong intuitive meaning and it has generated disagreement among scholars (Rockart & Short, 1989). Broadly speaking, interdependence is the opposite of independence. More specifically, interdependence is the extent to which the tasks in a network require the elements (e.g. departments, people, and systems) to work with one another (adapted from: Cheng, 1983).

Malone et al. (1999, p. 429) suggest three basic *types* of dependencies (which they in turn attribute to Zlotkin):

- *Flow* dependencies arise when "one activity produces a resource that is used by another activity", which applies to almost every step in every process;
- *Sharing* dependencies "occur whenever multiple activities all use the same resource";
- *Fit* dependencies arise when "multiple activities collectively produce a single resource".

These types of dependencies are visualised in **Figure 3** and are related to the five types of dependencies that Malone and Crowston identified earlier (1994): shared resources, producer/consumer relationships, simultaneity constraints, task/subtask dependencies and 'other' dependencies (such as a shared reputation).

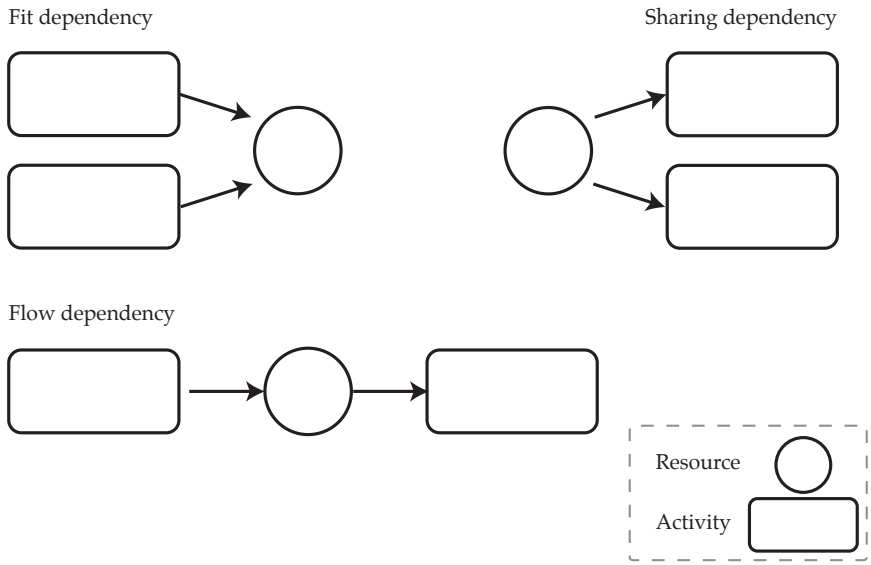

Figure 3: **types of interdependence (adapted from: Malone, et al., 1999)**

When matched with the three abovementioned general types of dependencies, shared resources was generalized to sharing and producer/consumer relationships are part of the flow type of dependencies. The other two types (leaving out the miscellaneous category) are not that directly mapped to the three general types. Simultaneity constraints occur when activities need to – or cannot – occur at the same time (Malone & Crowston, 1994). As this type of dependency has to do with the ordering of activities, it is most related to the flow dependency type. Task/subtask dependencies relates to the decomposition of a goal into activities that achieve sub goals, which together will achieve the overall goal (Malone & Crowston, 1994). Since the outcomes of the various activities have to contribute to achieving the overall goal, this

dependency type is primarily a form of a *fit* dependency. However, the various activities aim to achieve sub goals that are likely to be part of a flow (either sequential or parallel), in service integration we expect the *flow* type of dependencies to often co-occur with *fit* dependencies.

When applying the distinction between types of dependencies to service delivery processes, flow dependencies entail that an actor (e.g. department or organisation) needs the service components preceding its own activities to be completed before it can perform the next step, which, in turn, could be the input required for still another actor in the service delivery chain. The sharing dependency refers to the situation in which multiple actors in a service delivery process require the same resource such as a piece of data. Finally, fit dependencies are at play when multiple actors jointly provide a service, in which a fit is required between the component of each individual actor and the overall service for which each component needs to be useable.

In addition to these types of dependencies, we draw on Thompson (1967) to also distinguish between three *forms* that interdependence can take:

- Pooled interdependence; each part renders a discrete contribution to the whole and each is supported by the whole (so there is no direct dependence on or support for other parts);
- Sequential interdependence; in addition to possible pooled aspects of interdependence between parts, there is also a direct interdependence between them, with a certain order of interdependency. This is somewhat related to the *flow* dependency type mentioned earlier, but more specific (which is also a result from Thompson's focus on organisational action) and has a serial form;
- Reciprocal interdependence describes the situation in which the outputs of each become inputs for the others. This interdependence also has pooled and serial aspects to it, but the "distinguishing aspect is the reciprocity of the interdependence, with each unit posing contingency for the other" (J. D. Thompson, 1967, p. 55).

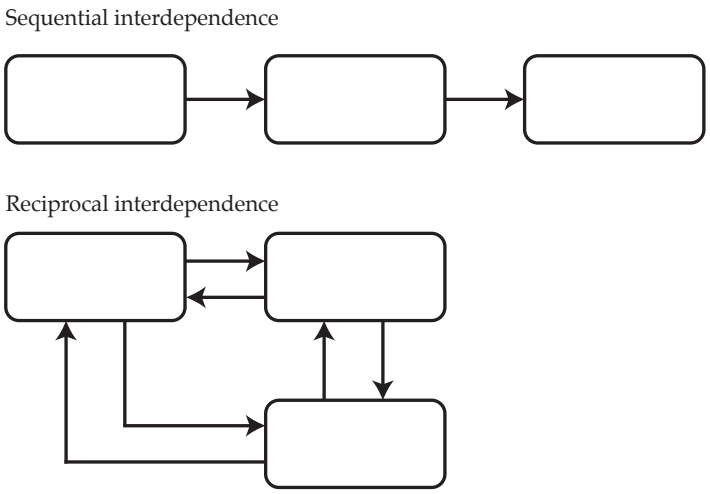

Figure 4: **forms of interdependence**

To illustrate the difference, the sequential and reciprocal forms of interdependence are visualised in **Figure 4**. Thompson argues that the forms of interdependence form a (Guttman-type) scale as "all organizations have pooled interdependence; more complicated organizations have sequential as well as pooled; and the most complex have reciprocal, sequential, and pooled" (p55). In this order, the dependencies are more difficult – and thus more costly – to coordinate. As Powell notes, networks are typified by reciprocal patterns (Powell, 1990).

3.3.2 Coordination mechanisms

Next, we need to know how these various types of dependencies can be dealt with by means of coordination mechanisms. A coordination mechanism is a set of methods to provide tools for managing interdependence (e.g. Xu & Beamon, 2006). For Malone et al. (1999), the different kinds of dependencies (discussed above) can be associated with coordination mechanisms to manage them.

The basic modes of coordination are hierarchies and markets. Networks are in a way in between of these two, but are also on a somewhat different level if we regard networks as a conceptual frame in which both hierarchical and market modes of coordination come together. The public sector consists of organisations that are coordinated hierarchically. The inter-organisational level is also coordinated by hierarchy. Many private firms are also organised hierarchically (i.e. by management), but their external environment is governed – or coordinated – by the market system. Thus, the intra-organisational coordination of both public and private organisations is based on hierarchy, making the coordination vertical. The coordination mechanisms that public organisations employ to manage their interdependencies with other

organisations thus differ from the mechanisms that private organisations employ for cross-organisational interdependencies (cf. G. F. Thompson, 2003). In a public-private network, both modes of inter-organisational coordination come together, thus both types of organisations may not be properly equipped to manage their dependencies in the network they find themselves in.

Coordination mechanisms are means to cope with coordination costs. Coordination costs are a type of transaction costs focused on the costs of the information processing that is required to manage the dependencies between the activities (of organisations, workers, machines, etc.) that jointly perform a process (Malone, et al., 1987; Williamson, 1975). Malone, Yates and Benjamin provide a set of examples in terms of hierarchies and markets: "coordination costs include determining the design, price, quantity, delivery schedule, and other similar factors for products transferred between adjacent steps on a value-added chain. In markets, this involves selecting suppliers, negotiating contracts, paying bills, and so forth. In hierarchies, this involves managerial decision making, accounting, planning, and control processes. The classification of a specific task as a production or a coordination task can depend on the level and purpose of analysis, but at an intuitive level, the distinction is clear" (Malone, et al., 1987, p. 485).

Because there are different forms of interdependencies, different "devices for achieving coordination" can be identified (J. D. Thompson, 1967, p. 56). Based on the work of March and Simon (1958), Thompson identifies three main ways to achieve coordination:

- *Standardisation*; a consistent set of routines and rules constrain the freedom of actors to the space consistent with the room that other actors have in the interdependent situation;
- *Coordination by plan*; establish schedules that govern the actions of interdependent actors; and
- *Coordination by mutual adjustment*; involves new information during the process (J. D. Thompson, 1967, p. 56).

The latter form is labelled *coordination by feedback* in March and Simon's work. They argue that the coordination device that is used depends on the predictability of the situation: "[t]he more stable and predictable the situation, the greater the reliance on coordination by plan; the more variable and unpredictable the situation, the greater the reliance on coordination by feedback" (March & Simon, 1958, p. 160).

This 'classical' work on coordination primarily focuses on single (but complex) organisations that are composed of interdependent parts, not unlike the structure of fragmented and departmentalised government. Especially the form of coordination by mutual adjustment may be applicable to the reciprocity that typifies networks. The first two are more related to coordination by hierarchy, if they can even be considered

to be on the same page as the distinction between hierarchies and markets, as highly routine and stable markets (such as the energy market) also coordinate their infrastructural and technical dependencies by standardisation.

We move beyond the single organisation by drawing on literature on dependencies in supply chains, we can identify four attributes of coordination mechanisms (based on Xu & Beamon, 2006):

- Resource sharing structure, including – but not limited to – the information structure (Malone, 1987; Xu & Beamon, 2006);
- Decision localisation; centralised (one organisation is in control) or decentralised (each organisation is autonomous), with the important note that the selection of a coordination mechanism is also a decision (Xu & Beamon, 2006);
- Level of monitoring and control, ranging from high to low; and
- Risk/reward sharing; ranging from fair (higher risk is related to higher benefits) to unfair (less risk, greater benefits, or vice versa).

Furthermore, Xu and Beamon also mention the dimension of formality, ranging from informal personal meetings to more formal arrangements (Xu & Beamon, 2006). The importance of the informal aspect is well described by Chisholm (1989), who emphasises that "[a]lthough the contention that higher levels of interdependence in a system demand more coordination is empirically strong, the argument that only formal schemes of a centralized character can provide that coordination remains weak"(Chisholm, 1989, p. 11).

Within organisations, the process flow and the interactions between actors accommodating it are often structured and thus relatively predictable. The process flow of services is managed throughout the departments within an organisation. The interdependencies between steps in the process are often sequential and match the dependency types and coordination mechanisms well described in coordination theory (e.g. Malone, et al., 1999). Such coordination mechanisms are required and fitted to deal with fragmented (and legacy or monolithic) systems, fragmented data, functional silos and other components of the organisation that pose an interdependency challenge.

For cross-organisational service processes, the focus on the interdependencies between process steps is called business process coordination or orchestration. Process orchestration is the goal-oriented coordination by a single responsible entity in a cross-organisational process flow (e.g. Gortmaker & Janssen, 2007; Janssen, et al., 2006). Both conceptually and technically, the overall business process can be broken down in components. As many processes are automated, the dependencies between process steps entail dependencies between information systems and technology as well. To deal with this interdependence, organisations open up their information

systems through modularised pieces of functionality. This is similar to the concept of loosely coupled structures that is dominant in the Service Oriented Architecture (SOA) paradigm (McGovern, Sims, Jain, & Little, 2006; Parnas, 1972). In this paradigm, functionality, applications and systems of various departments and organisations are made accessible through Web services, which are components that can be invoked by applications or other services (van der Aalst et al., 2005). For a cross-organisational service delivery process, organisations can use Web services to compose an overall service process. Technical solutions for this are provided by means of business process orchestration or choreography, but have their limitations (Barros, Dumas, & Oaks, 2005; van der Aalst, et al., 2005). In the SOA paradigm, Web services provide the components of a business process and match it to the technical implementation (e.g. Fremantle, et al., 2002).

The power of structuring thinking in terms of dependencies is in the possibility to identify and implement mechanisms to coordinate the dependencies in processes (Malone, et al., 1999). There is, however, an enormous variety of alternative coordination mechanisms for each or multiple of the already diverse set of types of dependencies. Furthermore, these mechanisms vary from rather specific to quite general.

To provide a few examples; the modes of coordination identified in Thompson (2003) (i.e. hierarchy, network, and market) employ coordination mechanisms such as command (hierarchy), cooperation/consensus (network), and competition/price (market) (G. F. Thompson, 2003). Adler (2001) (also mentioned by Thompson) uses the term community instead of networks and identifies authority for hierarchies, trust for communities, and price for markets as the key coordinating mechanism.

Furthermore, the basic types of dependencies as identified above, are also accompanied with a number of exemplary specific coordination mechanisms, such as make-to-order vs. make-to inventory or just in time vs. advanced planning for the flow type of dependency, and first come/first serve, budgets, and market-like bidding for the sharing type of dependency, to name a few of the many examples discussed in the various articles and chapters bundled in Malone, Crowston, and Herman's edited book *Organizing Business Knowledge* (Malone, Crowston, & Herman, 2003) (the earlier mentioned articles by Malone et al. (1999) and Malone and Crowston (1994) are also chapters in this book).

These examples illustrate that coordination mechanisms can be rather generic or rather specific, but even the more specific ones focus on managing interdependence between actors (such as departments, as depicted in Thompson 1967) or activities (cf. Malone & Crowston, 1994; Malone, et al., 2003). However, the definition we borrowed (and slightly adapted) from Thompson (2003) speaks of the elements in a system. Such elements may include the inter-personal level, for which trust is an important

mechanism of coordination (Adler, 2001), but could also include other layers. There are different views on coordination, resulting in a rich library of potential coordination mechanisms. Some are more structural (e.g. bureaucracy), whereas others are process oriented.

When overviewing this literature on interdependencies and coordination, there are – broadly speaking – two strands: a high level perspective on the organisational arrangement, and a more detailed, but narrow, view, focused on the interdependency between the activities or functions in a cross-organisational process.

With respect to the broad view; networks can be positioned between hierarchies and markets (Powell, 1990; G. F. Thompson, 2003). In the ideal types, hierarchy coordinates by administrative means such as rules and bureaucracy, whereas markets use mechanisms such as price and competition. Networks are somewhere in between, with mechanisms such as trust and mutual adjustment. This is a very high-level view on coordination, with hierarchy, network, and market as generic forms of coordination.

To realise goal-oriented coordination, more specific coordination mechanisms are required. Such mechanisms are, for example, found when a more narrow definition of coordination is used, such as the often used definition of coordination as "managing the dependencies between activities" (Malone & Crowston, 1994, p. 90). While this seems a broad definition, its main focus is on the activities, such as steps in a process or product (components) in supply chains. From that perspective, the dependencies that need to be managed in public-private service networks are those between the activities that each of the partners in a service network performs in order to deliver a joint service. The process that runs through the service network often has the focus of the coordination between the actors in the network.

3.3.3 Theoretical problem

The problem with the two perspectives on coordination discussed above is that the first is too generic to provide insights in the specific interdependencies that occur when public-private service networks jointly deliver public services, which includes e.g. operational processes and the sharing of data. In other words: whereas trust between parties is an important element in dealing with the interdependencies between the actors in a network, it does not tell much about – for example – how two actors provide interdependent functionality and exchange outcomes and data thousands of times a day, using shared resources. The second perspective, which focuses on orchestrating the cross-organisational process, provides more detail on this issue by e.g. detailing basic types of dependencies between activities and resources (e.g. Malone & Crowston, 1994; Malone, et al., 1999). However, this view is too narrow as it does not respect the complexity of the interdependencies in a

network of public and private organisations, such as dealing with the autonomy of the actors, the variety of stakeholders, and the potentially conflicting interests and values. In a network, such complex forms of interdependence cannot be dealt with by subsuming the operations under hierarchy.

As a result, these perspectives do not provide sufficient insight in the coordination of public-private service networks. The structural character of the joint execution of service delivery by public-private service networks increases the coordination challenge over public-private collaboration for incidental projects or the complete outsourcing of tasks. To reach the goal of this research, we thus need a better understanding of the coordination in public-private service networks. For this, the complexity of the interdependence that poses the coordination challenge must be understood. Therefore, in the next chapter, we explore which elements of these networks require coordination. For this, we use a coordination lens in the sense that we seek to identify the interdependence.

3.4 Summary and conclusions

Coming from a bureaucratic structure and hierarchical forms of governance and coordination, the information age has pushed many government organisations to realise an online presence, make services available online and to make use of a wide variety of information systems. However, much of this effort has been uncoordinated, resulting in a complex landscape of services, systems and organisations that resemble the fragmentation that marks the organisational structure of many government agencies.

Information and communication technologies are seen as an enabler to help organisations in the external orientation that comes with a focus on governing by networks and cross-organisational service delivery processes. Cross-organisational service delivery involves interdependencies that cross the boundaries between organisations and, in case of public-private collaboration, also the boundaries between the public and the private sector. The public sector situation of fragmentation, autonomy, and functional silos add to the complexity of a multi-organisational setting.

Fragmented and function-oriented organisations are not equipped to deliver improved public services that have the interest of the service consumer in mind. To combine tasks and processes – needed in order to provide integrated services – public organisations need to collaborate, both with other public agencies and with organisations outside the public sector. Private parties increasingly play a part in a network of actors that provides public services. However, whereas the New Public Management movement envisions a major change in government operations with a large role for the private sector, the actual developments are less revolutionary.

Service delivery and other government operations do change, but are still rooted in Weberian elements. There is an increased role for the private sector, but instead of a partial replacement, the private sector is a collaborative partner of governments to realise public goals, such as integrated service delivery.

Service delivery processes are not limited to the service offerings of the public sector, nor do they comply with the fragmented structure of the public agencies involved. The inter-organisational component cannot be addressed at the policy and managerial level alone, as is often done by focusing on mechanisms such as contracts. Often, governments have not developed instruments for managing the "indirect tools" (i.e. actors outside the government) that it increasingly relies on (Kettl, 2002, p. 492). Government programmes are only as strong as the partners; "a weak link anywhere along the service chain, even if the weak link is far outside government's halls, undermines the effectiveness of public programs" (Kettl, 2002, p. 492).

In the first two sections of this chapter, we have explored literature on the concepts underlying public-private service networks. Such a constellation of organisations introduces a variety of organisations, with different goals, interests and values, a different organisation structure and different internal and external governance structures. Furthermore, organisations have different systems that sometimes operate within a fragmented organisational structure. As a result, the challenge of coordinating cross-organisational processes, needed for executing joint service delivery, is expanded with the challenges that come from the collaboration between sectors. In public-private service networks, the public-private relationship does not go as far as in pure outsourcing, but is collaboration for the execution of service delivery while warranting public values. Thus, whereas there is literature on outsourcing and public-private partnerships, this literature often has a strong sense of that the government parties pay and the private parties perform. Literature on public and private parties collaborating in networks to realise joint service delivery is, however, scarce. Furthermore, the literature proposing collaboration between public and private organisations to realise public goals and value does not provide concrete suggestions as to how the interdependencies that arise in the action (e.g. the joint provision of services) of such collaborations have to be coordinated (e.g. Denhardt & Denhardt, 2000; Stoker, 2006). Although this literature is good at substantiating the general developments and direction towards collective public-private action, such as integrated service delivery, it's lessons and findings are too generic to tell how such action has to be coordinated in the practice of enduring, ICT-supported, interactions between a diversity of parties. This was the research problem we started out with, in chapter one. This dissertation aims to fill that gap.

We found that the concept of public-private service networks fits the idea of increasingly offering integrated services and collaborating with the private sector.

Furthermore, this chapter has shown that such arrangements are not as easily realised. In this chapter, we thus affirm the gap identified in chapter one, as the literature does not provide concrete directions on how the elements in a public-private service networks have to be made to act together, i.e. coordinated. In this theoretical background, we also identified a gap in coordination theory, due to which that theory does not address the gap.

Therefore, the main theoretical problem was identified in the third section of this chapter, in which we discussed the theoretical background of coordination theory. By coordination, we mean that the interdependent elements in a public-private service network are dealt with to enable them to act together. However, as put forward in our description of the theoretical problem in § 3.3.3, the coordination view from literature is too limited as it either focuses on high-level coordination between organisations, thus foregoing on the executive character of public-private service networks, or focuses on the interdependencies within the process execution and does not incorporate the complicating socio-organisational factors. The gap in theory is that the coordination views do not deal with the complexity of the interdependence in public-private service networks. To understand interdependence and coordination in public-private service networks, we first need to identify the interdependent elements in public-private service networks; the coordination challenge. This is done in the next chapter, which is the first of two empirical steps in this research. The second step discusses how actors deal with that coordination challenge, thus how they coordinate.

Our first *theoretical proposition* is therefore that we need to assess the coordination challenges and mechanisms on multiple layers and look at how high-level coordination impacts the specific coordination of public-private service networks, and at the same time see the specific coordination as being part of a broader setting.

Furthermore, in our literature review, we found that public-private service networks focus on the collaboration between the two, whereas in much literature on public-private partnerships and organisational forms, the focus has been on the distinction between the two. Hierarchy and market were conceptually different in public management, but are now coming together in public-private networks. The public sector is traditionally attributed hierarchy as the basic form of organising, with command and authority as its main mechanisms (Albrow, 1970; Ho, 2002; G. F. Thompson, 2003). Public sector reform movements argued against this, based on the argument that government organisations are inefficient and ineffective and should operate more like businesses do (e.g. Osborne & Gaebler, 1992). Market-like strategies, based on price and competition, should be employed to improve the operations and government should focus on its core tasks, leaving the rest to the private sector (cf. Beynon-Davies, 2007; Dunleavy, et al., 2006; Hood, 1991; Osborne

& Gaebler, 1992). This New Public Management (NPM) movement was not without criticism. Its critics focus primarily on a fundamental difference between the public and the private sector. The post-NPM scenarios and ideas vary quite a lot, but most of them agree on that collaboration with private parties and other levels of government is seen as a way for (central) governments to improve the level and/or the efficiency of public service delivery and other government tasks (e.g. Bertelli & Smith, 2010; Fountain, 2001a; Heinrich, et al., 2010; Kamarck, 2007; Kettl, 2006; McGuire, 2006; Milward & Provan, 2000; Provan, et al., 2004; Salamon, 2002a; Selsky & Parker, 2005). Thus, instead of a clear separation between hierarchy and market; public versus private, the contemporary literature for public management focuses on public and private, in collaboration ideally to complement each other.

As public-private networks comprise organisations adjusted and accustomed to both basic forms – hierarchy and market – there is a tension in such networks as these forms may clash. We see this in theories on public management in which private parties play a role. For example, Milward and Provan (2003) argue that cooperation, relational contracts and clear principal-agent relationships are important. The principal thus delegates work to the other, governed by contracts. Both hierarchical and market forms are present, while the focus is on networks. They recognise that there are two implicit theories of networks, one focused on (competitive) contracting, and one on integrating services, e.g. by providing a continuum of care (Milward & Provan, 2003). This latter form is consistent with the many articles arguing that the collaboration between the public and the private sector is a means to realise public values and not a potential threat to those values, as identified by some studies on Public-Private Partnerships (e.g. Flinders, 2005; Pongsiri, 2003; Rosenau, 1999). In public-private partnerships, the mode of coordination is often based on price, competition and formal contracts and agreements as the main coordinative mechanism. In networks, the coordination mechanisms are said to be more permissive and based on relationships. Trust, mutuality and consensus are the main mechanisms of coordination (e.g. Adler, 2001). In public-private service networks, the three main forms – hierarchy, network and market – come together.

Our second *theoretical proposition* is therefore that in public-private service delivery, networks are not a new and unique form of organising, but co-exists with hierarchical and market-type forms. As these forms provide different directions on how to deal with partners in the inter-organisational environment, we need be aware that the partners in a public-private collaboration may have a fundamentally different approach to dealing with the others.

4 Explorative study: coordination challenges

"Demand-driven service delivery means that when you buy a shirt, you're also offered a matching tie"

- independent government expert in the explorative study -

In the theoretical background of public-private service networks, discussed in the previous chapter, it is clear that the operations of government agencies increasingly rely on collaboration with other organisations in networks. Furthermore, in e-government literature, ICT-enabled public service delivery moves towards offering integrated services by multiple service providers, for example by joining-up services in online portals. The interdependencies that exist in such arrangements are not entirely clear and literature on coordination only provides high-level mechanisms, such as authority or trust, or specific dependencies and mechanisms at the process level which focuses on the dependencies between the activities that together make up a process. However, the elements in a public-private service network that are interdependent do not only include process steps, but also information systems, organisations, and actors within those organisations. In order to realise concerted service delivery, these elements have to be considered as well.

In this chapter, we describe an explorative case study in the context of an integrated electronic service delivery portal. In § 3.3, we argued that from a coordination perspective, public-private service networks could be seen as a system of interdependent elements. To assess the coordination challenge in these networks, we need to identify and describe the elements that are interdependent. In this chapter, we explore the interdependent elements in practice, more specifically a feasibility study on the development of an electronic portal for the provision of electronic services, operated by a network comprising both public and private actors.

As public-private service networks are a relatively new phenomenon, the initial empirical ventures on this topic therefore need to be extensive, providing a rich and in-depth description of the coordination challenge in public-private service networks. This case described in this chapter is used as a revelatory case, for which we employ an explorative case study method (Yin, 2009). The case concerns a research and technical development (RTD) project, aimed at the design of integrated electronic service delivery by organisations from both the public and private sector. We describe the background of the case study first. Then, we provide an integrated description of the case and the complexity of the situation of interdependence. We describe and analyse the case in terms of the three layers identified in chapter one: the organisational setting, the process, and the use of ICT. The interdependencies identified in this case are related to these layers, which are thus a sort of main sources

of interdependence, and identify the coordination challenges for these interdependent elements. Based on the description, we discuss the coordination challenges found in the study, structured by the same three elements.

Parts of this chapter draw on, or have been published in: (Klievink, Derks, et al., 2008; Klievink & Janssen, 2008a, 2009b; Klievink, Janssen, Lankhorst, & Van Leeuwen, 2008).

4.1 Background and context of the case study

Public organisations collaborate with other government actors and with private parties in networks to accommodate the changing demands of society. The Netherlands – the country where this study is situated – is no exception. As in countries, the Dutch government has for several years put a focus on improving the service level of the public sector, including efforts to provide electronic and multi-channel services. Furthermore, the agencies involved had to be readied for (electronic) cooperation to facilitate the cross-organisational service delivery that is needed to provide integrated, demand-driven services to citizens and businesses. Organisations must share information to avoid asking citizens the same information over and over again, and to create greater efficiency and less duplication in back-office processes and systems. This requires concerted effort of many organisations (Lips, et al., 2005).

Despite the efforts and despite the large number of Dutch citizens that visit government websites, the actual usage of Dutch e-services is lower than expected (Van Dijk, Pieterson, Van Deursen, & Ebbers, 2007). Furthermore, the service delivery of government is not perceived to be improving by citizens, and scores are lower than the government aims for (i.e. the score is under 7, on a scale ranging to 10) (Kanne, Klasema, & Bijlstra, 2009). There is thus room for improvement. This improvement, however, has to go beyond just making the same services available in more channels. As we also found in the theoretical background, most (e-) government services are based on the current organisational structure and products of the various governmental institutions, resulting in a fragmented and ill-coordinated patchwork of services (Lankhorst & Derks, 2007). In case citizens or businesses require interactions with government, the citizen or business often has to deal with many partial services offered by multiple organisations or departments, each focused on their own activity and function.

These issues were recognised by several large government agencies and private organisations in the Netherlands. They observed that government services should be based on actual service consumer demand and that cooperation is necessary to meet those demands (Lankhorst & Derks, 2007). Demand driven e-government service delivery requires an integrated approach of technical and organisational issues,

leading to the creation of "virtual agencies" (Fountain, 2001a). This observation resulted in a joint research initiative with partners from government, academia and business. The project aims at establishing requirements and solutions for public-private service networks that provide integrated, demand-driven electronic services. Private parties complete the public sector service offerings as to facilitate the service demand and processes of the service consumer. This research and technical development project aims to understand and demonstrate the feasibility of a demand-driven electronic portal.

To achieve its goals, the project resulted in a large number (circa 50) of deliverables on a wide range of topics related to the creation of an electronic portal for demand-driven and integrated service delivery. In this chapter, we only discuss the findings related to our research. Other topics of the project, but not discussed here, include user acceptance studies (e.g. Van Velsen, Van der Geest, Ter Hedde, & Derks, 2009; Van Velsen, Van der Geest, & Klaassen, 2006) and the developments and full specification of an architecture for this portal (e.g. Lankhorst & Bayens, 2008; Lankhorst & Derks, 2007).

4.2 Case description and analysis

The starting point of the electronic portal under study is the service process of a service consumer, as the project aims to offer integrated services that match this service demand. For our purposes, we define the service process of a consumer as the process a citizen or business (the service consumer) goes through in which the service consumer interacts with at least one government agency. The portal aims to offer the activities that are performed for the service consumer's process in an integrated fashion. From the perspective of a service consumer most service delivery processes include, but are not limited to, service offerings from government organisations. To provide an example that we will more thoroughly describe later on, when a citizen loses his or her job, applying for temporary income at the social security agency is only one of several steps that need to be taken. Other organisations that may have to be contacted include the local municipality, the tax administration, and potentially a re-integration bureau, that assists people in finding new jobs. Of course, the specific process for each service consumer varies per situation.

4.2.1 The organisational setting

In § 3.2.1, we discussed two theoretical models for managing public-private networks: creating a continuum of care by integrating services from various providers, and competitive contracting. For the portal in this exploratory case, two scenarios were developed to provide conceptual cases for the proof of concept of the portal. Concepts related to these theoretical models can be found in the scenarios. First, a *social support scenario* allows service consumers to select a social support provider (the

focus of the scenario is on providing a home help service) among a number of providers. Since prices may vary and the government covers a portion of the expenses, this model facilitates a mild competitive model although – consistent with contemporary theoretical views – the aim is not so much to reduce prices but to improve the value of service delivery. We thus say mild because the scenario is aimed at giving the service consumers a choice and not directly to have private providers compete with each other in order to lower costs. The user scenario and requirements of this case are more extensively described by Van Velsen, Van der Geest, Ter Hedde and Derks (2009). The second scenario is on *work re-integration*, where the different actors involved collaborate to provide a continuum of care for people that have lost their job and are assisted to find work (this scenario is discussed and adapted in Klievink & Janssen, 2009b; Klievink, Janssen, et al., 2008).

4.2.1.1 The organisations in the social support scenario

In 2007, the Dutch government introduced the Social Support Act (in Dutch: Wet Maatschappelijke Ondersteuning, or WMO). This act replaces a number of other acts on social support and aims to assist people with (temporary) special needs to participate in society. The focus of the act is on mitigating hurdles in and around a person's house, in getting around locally, and in meeting other people. Municipalities are responsible for providing support and tools for the people eligible for it, for example in the form of the provision of wheel chairs or a house help (Rijksoverheid, 2010).

In the context of the social support act, the social security facility of home help for people that cannot fully take care of their housekeeping themselves has been decentralised to the municipalities. As a result, the implementations of this act may vary per municipality. This scenario focuses on applying the ideas developed in the project in a new portal initiated by the City of The Hague, one of the partners of the project. The City of The Hague sees public-private service networks as a powerful means to provide demand driven, integrated services to citizens. This is demonstrated by the City's initiative to start Residentie.Net, an internet portal for its citizens, aimed to connect them to public and private services in one portal. This portal supports citizens of The Hague in acquiring and managing a personal budget they can acquire to fund house help. Given the goal of the project, the citizen is an important actor in the scenario. Furthermore, the following public and private organisations are involved in the network included in the scenario:

- *City of The Hague*: The Hague is the seat of the Dutch Parliament and serves as the International City of Peace and Justice. As a municipality it is responsible for the implementation of the social support act, including household care;

- *Residentie.Net*: Residentie.net is a public-private partnership for creating a digital portal for the community of The Hague. The mission of Residentie.Net is to connect citizens of The Hague to public and private parties to encourage use of public and private facilities;
- *Centre for care entitlement (Centrum indicatiestelling zorg: CIZ)*: In 2005, the Dutch government established a centre for assessing care entitlements of citizens based on objective criteria to establish equal treatment in the whole country. Upon request by municipalities, it provides social-medical advice related to the social support act. CIZ is positioned as an independent gatekeeper for publicly funded care. As of October 2008 (after the conclusion of this exploratory case study), an independent division of CIZ is responsible for the services CIZ provides in the context of the social support act: CIZ MO;
- *Social Security Agency (Sociale Verzekeringsbank: SVB)*: SVB provides services to holders of a personal social support budget to reduce their administrative burden. SVB is a large organisation; performing services to almost five million clients (The Netherlands has 16.6 million inhabitants);
- *Dutch Tax and Customs Administration (Belastingdienst)*: The tax office provides income details which serves as the basis for the personal budget;
- *Care providers*: Private organisations that offer house help services. This may vary from sole proprietorship to large organisations to temporary staffing firms.

Note that the scenario provides a selective view on the real situation, picked to demonstrate the electronic service delivery through the portal. In practice, these organisations are also part of other networks and other organisations interact with this network. Furthermore, in practice, networks can have a different composition. For example, not every municipality uses the services of the CIZ as some establish care entitlement themselves. In that way, they have more control over the care entitlements and, consequently, over the costs of the social support act.

4.2.1.2 The organisations in the work re-integration scenario

The second scenario developed for implementing a conceptualisation of the portal is focused on a citizen who was employed for some time but now lost his job. As he has no perspective on finding a new job soon, he – in the scenario – uses the portal to interact with the various parties involved in his process from applying for unemployment benefits to finding a new job. This scenario is useful to describe a complex setting with multiple organisations working both individually and together for the same service consumer. In our discussion of the cross-organisational process, we will further detail this reciprocal pattern of interactions. The organisations involved in the scenario are:

- *The local municipality*: Provides information from the nation-wide, but locally maintained, municipal population registration, or civil registry (in Dutch: Gemeentelijke Basisadministratie Persoonsgegevens, or GBA). This information is required for further interactions with government

organisations. To gather this information electronically, the citizen has to sign in using DigiD, the Dutch collective digital authentication system for government authorities. Furthermore, municipalities collaborate with the UWV to assist unemployed citizens;

- *UWV (Dutch abbreviation of Uitvoeringsinstituut Werknemersverzekeringen)*: UWV is an autonomous administrative authority and is commissioned by the Dutch Ministry of Social Affairs and Employment to administer several insurances, including unemployment. Employment is one of the core tasks of the UWV, for which its ambition is to help citizens remain employed or find employment, in close cooperation with the municipalities;
- *Re-integration bureaus:* In the process of helping people to re-integrate in the job market, private re-integration bureaus assist people in finding out what they need to improve their qualifications for job openings as well as finding work;
- *Course or schooling provider*: In case additional schooling is necessary, courses can be taken or people can be (partially) retrained at the expenses of the government. The goal is that people with limited or no prospect of finding work are educated for the type of work there is demand for;
- *Employers*: Ultimately, the schooling and job search process is aimed at finding a new job for the unemployed. Employers offer job openings and are the end point in the process in the scenario we look at. There are also situations in which the governments offers a subsidy or other forms of support to employers that hire people with a certain job handicap, in which case the interactions between the citizen, the employer and government agencies continues, but this is beyond the scope of this scenario;
- *Employment intermediary or website*: To match demand and supply in job openings and potential solicitors, intermediaries such as employment websites play a role.

4.2.1.3 Crossing boundaries between public and private organisations

In both scenarios, the service consumer's process spans multiple organisations and crosses the boundary between the public and the private sector. The portal is aimed to be demand driven and to therefore electronically facilitate the process of the service consumer. This requires the inclusion of relevant private organisations. These partners in service delivery contribute something to the service offering of the portal and thereby relieve the service consumer of the burden to identify required or optional steps in service delivery and to contact private organisations that perform those steps in the overall process. Thereby the private parties improve the overall quality of the service by adding functionality or by completing a chain of related services. For the latter, the services of public providers have to be integrated or joined-up with the services of private organisations, thus, realising a one-stop-shop.

Although partnering with private organisations offers the possibility of better facilitating the service consumer process by offering services of multiple parties in one place, cooperation with private organisations is a challenge as the actors involved

have a certain degree of autonomy, may have different goals and values, and have to address accountability concerns. We discuss the concerns that have come up in our research each in turn.

Autonomy of actors

The organisations involved are all relatively autonomous. The re-integration bureau depends on the contracts awarded by the government organisations, but has found a way of handling its interactions with the government organisations in the past. The portal is not developed in a green field situation; there is a way that organisations are operating without the envisioned portal. The same goes for the government organisations themselves. The municipality and social security agency are already able to collaborate in order to perform the tasks they are required to do, although not electronically and driven by the functional structure of the organisations instead of by the process of service consumers. Furthermore, the service delivery chain could also include private parties that do not rely on the government for their primary process, such as employment websites.

Given this status quo, a portal aimed at providing integrated and demand-driven services poses a multi-actor problem. Organisations have to develop a portal that is able to accommodate each partner, technically, but also in the goals and interests of each organisation. Improving service delivery by providing online portals is a goal of the government. More specifically, in this case it is the goal of the central government. However, municipalities have limited budgets and a large number of public tasks to fulfil. Furthermore, as described in the theoretical background, these organisations often focus on integration within the organisation, for example to provide a single website for the organisation. In the situation of a municipality, this development can conflict with a (national) strategy of cross-organisational integration of services, as it is not the entire municipality that is active in the unemployment service chain, but only one or a few specific departments. This results in a situation in which a (large) number of departments within a municipality (or any other organisation) have to comply with the integration efforts within the organisation, but individual departments also have to comply with their domain specific inter-organisational portal (such as one for re-integration in the job market) whereas another departments in the same organisation have to collaborate in other networks, potentially for another portal. This is consistent with the theoretical proposition that in public-private networks, the networks do not replace hierarchy, but comprise actors that deal with different forms of coordination within and between the organisations.

For the social security agency, the form is different, but the issue is essentially the same. The agency is a so-called executive organisation, which has a semi-independent standing within the Dutch government. Such organisations provide public tasks, often

with public funding, but do not fall under the authority of a ministry. A ministry at the national level may develop a strategy of setting up integrated service portals for government functions, for example in different domains. The ministry does not, however, have the authority to force all public organisations into joining the portal. Furthermore, government organisations – independent of their degree of autonomy – have designated tasks and limited budgets to fulfil them. The question then is who is responsible for developing, maintaining and funding a new service portal, apart from the existing structure that organisations have in place for communicating with citizens and businesses. Also, as organisations have existing structures and systems in place, the way they should interconnect with such a portal cannot always be prescribed. Finally, as these organisations often depend on a political mandate, they may resist collaborating in the portal in fear of losing visibility to the public by joining-up with other organisations in a single portal.

Goals and values of actors

When looking at the private organisations, the incentives for cooperation are also an issue, perhaps even bigger. In the example, re-integration bureaus that have sufficient work have little to gain with offering their services through a portal in competition with similar service providers. The current situation works for them and new developments may contribute nothing while they risk losing clients to competitors. Also, for the private parties it may be beneficial to focus their service delivery to a specific segment of service consumers that is likely to yield the highest revenue. Government agencies, however, have the responsibility to warrant that everyone entitled to a service is served.

Furthermore, as governments need to provide a fair opportunity for every private organisation providing the same service, the portal needs to be open to many potential providers. In a portal based on the competitive contracting (see § 3.2), every provider of the service out for contracting should – in principle – be able to join in on the portal. The portal has to facilitate this. However, as the individual (private) providers cannot warrant the entire process, it is up to a government organisation to ensure that the task that the network of organisations is required to do is realised and public values are safeguarded.

Accountability and responsibility

In cross-agency service-delivery processes, allocating accountability for the joint service is a challenge (Gortmaker, Janssen, & Wagenaar, 2005). Networks have to specify the roles and responsibilities of the parties involved. Furthermore, it must be determined who is accountable for failures such as exceeding lead-times. It also extends to determining which partner can provide accountability information to stakeholders, if necessary. It should be specified which actor takes the lead and which

actors is responsible for monitoring the cross-agency process and the quality of the services provided.

Maintaining transparency and accountability is a challenge especially when including private partners. In the theoretical background we found that a focus on public service delivery by public-private service networks may lead to costs on democracy and equity (e.g. Flinders, 2005; Rosenau, 1999). One of the core aspects of democratic governance is the ability to hold public officials and government agencies responsible for the fulfilment of public tasks such as service delivery (Rosenau, 1999). Therefore, public-private service networks should also be held responsible for the performance of these networks. However, there is some evidence in our case that the costs for public-private service networks are largely allocated to the public partners. In the literature it is argued that this applies to the allocation of responsibility as well; if public-private service networks fail, the democratic costs are 'paid' for by government (Flinders, 2005; Rosenau, 1999). We found that it is therefore necessary to clearly allocate responsibilities in a public-private service network, for example through specifying roles (Janssen, et al., 2006).

4.2.1.4 Organising the network

Based on the goals of the project and the scenarios designed in the study, three archetypical forms of organising the network were identified:

1. A government agency leads the network by setting the requirements (e.g. as set by law) and the frame wherein other organisations can function. A prerequisite for this is that the requirements and frame is realistic and attainable for the organisations involved in the service network. To illustrate that this can be an issue; in the second scenario the leading government organisation could require of large re-integration bureaus to maintain a detailed administration per case, whereas it is unrealistic to burden individual care providers (i.e. a house help that offers services in a sole proprietorship) in the first scenario with similar administrative requirements. Within the frame provided by the leading government agency, other organisations can offer their services. In government there is often one provider of a specific service (or several that each covers a specific area, e.g. municipalities). For private organisations however, several organisations can offer their services in either a continuum of care or a competitive contracting model. The service consumer can make the choice for a specific private service provider as long as the service providers abide by the frame that the leading government agency has set. In case a service consumer is not able or willing to choose, a government actor needs to facilitate this.
2. A limited number of service providers lead the network, for example through a network administrative organisation or another governance regime set up by a

government agency and (private) service providers in a leading role (cf. Kenis & Provan, 2009). The regime combines the accountability and authority of the government partners with the domain specific expertise of the (private) service providers. Smaller or new service providers will have to abide by this regime in order to play a role in the service provision.

3. There can be a situation in which there are only a very limited number of service providers and there is no desire or (legal) opportunity to open up for others. In such cases, the government works directly with a specific service provider. The governance of such collaborations focuses on bilateral agreements on the joint approach to service delivery to ensure a seamless process flow over the parties involved. However, this does not qualify as a service network.

Independent of the way a network is organised, governance, agreements and management are important tools to deal with the interdependencies between organisations. However, as we will see in the next section, the joint action of these networks goes deeper into the operations of the organisations involved.

In both scenarios we found that although the organisations mentioned above did represent a participant in the project, departments within those organisations provide the actual services for each of the specific scenarios. For the large executive organisations such as the UWV and SVB, the services they contribute in the chain are one of a few major services and tasks they have to provide, as set by law. The municipalities, however, often provide hundreds of services, performed by a large number of departments within the municipality. For the services that are provided in the scenarios through the electronic portal, only one or a few departments are involved. The issue here is that the municipality is managed as an hierarchical organisation, while the development of portals (or other means of integrating or joining-up services) has to include one or a few departments, which then have to focus on both operating within the hierarchy of the municipality, and in the service delivery network. Within the scope of the research and technical development project, this is doable, but the participants indicated that this might become a problem if a large number of departments in the municipality start participating in different service networks. The focus on service integration and the network structure that goes with it is expected to provide friction with the hierarchical organisational structure of some government organisations.

4.2.1.5 Trust between partners

As we have described, differences in interest may occur between public and private organisations. For example, businesses' objective is making profit, while governments use public money to achieve public goals. Another example is transparency; businesses may want to disclose the least information possible in order to keep or

gain a competitive advantage. Public organisations on the other hand must be transparent. These types of conflicts of interests cannot always be avoided; they have to be dealt with. A mechanism is needed to govern cooperation between public and private partners in order to cope with conflicts of interests. One way to achieve this is by reducing conflict potential and allowing partners to develop trust relationships. In the case, we found an importance of trust between partners, both public and private, but also that trust may be difficult to establish.

One important example of this is that both public and private parties favour a global over a federated authentication service for citizens. A challenge that service providers face in case of federated authentication is a lack of trust of the authentication by other parties than the authenticator. Both government and private parties would like to adopt a global authentication service. For the Dutch government, such a global authentication service exists and goes by the name of 'DigiD'. A problem with the current global authentication facility is that private parties are not allowed to use it. DigiD can only be used for authenticating a citizen for government services. Currently, a large number of government organisations use this service, which is based on the initiatives of several large government agencies in The Netherlands. Another problem regarding a global authentication service are concerns on availability, most notably the concern of private organisations that they become too dependent on the central authentication service for their service provisioning. Therefore, despite the preference for global authentication, federated authentication is still present in some organisations and single authentication remains a challenge due to limitations of the mechanisms used and insufficient trust of other's authentication service.

The considerations not to trust authentication services of third parties are also seen in the context of authorisations. Organisations are reluctant to trust authorisation services by other parties, for example because of the responsibility public institutions have with respect to citizens' privacy. Important mechanisms to enable the service network to build relationships based on trust are security mechanisms in e.g. authentication and authorisation services, certification and verification functionality.

4.2.2 Cross-organisational service delivery process

The starting point of this case study was the analysis that from a service consumer's point of view, service delivery processes often cross the boundaries between organisations and that the burden of managing the steps at various service providers rests on the service consumer. The aim of the demand driven portal is to relieve the service consumer of this burden and make it the responsibility of the joint service providers to manage the steps in the overall service delivery process.

4.2.2.1 Process orchestration

From the service consumer perspective, the service-delivery processes consist of various services and activities at multiple organisations, both public and private. In the social support scenario, the service consumer has to gather information from the Tax and Customs Administration, which is required to apply for social support and the assessment of entitlement by the CIZ, which in turn is the basis for a contract with a provider of a house help service, for which a certain budget can be used and has to be managed, a task in which the SVB assists. The service process thus consists of a number of activities, often requested and managed by the service consumer. Managing the interdependencies between these activities that together make up a service process is called process orchestration, or orchestration for short. Process orchestration is the goal-oriented coordination of components (i.e. activities of service providers) by a single responsible entity in a cross-organisational process flow (Janssen, et al., 2006). This responsible entity for identifying and taking all the steps, thus orchestrating the service process, used to be the service consumer.

Government agencies aim to improve service delivery by taking over this orchestration task from the citizen. A portal that aims to provide demand driven and integrated services has to shift the responsibility of managing the various activities involved in the integrated service process as far to the service providing side as possible. This concept of orchestration is quite similar to the concept of coordination as put forward by Malone, Crowston, and others, as described in § 3.3, who define coordination on the layer of managing dependencies between activities (Malone & Crowston, 1994). In integrated service delivery, the task of managing these dependencies shifts from the service consumer to the network of service providers. The underlying idea is that the process of a service consumer often consists of multiple steps, each of which requiring interactions with a government organisation or a business. From the service consumer perspective there are thus multiple organisations involved. The individual services that each of the organisations provide for a process step are only part of the overall process. The service one organisation provides (e.g. provide a document) may be a prerequisite for the next step in the service consumer process. However, the service providers often think only of the individual services they provide, leaving the burden of dealing with the individual service providers to the service consumer. More recently, (government) organisations shift from thinking in the individual tasks or activities they perform to thinking in processes, which often cross the boundaries of units or departments within the organisation. Still, from the service consumer perspective, the process thus also crosses the boundaries between organisations and even between the public and the private sector.

4.2.2.2 Generic process for the social support scenario

In this sub section, the service delivery process flow in the service network operating in a portal for the social support scenario is described. For the work re-integration scenario, the development of the process orchestration and governance was part of a prototype in which the implications of this study were assessed. As such, it was not part of this explorative study, but is described in chapter seven.

In order to research how a demand-driven electronic portal could be realised in the social support case, a prototype of such a portal was developed by The Hague's Residentie.Net and was branded 'WMO-portal'. A typical process consists of the following main steps:

1. *Application*: If a citizen thinks he or she may be entitled to household care, the client can apply for this care using the WMO-portal. The portal features a step-by-step process plan to support the service consumer in taking a number of (sequential) steps;
2. *Check entitlement*: One of these steps is the application for social support. Part of the application is an inquiry after the service consumer's income. The Dutch Tax and Customs Administration can provide this data. Whether the citizen is entitled to care, is decided by the Centre for Care Entitlement (CIZ);
3. *Contract*: If the application is accepted, the service consumer can search for a provider of house help. Once a provider is selected, a formal contract will be made using a template provided by the portal. Both the citizen and the provider can sign the contract digitally using electronic authentication;
4. *Receive and consume care*: House help is provided for the period and amount of care the citizen is entitled to;
5. *Manage budget*: During the period of house help, the service consumer can manage the budget using the portal, where the SVB can assist in the administrative overhead.

The main steps in the cross-agency service process are schematically shown in **Figure 5**. The service consumer passes through the individual steps in the process that is facilitated by the portal. The actors presented in the previous section are also shown; the City of The Hague is overall responsible, Residentie.Net offers the portal and the other organisations are shown in the lower layer, each offering services that are part of the overall process.

The organisations mentioned in the figure are the organisations that are responsible for the service as a whole or for the organisation-specific activities that are part of the joint service delivery process. The actual activities are performed by departments within these organisations, which perform activities for the service consumer and interact with other actors performing activities as part of the joint service. Thus, while the process looks straightforward, practice shows a more complex structure of nested tasks, fragmented responsibilities and operations. Consistent with the literature

described in §3.2, organisations are not only part of a network, but can also internally consist of networks of professionals and departments.

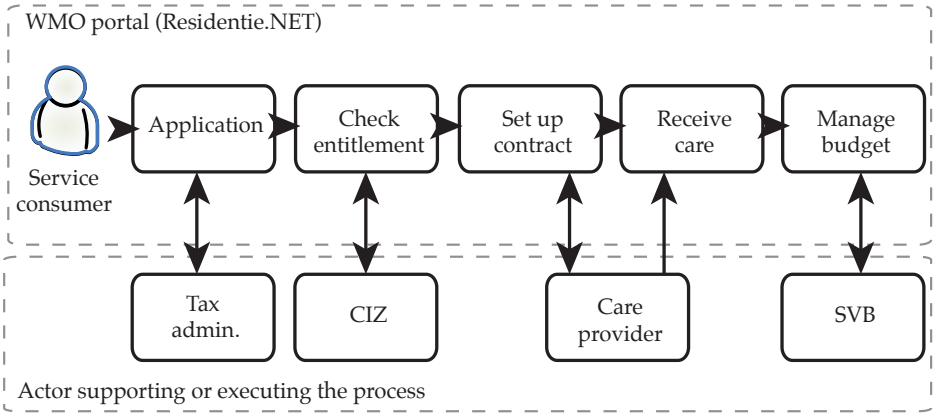

Figure 5: **generic social support process flow from the perspective of the service consumer**

4.2.2.3 Sequential and reciprocal process flows

The process in the social support scenario assumes a linear, sequential flow, in which every activity in the process flows from a previous step and precedes a next step. The services that public-private networks provide can be seen as cross-organisational business processes, which combine activities or sub processes performed by each of the partners, similar to supply chains in logistics. These processes can technically be realised through business process orchestration, as described in § 3.2.2. Such process orchestration assumes that cross-agency processes can be centrally orchestrated. In our cases, however, the situation is more complex. For various parts of the process there can be different orchestrators, i.e. an entity responsible for orchestrating a process. Moreover, there can be a nested structure in which an orchestrator coordinates sub-processes that are each managed by their own orchestrator.

For the social support scenario, the number of possible variations in the process is limited and the sequence of the process steps is more or less fixed. Such cross-organisational processes are thus predictable. As the expected process flow can be specified before the process is executed, process orchestration (with a single entity in charge) or process choreography (without such an entity) can be employed to compose and perform the cross-organisational process. With respect to the theoretical description of interdependence in § 3.3.1, the type of interdependencies that exists in such process flows is sequential.

However, in the re-integration scenario, the process flow in the network is not as decomposable in discrete, sequential steps, which are each taken by one of the

organisations involved. The activities that are involved depend on the specific situation of a service consumer; one individual may require only temporary income, a short talk with a re-integration councillor and a job website, whereas another might require various iterations of talks, additional courses and training before being able to find a new job. In this case, demand-driven processes do not only involve multiple (semi-) autonomous organisations, but may involve them in changing, dynamic configurations. Therefore, the process flow cannot be defined extensively in advance and is unpredictable until the service is actually provided. The design of the portal needs to be able to accommodate the variation and thus needs to be very flexible. This requirement of flexibility extends to the coordination of the public-private service network that provides services, whether through a portal or not. With respect to the theoretical description of interdependence in § 3.3.1, the type of interdependencies that exists in such process flows has reciprocal character.

Furthermore, the composition of networks is not necessarily static and may change over time. Consequently, the requirement of flexibility extends to adding new actors to the network and removing existing ones without failing to provide the integrated service. Flexibility needs to be accommodated both by the technology used for integrating service components, and by organisation and governance principles and conditions. These two sides may contradict. For example, an intuitively appealing governance principle is that one partner must not be removed before there is a suitable replacement. However, this could conflict with the autonomy of the private organisations.

4.2.3 The use of ICT

The social support scenario was the first scenario designed and used in the study of the conceptual demand-driven portal for integrated service delivery. The technological support for the portal in this scenario was based the SOA paradigm in Information Systems. The focus was on business processes and the automation thereof, driven by the technological developments and the need for improving the efficiency of processes (van der Aalst, 2003). The coordination of inter-organisational processes has received research attention from the workflow and SOA perspectives (Janssen, et al., 2006; van der Aalst, 2000). As described in our discussion of the challenge of coordinating information systems, processes are built from smaller components, called web services. The overall service and its relation to the underlying web services are realised using a WS-BPEL (Web Services Business Process Execution Language) process definition. A BPEL process specifies a workflow in which a complex service is built from elementary services (Recker & Mendling, 2006). BPEL is widely supported and is seen as a standard in the area of composing business processes from web services (Peltz, 2003). The large number of software packages also illustrates this; at the time of the study (2007) we found close to thirty software

packages mature enough for the needs of the portal. Even when we applied strict selection criteria, a number of applicable software suites remained.

However, a workflow approach is not always applicable to the way a process runs in – or through – a network. It is not always predictable how processes run in the network, and thus cannot always be specified or prescribed in advance. This is the case in the re-integration scenario, in which the line of action in the cross-organisational process is less predictable and has a reciprocal character. Such reciprocal interactions affect not just the process level, as the interdependencies also exist among systems and data.

4.2.3.1 Service architecture

In the project, a service architecture blueprint was developed and applied to the scenarios. Lankhorst et al. (2007; 2006) provide an overview of the most important services and functions of the architecture for demand driven electronic service delivery. In the architecture, some services and functionality are part of the shared architecture, i.e. the authentication and authorisation facilities. The actual provision of parts of the integrated service, the adaptation to the demand of the service consumer, and the integration of information from several sources all are examples of functions that are performed by the service providers involved in the cross-agency process. These service providers are the organisations that provide (parts) of the service-delivery. Integrating the various components is done by an application, which in turn may be provided by a third-party. This may be seen as the core functionality of a demand-driven architecture, and therefore under the direct responsibility and supervision of the service consumer (Lankhorst, et al., 2006).

The architecture supports the generic process of the service consumer (the user of the portal), which starts when the user logs-on and is authorised. The user can browse and/or search the directory of services and information and create and update a step-by-step plan. The user can also configure and manage the application, for example to authorise someone for access to the personal file.

4.2.3.2 Interconnecting multiple service providers

The overall architectural challenge is to allow public and private partners to cooperate in a service network. Partners can connect to the architecture by using standardised interfaces developed in the shared enterprise architecture for the portal. To reach the ideal of a flexible architecture for public-private service networks, the interfaces should be uncoupled from organisational processes and systems. This allows partners to plug-in or -out of the service network, in analogy to an electricity network where you just connect using the power plug and – if necessary – use adapters to translate one format in another format. The participants in the study identified a number of notable challenges for interoperability.

Notable challenges include a lack of standardisation, coping with legacy systems and the fact that the organisations all have their own architectures. The directions that the different architectures offer can be conflicting or lack a focus on collaboration. One important example is that of the municipalities. In recent years, some municipalities have started to develop enterprise architecture for the organisation to tackle exactly the problems that are typical for these organisations, namely the fragmented ways of working and information systems. However, the many departments within the municipality are working in various chains and networks, for which they have adapted processes and systems. The architecture for the joint portal thus meets numerous (different) architectures for the numerous municipalities that could provide competing directions for the department that is part of a municipality but working with other government agencies (with still other architectures) and private organisations (also with their own architectures).

Due to the involvement of different service providers the development of the portal has to deal with a lack of standardisation among various service partners. Technologies like Web Services can solve technical problems of interoperability, but terminology used by service providers and service consumers is often incompatible. This increases the chance of errors in the service provisioning process. In addition, incompatibility may result in inefficiencies at the side of the service provider. The challenge of overcoming incompatibilities gets bigger as more different organisations are involved in the network of service providers.

Coping with legacy systems is another interoperability challenge. As the number of partners grows, so does the number of legacy systems involved in the cross-agency process. Standardised interfaces can help in making legacy systems accessible, but this doesn't solve the fact legacy systems are involved.

The ability of a system to adapt to the number of partners involved, the volume of data and transactions, etc. is referred to as scalability (Medjahed, Benatallah, Bouguettaya, Ngu, & Elmagarmid, 2003). The demand driven architecture is very high-level and has only been specified to a few cases. The architecture deals with a number of partners in a complex service networks. Scaling the architecture to include more services or a wider variety of service providers increases this complexity even more. Service oriented architectures are better at this than 'traditional' architectures are, but scalability remains a challenge nonetheless.

Furthermore, many organisations have implemented a multi-channel strategy, or are considering implementing one (Pieterson, 2009). Channels like the website, the telephone and a counter desk require synchronisation of information across channels. For service networks, this means that not only various organisations need to be taken into account, but also the various channels at the organisations. Orchestrating across channels is a challenge that adds to the complexity.

Roles and responsibilities need to be clearly allocated to partners in the service networks. In the case, the overall responsibility was assigned to the municipality, in this case the City of The Hague, as is required by law. The City of The Hague is innovative and already uses Web service technology to allow for communication with partners. Combining these technological standards with Service Level Agreements (SLAs) should result in an architecture with standard sockets for partners to plug-in (or out).

The existing information systems and data at individual organisations, the shared systems and data, the architectures that organisations use to align these IT elements with the business internally and/or external, an overarching architecture, and the governance of these architectures are all elements that result in interdependencies in a public-private service networks. Therefore, they all contribute to the coordination challenge.

4.3 Coordination challenges in a public-private service network

In the case description and analysis, we have found a variety of elements of public-private service networks that are interdependent. The coordination challenge is dealing with those interdependencies that need to be dealt with in order to realise concerted action, i.e. to realise integrated service delivery by a network of public and private actors. The coordination challenge in the public-private service networks in this case is determined by two factors. The first is the extent to which services are integrated, thus the degree to which the coordination burden befalls on the service providers. The second factor is the type of cross-organisational service delivery process. For predictable and sequential service delivery processes, the coordination challenge is primarily on the interdependencies between the steps in the process flow. For less predictable and more reciprocal process flows, the coordination challenge is in the interfaces between the various actors in the service network, as these interfaces have to be able to accommodate a wide variety in the (sequence of the) interactions between the actors.

In this section, we discuss the interdependencies and the coordination challenges that they pose based on the case description and analysis in the previous section. At a high level of abstraction, we can use the three layers of high-level elements of public-private service networks:

- The actors in the network (i.e. the organisations and departments);
- The steps or activities in the service delivery process that these actors execute;
- The information systems and data that are used in the service delivery process.

The interdependencies found in the service networks that were part of this study can be related to these main interdependent elements of public-private service networks. The (more detailed) interdependencies are discussed in this section, alongside the coordination challenge they pose. Some examples that illustrate coordination challenges are discussed here, without also being discussed in § 4.2, to avoid unnecessary duplication of information.

Note that the boundaries between the elements are conceptual and may not always be clear in practice. As the demand-driven portal is a feasibility and development study, not all dependencies play a role in every service network. Furthermore, as the partners that would be involved in a realisation of the portal also collaborated in the portal, the portal itself has characteristics of an organisation of sorts, a bit similar to the idea of a virtual agency (Fountain, 2001a).

4.3.1 Interdependencies at the organisational level

From the analysis of the organisational setting in this study we learn that the design of a portal through which public-private service networks deliver integrated services has to respect the autonomy of the organisations involved. Furthermore, the service needs to be realised; collaboration in the network is not permissive, which might conflict with the need to respect the autonomy of the actors. This potential conflict is also found in the need flexibility, a result of the idea that multiple providers of the same (type of) services should be able to join the portal in order to deliver their services through it.

Whereas a service network involves multiple organisations, it also involves specific departments within those organisations. Friction might occur between the structure and management of the overarching organisation and the structure and efforts of the network, as the dependencies *within* are met the organisational level, whereas the dependencies *between* organisations are at another (e.g. department) level. Given the structural and executive character, the functionality of service networks infringes the organisations more than mere collaboration between the organisations would do. The coordination therefore includes, but also goes beyond, governance, agreements and project management approaches.

These issues lead us to find the coordination challenges discussed next.

4.3.1.1 Goals, interests and stakeholders

The goals and interests of the organisations involved in the portal may be conflicting, even when the planning and enactment of the portal itself is a result of a common goal or shared interest, or when the portal fulfils different goals of the organisations that collaborate in the portal. Some government organisations join to realise public value, for example in the form of high quality service delivery, whereas others do so because

(changes in) laws and regulations steer them towards it. These goals can also be conflicting; in the social support scenario, changes in law made the municipalities responsible for this form of social support, whereas the SVB joins to realise additional public value for the service consumers, and the centre for establishing entitlement to care sees its role threatened by the fact that municipalities may now provide their own entitlement assessment.

Furthermore, the organisations in public-private service networks come from different sectors and therefore have different types of stakeholders that may provide conflicting directions for the collaboration. An example from the social support scenario is that it could be in the interests of individual private service providers that the total number of service providers is limited. However, offering choice to service consumers is one of the public values that the government actors aim to realise with the portal.

Furthermore, in § 4.2.1, we have highlighted the risk that public values might not be warranted and depend on the quality of a private organisation. Agreements about service levels, the monitoring of quality, allocation of responsibilities, and ways of dealing with potential issues have to be made in order to guarantee public value. In the project, government organisations raised concern over sharing privacy sensitive information with private partners. Citizens expect government agencies to handle their confidential information with care, which is also regulated by law. This impacts what information can be shared with partners and the agreements made for this end. In the study, putting the citizen in charge of personal information in the portal, and thereby putting the ultimate responsibility of sharing certain information in the hands of the citizen, solved this issue. Not willing to share information with private parties results in more work for the service consumer, as integration is harder when shared information is limited.

4.3.1.2 Autonomy and position of actors

Public-private service networks include private organisations that are not subject to (public sector) hierarchy and are thus autonomous actors within the network. Furthermore, public organisations can also have a large degree of autonomy. In The Netherlands, semi-autonomous agencies called ZBOs (abbreviation of the Dutch term ‘zelfstandig bestuursorgaan’) are not under direct control of a ministry (an alternative English translation of ZBO that is also used is Self-Administering State Body). A ZBO is a legal entity under public law that performs its tasks as an independent organisation. In the case study, UWV and SVB are ZBOs. Finally, given a silo structure, actors within organisations can also have some degree of autonomy. A public-private service networks thus involves dealing with multiple actors that are – in varying degrees – autonomous.

4.3.1.3 Existing internal and external governance and coordination

As a public-private service network consists of organisations that already exist, there is a status quo of governance and coordination arrangements in the organisations; there is no green field. The existing arrangements can be divided in two parts:

- The existing mechanisms and governance structure for coordinating the interdependencies *within* the organisations:
    - Organisations coordinate the structure of functional siloes and the fragmented way of working within the organisation, in which multiple departments each have certain autonomy with respect to e.g. their way of working;
    - Organisations often focus on the coordination or integration within the organisation, for example by using (enterprise) architecture to align or integrate business processes, information and technology within an organisation.
- The existing mechanisms and governance structure that deals with the interdependencies an organisation has with other actors (coordinating *between* the organisation and other actors):
    - Many departments within the organisation deal with other actors. For example, municipalities have many departments that are sometimes working on very different topics and have less to do with each other than with actors outside the organisation.

The study indicates that an authoritative approach to coordinate the organisation internally may at some point conflict with the coordination of cross-organisational interdependencies. The arrangements that public organisations employ for their interactions with other government organisations are based on hierarchical coordination. The environment of organisations in the private sector is more or less market oriented (as opposed to hierarchy). Therefore, private organisations have different mechanisms for managing their interdependencies with other organisations (such as suppliers) than public organisations have.

The coordination *within* can be quite the same in organisations in both sectors, but the existing coordination *between* organisations is different. In the case this difference is found primarily in the way government organisations deal with the allocation of roles and responsibilities and on how decisions are made and enforced. In public-private service networks, this is no longer a part of a hierarchy.

Furthermore, public organisations become dependent on others for the delivery of public services. However, the organisations from outside the public sector cannot be attributed tasks under hierarchy, thus private organisations cannot be forced to collaborate in the network. The autonomy of the ZBOs is different, as they have a legal task, which may be best realised by collaborating in a network. Private organisations

have other goals (e.g. make a profit), which may lead them to pull out of the service network. However, if private organisations decide to not or no longer join the network, the continuity of the service delivery can be in danger.

4.3.1.4 Roles and responsibilities of the actors involved

Within the three forms of organising a network (see § 4.2.1.4), the parties involved in the network have different roles and responsibilities. In the scenarios, the private service providers add functionality to the joint portal by enabling service consumers to select private providers as part of an integrated process. The role of these providers is then different from the role that the providers already play in the existing situation (i.e. without the portal). In the social support scenario, the government does not deliver house help itself; it provides the funds to those entitled to purchase care. Private care providers thus always have a role to play, but that role is to provide care, whereas the role in the demand-driven integrated portal is to add functionality to the portal in order to enable the portal (and thus the network) to realise integrated service delivery. As the role of the private providers is such, they are responsible for a part of the demand-driven service delivery process in the portal and thus have a responsibility towards the network as well instead of only towards specific care consumers.

Similar issues arise for the government organisations as their involvement in the network brings responsibilities towards the (goals of the) network on top of the responsibilities they already have for performing the public task there are assigned. For example, if a government organisation takes or is assigned the overall responsibility for the network, that organisation has the role of network manager, with the responsibilities that go with it. A leadership role in a network can be an effective way for an organisation to achieve its goals. In the case we have seen that high quality service delivery and efficiency were two goals of the portal. In the study, the initiative was taken by the public organisations. A clear assignment of roles and responsibility is part of the coordination challenges in public-private service networks, as this is needed to ensure that every vital part in the network is fulfilled. It is therefore closely related to the cross-organisational process, of which we discuss the coordination challenges next.

4.3.2 Interdependency in a cross-organisational service process

The study shows that, from a service consumer perspective, many services cross the boundaries between organisations and between the public and the private sector. The more service delivery is integrated, the more the decoupling point shifts and the bigger the coordination challenge for the network of organisations. This challenge is most apparent in the cross-organisational service delivery process, as that is where the service is realised. In integrated service delivery, the interdependencies between

the steps in the service delivery processes have to be coordinated by the service providers. Depending on the kind and scale of a service, operational service delivery processes run continuously, sometimes for thousands service consumers at a time.

In such processes, one can analyse collaborative action "in terms of *actors* performing *interdependent activities* to achieve *goals"* (Crowston, 2003, p. 89). Closely linked to these activities are resources that may either create these activities or be required for the activities (managing shared resources is therefore an important coordination process). In this section, we look at cross-organisational processes as a set of activities performed by the actors in a public-private service network. In the case we found five types of activities: the activities that are performed within an organisation, the activities of an organisation that interact with activities of others, the activities of the service consumer, shared activities, and federated activities. Together, the activities of these types make up the activities within a cross-organisational process.

We also found that service processes in public-private networks not always reflect a sequence of steps. Still, a sequential view on processes is often used to define static processes that cross the boundaries between organisations in a service delivery chain. The complexity of public-private service delivery can also take the form of reciprocal processes in which many variations in the process flow are possible. The flow of such processes is less predictable than the flow of sequential processes and requires more flexibility.

4.3.2.1 Activities within organisations and activities between actors

Any action by an organisation – public or private – is based on activities, whether by politicians, policy makers, public servants, executive organisations, departments, systems, etc. An activity can be everything an actor does, but in the study this is limited to the activities that contribute to the overall goal of providing a service. For the social support scenario the activities of the service providers include assessing a person's entitlement to care, setting up a contract, awarding a contract, paying the financial support, administering the care budget someone has been given, etc. An organisation may perform multiple activities that together form a part in service delivery. For example, in the work re-integration scenario, when someone wants to register as being unemployed at the agency, the agency (UWV) performs only a part of the integrated service, but that part involves many activities such as collecting address information from the municipality, collecting income information from the Tax and Customs Administration, assessing documentation of the past and potential future income of the service consumer, creating a profile, calculating social security benefits, setup a plan to reintegrate the service consumer in the job market, etc.

In a cross-organisational service delivery process, many of these activities interact with activities performed by other organisations. For example, the activity of

collecting address information from municipality interacts with activities at the municipality, in this case the registration, documentation and provision of address information.

The interdependencies between the activities of multiple organisations are – for sequential processes – well described by the three basic types of dependencies found in chapter three: the fit, flow and sharing dependencies. In the social support scenario, the cross-organisational process consists of flow dependencies for almost every step. Flow dependencies are endemic to sequential processes, where one activity precedes the next. First, a service consumer has to apply for social support, then an organisation can check whether the application is filled-in correctly, then an organisation can assess the entitlement to social support of applicant, etc. These activities also have sharing dependencies, for example because there is a limited budget for social support, and fit dependencies, as the integrated service (i.e. house help care) requires activities of all the organisations involved in the network. Managing these dependencies is the coordination challenge for sequential processes.

In reciprocal processes, however, the interactions between the activities are more complex and less predictable. Sharing and fit dependencies are common, in which multiple activities either use the same resource of collectively produce one. Furthermore, simultaneity constraints occur when activities need to – or cannot – occur at the same time (Malone & Crowston, 1994). As this type of dependency has to do with the ordering of activities, it is related to the flow dependency type, but more specific. Task-subtask dependencies relates to the decomposition of a goal into activities that achieve sub goals, which together will achieve the overall goal (Malone & Crowston, 1994). Since the outcomes of the various activities have to contribute to the overall service delivery, this dependency type is a form of a fit dependency. However, the various activities aim to achieve sub goals, which could be part of a flow, which in turn could be part of another flow and then has fit dependencies on multiple (sequential or parallel) flows. Therefore, in reciprocal processes, we expect the flow type of dependencies to often co-occur with fit dependencies. The challenge is in that coordination cannot focus on the flow dependencies between activities, as the flow is unpredictable and may vary for individual service consumers. This is the case in the work re-integration scenario, in which – in contrast to the social support scenario's 'workflow' approach – the process flow bears more resemblance to a plate of spaghetti than to a straight line, as visually illustrated in **Figure 6** (note that this figure is an illustration of a nested structure of activities, not the representation of a process in the case). The organisations involved work for the same client sequentially or in parallel, while sometimes interacting with other organisations, for example because they need a resource produced by an activity of another organisation, because they provide a resource that others use, or because the activity has to achieve

a goal in collaboration with other activities. Especially the technical facilitation of such a nested structure of activities is difficult. We address that in chapter seven.

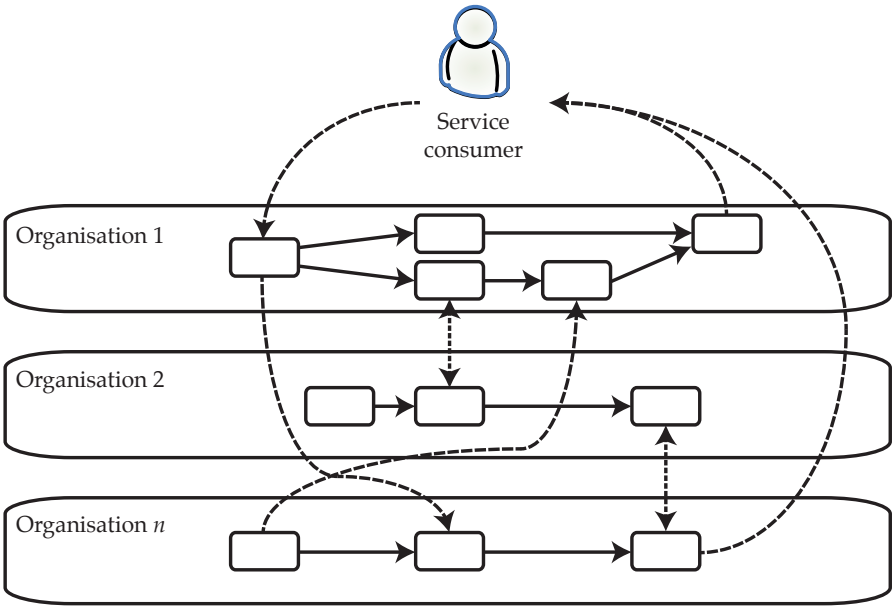

Figure 6: **visualisation of a nested structure of activities**

4.3.2.2 Activities of the service consumer

The set of activities that the service consumer has to perform depends on the extent of service integration by the joint service providers. In many service delivery processes, the service consumer still has to perform quite a number of activities, such as collecting official documents and proofs from various organisations. In integrated service delivery, the service consumer has the least possible activities. However, there will always be some activities that the service consumer has to perform, as the service request links the daily business of the service consumer with the daily business of the service providers. In the portal, the service consumer has – with respect to the service delivery process – at least one activity to perform; the invocation of the service. For both scenarios, the starting point is a service request based on a change of status of the service consumer. If the network of service providers performs more coordination, fewer activities need to be performed by the service consumer. Some services may be initiated for another reason, such as a time trigger (in case of annual taxation), but may also require activities from the service consumer, even if it is only limited to reviewing and agreeing a form. Ultimately, it is the responsibility of the service consumer that all information is correct.

4.3.2.3 Shared and federated activities

Parts of the functionality of the portal involve activities that affect multiple organisations. This is the functionality that the portal provides in addition to the individual activities of the service providers. The architecture describes three (application) functions of the portal (providing four services) that are part of the shared infrastructure of the portal (discussed in: Lankhorst & Derks, 2007):

- Authenticating the user of the portal;
- Authorisation of the user of the portal, and;
- Finding services and information.

The latter requires a directory of available services or service components that the service consumer can use. The other two – authentication and authorisation – proved to be a bigger coordination challenge in this study. The two are related as the authorisation service of the portal is intended to be used by others than the service consumer. For example, in the social support scenario a general practitioner can be authorised to act on the behalf of a patient in requesting social support after a medical event. Related to this is the authentication of the user, which is important for all kinds of service delivery but is more difficult in electronic service delivery as face authentication (i.e. physical presence and authentication with a passport) is not possible.

Authentication involves a number of activities that are either shared between the service providers or are activities of individual service providers that are used by others; federated activities. An important element of integrated service delivery is a single sign-on service to authenticate a service consumer only once for the entire cross-organisational process. In the case we found that the organisations prefer a global (i.e. shared) authentication service to federated authentication. Without sharing the authentication activity, the organisations have to rely on the authentication of a user by other actors, or each use their own authentication service. In the latter case, single-sign on is not possible. Without shared authentication, the organisations in the network have to trust the authentication process of the organisation that operates the portal or that is first in chain in a cross-organisational service delivery process. However, such an authentication may not provide sufficient security or information. Furthermore, § 4.2.1.5 illustrates that a lack of trust in each other's authentication facility, combined with the fact that the government's global authentication service may not be used by private organisations, makes the realisation of single sign-on very difficult.

Furthermore, as many government agencies in The Netherlands have adopted DigiD, the facilitation of shared and federated activities in the collaboration with other government organisations is easier than in the collaboration with private organisations. The existing building blocks of e-government in The Netherlands thus

bring an additional challenge for public-private collaboration. Finally, a concern for shared activities is the availability and questions of responsibility and accountability. For federated facilities, the limitations include – besides a lack of trust – limitations in the mechanisms used and the interoperability between the activities.

4.3.3 Interdependent information systems and data

Most activities of organisations are performed or supported by information systems and rely heavily on data. Information systems provide a wide variety of functionality, for example processing requests and changes in data. Furthermore, data presents a coordination challenge by itself.

In the description of the use of ICT (§ 4.2.3), we found that to dynamically integrate services, organisations look for modular approaches such as a service oriented architecture. Organisations have to interconnect the different (stove-piped) departments and systems that exist within their organisations as well as the organisations themselves. Furthermore, the actor composition of networks may not be static and change over time. This requires the architecture of the cross-organisation service delivery platform (i.e. the portal, in this case) to be flexible and adaptive to changing configurations of (private) service providers that 'plug' in or out of the network.

4.3.3.1 Fragmented and legacy information systems

The main coordination challenge in information systems has been discussed in both the background and the case description; the variety of functional siloes, information systems, and dispersed data pose complex interdependencies in cross-organisational service delivery. Many organisations – both public and private – have put effort in overcoming this fragmentation of information and information systems within the organisations. For this, a variety of approaches are used, ranging from a complete redesign of the business processes and information systems to the creation of interfaces between existing (legacy) systems. Many of the organisations in the study have adopted the latter approach. The result is that there still exist a large number of legacy systems that have to be interconnected somehow. One organisation in fact provides two computer displays, each displaying one system; interoperability is thus partly assigned to the users of the systems. As a result of the legacy system, internet transactions are not always processed in real-time.

The variety of systems used by the organisations in the network, including legacy systems and systems using different standards, is a major interoperability challenge. The portal is therefore based on a service-oriented architecture approach. In a SOA, the functionality of (legacy) systems is opened up through the use of web services. The challenge of coordinating different information systems is handled by business process orchestration or choreography. Often, the focus is on providing a detailed

description of business processes and on defining interfaces of information systems that often contain many information elements and are consequently 'thick'. Streamlining these interfaces requires a standardisation of the processes involved, because otherwise thousands of processes need to be analysed and (pre-) defined to enable cross-organisational service delivery, which is not feasible.

4.3.3.2 Technical facilitation of cross-organisational processes

Business process orchestration is based on interactions between web services (and thus information systems) in a request-response style. This means that one piece of functionality (i.e. a web service) requests processing or information of another piece of functionality, which provides a response (e.g. a result). This can either by synchronous or asynchronous. The services that networks deliver are often realised by inter-organisational business processes, which combine process steps executed by each of the partners. This allows for the decoupling of services from the organisational structure and technical implementation. The overall service delivery is composed of web services that are invoked in a certain order. This way, coordination is done at the process level by coordinating the various parts different that organisations contribute to the service delivery. However, the type of interactions in reciprocal processes resemble what He, Haas and Orchard (2004) call a "conversational message exchange" (3.13). Furthermore, solutions like choreography and orchestration do not fully support interactions by multiple parties and are often described from the perspective of one actor (Barros, et al., 2005; van der Aalst, et al., 2005).

A service delivery process flow cannot always be specified in advance, as they do not necessarily follow a predefined, linear path. As a consequence, coordinating the activities of the network of organisations is difficult. Networks of service partners require flexible mechanisms able to deal with new types of requests. As such, the challenge for the coordination of the interdependencies between the information systems in the network is that it requires well-defined interfaces and interoperability between a wide variety of heterogeneous information systems, but at the same time, defining the interfaces and developing interoperability between systems is a huge challenge if the line of action that service delivery processes in the network take is difficult to predict, and thus to specify a priori.

4.3.3.3 Coordination challenges related to data

In the study, various types of data have been identified that are relevant to the portal: personal data, case data, service data, and object data (Derks & Lankhorst, 2006). The aim of the portal is to put citizens in charge of their personal data as much as possible. However, there are a number of issues regarding the data used in the portal. In the

study, the following general challenges for data were identified (Derks & Lankhorst, 2006):

- Distribution: centralised and decentralised changes in data, automated changes and creation of data, relationships between and redundancy in data, inconsistency, and repeated data provisioning;
- Compatibility: data composition and selection, semantic standardisation, establishing what data represents, situation specific interpretation (deviation from standards);
- Quality: history of (usage of) data, certification of data (establishing quality);
- Access: who uses, has to use or may use data, and when, where, and what for.

The manifestation of these challenges is best described by discussing the four data types relevant for the portal.

Personal information of the service consumer

The portal uses a user profile that consists of information about the service consumer. The service consumer can select which personal information may be retrieved from the various service providers. This relies on clear authentication; when the service consumer is signed in, the portal knows the citizen registration number (in Dutch: Burger Service Nummer, or BSN) and can use this to request e.g. address data from the municipality and income data from the Tax and Customs Administration. The data about a service consumer – even when limiting it to the data pertaining to a specific service – is fragmented over the information systems at the organisations involved in the network and used by various (parts of) services and processes. In other words, the data is distributed throughout the network. One important design choice is on who can use and change the data; the data is administered by one organisation in the network and any changes in that data through the portal should be fed back to the organisation that keeps the original data. However, for certain data, other organisations have registries as well. For example, in The Netherlands, citizen address data is kept in the GBA (civil registration). Private organisations may have a similar registration of their own, for their own clients or customers. Furthermore, the registrations of other actors in the network may not hold sufficient information for all organisations. Finally, the same kind of data, with the same name (e.g. income), may have different meanings for different organisations or in different situations, i.e. semantic ambiguity.

The case file

The information on service requests of service consumers forms a case file, based on personal information. Besides this personal data, a case file consists of some additional data. This data is primarily related to the processing of the various components and steps that the cross-organisational service delivery process is made

of. Information about the status, handling and intermediate outcomes is part of the case data. As was the case in the previous type of information, ownership and access rights of this data is an important element. The idea behind the demand-driven portal was that service consumers and service providers collaboratively work on a case file. The case file thus contains shared data, which brings challenges on topics such as access priorities and semantics. Furthermore, the quality of the case file is very important as it builds a history for a specific case and contributes to the history of a service consumer. An accurate registry of the history is also important for accountability purposes, e.g. to establish whether something has gone wrong and who is responsible.

Service data and object data

Service and object data are described together as they are relatively straightforward and share similar issues. Service data describe a service. This is important for two reasons: first it enables the identification and selection of service that are needed or applicable for a specific person and case. Second, it allows the organisation of the wide variety of services that are somehow related. There are several organising principles. In the study, two such principles were used: life events and a specific policy terrain. An example of a life event is becoming unemployed. Based on this life event, the organisations involved in the work reintegration scenario can be dynamically selected as the service providers for the service consumer with that life event. Note that any principle for grouping services means that service delivery is not entirely demand-driven, as it is some kind of pre-structuring of the service delivery, although it is more demand-oriented that the traditional way of organising it based on policy areas. Finally, object data is data that describes objects in the physical reality, such as cadastral information on buildings or information on vehicles. For both service and object data, the quality of the description and semantics are the dominant issues and challenges for coordinating the interdependencies between the data.

4.4 Findings: coordination challenges in public-private services

In this chapter, we have described a study on an electronic portal that provides demand-driven and integrated services of public and private providers to citizens. This was part of a research and technical development (RTD) project aimed to study the feasibility and development of such a portal, including the user requirements, and prototyping. As a result, the project gave us access to key players in Dutch government that are thinking about or working on the improvement of public service delivery through electronic portals in which private parties play a role as well. By studying the interdependent elements that have arisen during the RTD project and the coordination challenges that practitioners identify or encounter, we now have a first understanding of the coordination challenges that those interdependencies pose. Before we move to conclusions about this study, we summarise the coordination

challenges found in this study in **Table 1**. We use the three layers from chapter one as high-level elements of interdependence in public-private service networks and find that these provided us with sufficient structure to identify and describe interdependence in these networks. The way that the interdependencies pose coordination challenges is discussed in § 4.3.

Table 1: **Summary of coordination challenges per level of interdependence**

High-level interdependent elements	*Coordination challenges*
Organisations	Goals, interests and values of actors and stakeholders Autonomy and position of actors Existing organisational structure and coordination *within* Existing cross-agency collaboration and coordination *between* Roles and responsibilities
Cross-agency process	Orchestrating activities of organisations Reducing activities of the service consumer Shared and federated activities
Information systems and data	Interoperability of fragmented information systems Legacy information systems Multiple types of data Distribution, compatibility, quality and access of data

The nature of this study (explorative study of the development of a portal) cannot warrant that all coordination challenges have come up. However, by relating the issues and coordination challenges that did come up to the theoretical background of public-private service networks and the lens of coordination theory, some findings can be identified in this first empirical phase of the research.

It is important to note that the burden of coordinating the interdependencies between the activities of the service providers was there all along. However, often the service consumer was burdened with the task of coordinating these various activities. In integrated service delivery, the service providers take over this orchestration task from the service consumer and thus have to coordinate the interdependencies

amongst themselves. Integrating service delivery thus shifts the coordination load from the service consumer to the service providers. Furthermore, this shift expands the coordination challenge, as in a fragmented (i.e. not integrated) situation, the service consumers request the various services that are part of a broader service process and functions as the linking pin between the various components of the service, and thus as the linking pin between the service providers involved. There were thus just as many orchestrators as there were service delivery processes. As the service consumer was responsible for managing the dependencies (e.g. that the right information gets from provider A to provider B in time), a limited view on coordination as managing the dependencies between activities was sufficient. However, when the network of service providers is responsible for the coordination task, they have to coordinate in such a way that concerted action can be realised for all service consumers. With the exception of a situation in which there is a case manager for every individual service consumer, coordinating each individual service delivery process is not possible, especially not when these processes are supported by ICT. In such a situation, the interdependence between the activities is expanded with interdependencies between the organisations that perform these activities, with interdependencies between the information systems that facilitate the organisations in executing their part of the service delivery process, and with interdependencies between data at the various actors involved in the network.

In literature on coordination, we found that it either provides high-level forms of coordination, or focused, but narrow views on the coordination of one specific element, for example on activities. In this case study, it becomes clear that the coordination challenge in a public-private service network is more complex and that the coordination of such networks indeed requires a better understanding of what should be coordinated, and how, in order to realise public-private service delivery as envisaged in the portal. From this perspective, we learn something on both of the views on coordination.

4.4.1 Findings for high-level views on coordination

From the case description and the coordination challenges that we discussed above it becomes clear that integrated services involve networks of service providers. Within these networks, there are many interactions among and between departments and organisations. However, the public sector is more hierarchical than the private sector when it comes to the inter-organisational coordination. We also see that in the case; both the social support and the work re-integration scenarios include public organisations that perform a function in the scenario defined by law or regulations (e.g. for semi-autonomous executive agencies) or because an actor is subordinate to the authority of another organisation (e.g. a ministry). This creates a relatively stable and predictable environment (relatively, because in some more turbulent areas of

government functions, the environment may be less stable, for example due to frequent changes in law).

Even in the collaborative setting of the portal development, the relationships between the public and the private partners are not entirely on a peer level, as government organisations take the lead. The relationship between the two sectors resembles a principal-agent relationship. In this way, the government agencies retain some control over private sector involvement. However, the basic modes of coordination found in theory – hierarchies, networks and markets – are all found in the public-private service network, and may clash.

Hierarchy is found primarily within organisations. This is relevant as the organisation is not always involved in its entirety, but individual departments are part of different networks. This is primarily found in municipalities, where for example the department dealing with social support participates in the network and thus collaborates with the other actors mentioned in § 4.2.1.1. The municipality, of course, consists of many more departments, that each performs different (sometimes interrelated) tasks. As these tasks are performed for different networks, the departments each collaborate with different organisations. The effort that the municipal organisation puts in coordinating the interdependencies within the organisation, for example to provide an integrated front office, may facilitate the integration within the municipality, but hinder the integration of the operations of specific departments with the activities of other organisations in the networks they are in. Thus, whereas hierarchical coordination *within* an organisation deals with the interdependencies *within* the organisation, this may be conflicting with the various dependencies that parts of the organisation have with other actors in the domain (e.g. social support) that the part is operating in. Thus, the coordination *within* an organisation may frustrate the coordination *between* organisations. This is also visible at a higher level; even though some government organisations involved have a large degree of autonomy, the use of national e-government infrastructure building blocks can be prescribed. However, for actors within government that work closely with private organisations, such building blocks hinder the collaboration with private organisations for service delivery as the building blocks are limited to the public domain.

Thus, even though the organisations collaborate in a network structure, in which also the government partners have some degree of autonomy, the hierarchical approach in the public sector entails that network or market forms of coordination are not realistic in these networks. However, given the autonomy of the actors, especially those in the private sector, hierarchical coordination of the network is not possible either. Nor is a market approach feasible, as even in the situation in which private parties compete for their role in the service delivery, the government actors must

warrant public values and the continuity of the service delivery. Therefore, the network requires the flexibility to deal with forms of coordination in hierarchies and in markets, as the organisations in a public-private service network bring in both forms.

Finally, the coordination challenges illustrate that the high-level mechanisms of network are related to operational elements. A key example from the study is the authentication infrastructure. Even though trust is indeed an important mechanism between the organisations involved, the trust that is sufficient to develop a joint portal did not resolve the lack of trust in the authentications and authorisations of each other during process execution, resulting in a situation in which a shared activity is now a federated activity. Another key example is mutual adjustment, which does not just typify the relationships between the process steps at the actors, but has severe implications for the information systems as well, which we will extensively discuss in chapter seven.

4.4.2 Findings for the process view on coordination

The service network is not just an assembly of organisations; the organisations have to jointly execute an integrated service delivery process. The dependencies between the various components in the service delivery process have to be coordinated in order to realise such cross-organisational service delivery. This is consistent with coordination theory that focuses on coordination as dealing with the dependencies among activities and resources. Depending on the level of abstraction, the parts that individual service providers contribute to the overall process can be considered an activity, or these parts could themselves be considered processes that consist of multiple activities.

This process-oriented coordination lens thus aims to provide solutions for the interdependencies in the (cross-organisational) process flow. However, when comparing this view on coordination with the challenges identified in this chapter it fails to deal with three issues. First of all, we identified a number of coordination challenges that have to do with the organisational setting of multiple, autonomous actors. These actors may have different and potentially conflicting goals and interests. Furthermore and perhaps even more important, any coordination mechanisms that deals with dependencies in the process flow also has to respect the organisational setting, such as autonomy of the actors involved. The process of selecting mechanisms to deal with process dependencies has to deal with interdependence between the actors that have to agree on those same mechanisms. In short, coordinating the process alone fails to respect the socio-organisational and multi-actor interdependencies.

Second, a cross-organisational process flow is facilitated by a complex landscape of information systems, which might not be interoperable. Dealing with fragmented and legacy systems present another coordination challenge. Furthermore, data has specific characteristics that also pose a coordination challenge, apart from how it is used in a process.

Third, even for the interdependencies in the cross-organisational process, there are different types of processes. When looking at the two scenarios in the case, there is a large difference between the two. The interdependencies in the social support scenario have a sequential form, whereas the work re-integration scenario has a less predictable process flow. This difference has an impact on the coordination mechanisms that can be applied in the portal. March and Simon (1958) noted that stable situations can primarily rely on coordination by plan, while less predictable flows rely more on coordination by mutual adjustment (which is the term Thompson (1967) uses, March and Simon originally used the term 'feedback'). The observation by March and Simon has implications for the coordination mechanism that can be used to coordinate the interdependence that comes with a portal such as described in this chapter, as mutual adjustment relies more heavily on decisions and communication activities between actors, whereas standardisation and coordination by plan deal with the coordination challenge on the level of processes.

Furthermore, in the work re-integration scenario, it proved harder to select a coordination mechanism for the portal. In this scenario, service delivery processes at the various providers are interwoven, making it difficult to predetermine what the precise service component is that each party delivers and how these components can be modularised to use in a demand-driven portal for various contexts. To provide an example from the scenario; the re-integration bureau performs a number of activities on behalf of UWV. The re-integration bureau thus provides the service, while the UWV is responsible. This relationship can in itself also be regarded as a service relationship: towards the service consumer, UWV is responsible for the overall service (including coaching and searching for job vacancies), but the re-integration bureau is in turn responsible – towards UWV – for delivering parts of this service, such as matching with job vacancies, selecting additional courses, etc. In this, the account manager at UWV is responsible for the coordination of the process.

This nested structure of service delivery, responsibilities and performing activities on behalf of the overall process complicates the coordination of the service delivery by this network. The internal structure of the network cannot always be hidden from the service consumer; a third party provider may need to contact a service consumer directly, but for the service consumer the original service provider (i.e. UWV) is the point of contact and is held overall responsible. Due to this structure, the interactions are less automatable than in the social support scenario, with its more sequential

form. For the work re-integration scenario, the lower predictability leads to coordination by mutual adjustment, which requires more information sharing between the actors. The interactions between the actors are thus very information-laden. The coordination between the elements in the line of action is focused on the interfaces between the parts, whereas in sequential processes, the coordination is focused more on the overall process, as that is more predictable and thus easier to define in advance.

4.5 Conclusions

When a network of organisations aims to offer integrated or joined-up service delivery, they have to coordinate the interdependencies that arise in their joint efforts. Following the definition we used in chapter three, coordination is aligning the elements in a system in such a way that concerted action can be realised. In this case, the public-private service network is a system that collaboratively provides services to service consumers. As services are integrated or joined-up, the task of coordinating the elements in the system befalls on the actors in the network. It is necessary to identify which elements in a public-private service network are interdependent and which of those elements have to be coordinated in order to realise integrated service delivery. The theoretical proposition we put forward based on the literature we consulted was that literature provides either high-level elements (e.g. organisations) or specific elements on a single level (e.g. activities and resources). These views are too limited to identify all interdependent elements that require coordination in order to realise service delivery in such a network. Therefore, we explored the elements in a public-private service network in the explorative study and summarised the elements in **Table 1**, which is the core of the answer to research question one. In our exploration of these elements, we found challenges in the coordination needed to deal with these interdependent elements for realising service delivery; the coordination challenges, which answers research question two. A consequence of taking too narrow a view on interdependence is that the complexity of the interdependencies is insufficiently understood and coordination challenges could be missed or neglected.

The coordination challenge identified in this chapter requires more detailed coordination than high level forms – such as command, trust and price – provide. Furthermore, it shows that the coordination challenge is broader and more complex than is provided for in coordination theory focusing on the interdependencies between activities in the process. As such, the study confirms our theoretical proposition, which was that current views on coordination do not sufficiently address the complexity of the coordination challenge in public-private service networks, as they are either too high-level, or too narrow. If coordination challenges are missed because the focus was on a specific subset of challenges only (e.g. process or technical), the coordination fails to deal with these challenges and thus does not cover

all the interdependence in the network. We used a multi-layer perspective on interdependent elements and found various coordination challenges for all layers. We have looked at the public-private service networks in the scenarios through a coordination lens, looking for interdependence. The multi-layer approach deals with interdependencies between actors, steps in a process, systems, or other interdependent elements. As such, it enables us to see coordination challenges where a narrow view would have misrepresented the coordination challenge to a single level and focused the coordination mechanism on that level, thus underestimating the complexity in public-private service networks. Our search for coordination challenges at the level of the network of organisations, at the level of the cross-organisational processes, and at the level of data and information systems yielded a number of notable challenges that are important to take into account when coordinating public-private service networks.

This explorative study also suggests that the coordination challenges are interwoven. For example, the potential conflict between the coordination within an organisation and the coordination between organisations is also related to the interoperability of information systems, as a system may form a fragment from the organisation's point of view, but works well in collaboration with partners in the network. Another example is the issue with single sign-on; a sub-optimal technical mechanism was selected due to a trust issue at the organisational level.

For each of the three levels we set out with in chapter one, we identified multiple interdependent elements. At the level of organisations, the complex organisational setting features multiple organisations, from different backgrounds, with different goals, varying degrees of autonomy and existing coordination mechanisms that add to the coordination challenge. At the level of the cross-organisational process, we found that such a process is not just a sequence of activities, but that there are multiple types of activities that require different means of coordination. Furthermore, such processes are not necessarily sequential, but can also be reciprocal in character.

Also, the efforts to coordinate the dependencies within organisations may increase the difficulty of dealing with the dependencies between departments within the organisation and its network partners. There is no green field; organisations themselves are often fragmented. In public-private service networks, the basic types of coordination (hierarchy, market and network) meet. As a result, the parties in the network may have different types or approaches to coordinating dependencies within and between actors (see § 4.4.1). Furthermore, the composition of the network is not static and may change over time. This challenge also extends to the technical level, as the technical facilitation has to be able to facilitate changing configurations of the network. This requires the interfaces between actors to be flexible, for example by the use of events.

Pertaining to the use of ICT, we found that data has challenges of its own, which – for the sake of clarity – we discuss data together with information systems as part of the ICT level. These include the distribution of data, the compatibility of data, the quality of data and access to data. The first is related to the fragmentation of organisations and systems, the second relates to the major challenge of dealing with semantic ambiguities and a lack of standardisation, the third and the fourth have much to do with organisational challenges, such as trust and responsibilities. This will become clearer in the next chapter, as in the RDW case the quality of the data in the basic registry partially depended on the efforts of private organisations. Consequently, the coordination mechanisms employed to realise this are not just aimed at the technical interdependencies but also related with the organisational interdependencies.

In this explorative case study, we found coordination challenges consisting of interdependencies between multiple elements in the network. The next question is how public-private service networks coordinate these interdependencies. Therefore, the next chapter deals with the coordination of such networks. For this, we keep the main structure of the three levels. We also search for the coordination challenges we identified within these generic levels, but as this is only one case study and there is no guarantee that we captured every potential challenge, we keep an open eye for other coordination challenges. Also, not every challenge may come up in every situation, as we study this phenomenon in its real-life context and the contexts may differ.

5 Coordinating a public-private service network in practice

"Saying 'I will coordinate' will only lead to resistance"

- director of a Dutch government agency –

In the inventory of coordination challenges in a public-private service network, discussed in the previous chapter, we found that coordination theory does not cover the wide range of coordination challenges found in the first explorative case study. We identified interdependencies creating a coordination challenge at the level of organisations, between the steps in a cross-organisational process, and between information systems and data. These interdependencies pose coordination challenges that need to be dealt with to realise integrated service delivery as discussed in the previous chapter. In this chapter we describe our study on how a public-private service network coordinates this broad range of interdependencies in practice. This chapter covers the second phase of our empirical research, in order to answer RQ3: *how is a public-private service network coordinated in practice*?

To answer this research question, we employ two methods. First, we describe the findings from a series of interviews with practitioners and experts from various organisations. The interviews were semi-structured (the protocol is included in appendix A) and focused on identifying the main coordination strategies employed in the organisations or organisational networks that the interviewees work in and/or have in-depth knowledge of. By strategies we mean a generic approach to the coordination challenges, instead of a comprehensive set of methods and tools to deal with them, which we refer to as coordination mechanisms. Again, we structure this description by means of the three layers we started with in chapter one: the organisational setting, the cross-agency service delivery tasks and processes, and the use of ICT.

These layers are used to structure our discussion of what actors identify as being done to deal with interdependence at those layers. Diversification of coordination strategies remains possible within and between these three layers. Still, much complexity exists within these layers as well and the coordination strategies identified by the interviewees tend to focus on one of the layers only. Therefore, we also look for contradictions between the various coordination strategies that the interviewees identify. This inventory shows that there are contradicting ways of dealing with the coordination challenges. The broad perspective gained by covering the three layers helps to illustrate that in many networks or organisations the core of the coordination is on one level only.

For the second part of this chapter we study a case in which a set of coordination

mechanisms covers the breadth of all three layers. We investigated the case of the Dutch Department of Road Transport (RDW), a ZBO (see § 4.3.1.2 for a brief description of this agency type). This presents a revelatory case, as it is a public-private service network optima forma in which public and private organisations are interdependent for the core operations of the network. Furthermore, when looked at from a broad coordination lens, the coordination in this case includes a comprehensive set of mechanisms for dealing with the full breadth of interdependencies in the network. For this part, a case study strategy is adopted (see chapter two) as it shows how this public-private service network is coordinated. Together with the interview series, the aim is to build a framework in the next chapter (Yin, 2009). Parts of this chapter have been published in papers (Klievink & Janssen, 2008b, 2010a) and a research report (Klievink & Janssen, 2008a).

5.1 An inventory of coordination in practice

For the inventory of coordination strategies we have held interviews with experts and practitioners from government. The interviews were semi-structured and we looked for specific situations of interdependence and the coordination strategies the interviewees identify in practice for dealing with the interdependencies. We therefore do not discuss the situations we encountered as such, but focus on the coordination strategies we found, for what purpose or situation they are employed, and what can be learned when comparing various ways to deal with interdependence.

In total, for this part of the research, we have spoken to 20 people during the second half of 2007 and the first half of 2008, including people from five government agencies in The Netherlands and three government agencies (in total) in Belgium and Canada. We talked to people from Belgium and Canada to gain additional insight in cross-agency coordination in a federal system, whereas The Netherlands is a (decentralised) unitary state. We asked the interviewees to describe the nature of a network their organisation was part of and on which they had expertise. Furthermore, we inquired after their perception of the coordination in their situation and why it is coordinated in such a way. As we acknowledge that the respondents from Belgium and Canada may have a different mind-set that we are used to, we strengthened the results from the interviews from these countries by speaking to four experts able to take a comparative perspective on government service delivery and with knowledge of the various situations. Furthermore, some of the findings were corroborated with document analysis.

5.1.1 The organisational setting

5.1.1.1 Coordination in a politically sensitive environment

Interviewees indicate that a collaborative approach to service delivery represents a major shift in the way that organisations work. The required change in organisational structure, processes, and culture introduces sensitivity or even resistance to change within the organisation. Therefore, getting actors on board of a network approach to service delivery requires more than a good idea and a vision on how it should work.

Most of the interviewees indicated that a person or a small group of people with a pioneering role are necessary. These pioneers need to have the stamina and dexterity to cope with the various forces at play within the organisation and the network of organisations. They have to deal with the current situation and the relative power positions of the actors involved. As we have seen in the theoretical background, this is especially true for organisations in the public sector, that have an organisational structure and a way of working that is quite different to that in networks. Some public organisations are highly politicised or in a politically sensitive domain and this has an impact on the way that the interdependencies in a network can be dealt with. Therefore, the socio-political environment has an effect on the coordination mechanisms that can be used to deal with the coordination challenge that stems from the enactment of service delivery by networks of organisations. The stability may also change over time. One interviewee, an information systems architect, when discussing the role of architecture in the coordination of the technical interdependencies, said that while architecture is used in stable times, "*in politically turbulent times, the architecture is often surpassed*".

The impact of the socio-political environment becomes especially clear in the interviews with people from the federated states in this study; Belgium and Canada. We have spoken with people about a number of organisational networks; for Belgium this focused on an organisation that brokers information in the social security network, and in Canada this was on information one-stop-shops for businesses (Canada Business Service Centres) and citizens (Service Canada). In these situations marked by political and administrative fragmentation, the coordination mechanisms employed are highly influenced by this situation. We found that these coordination mechanisms avoided the political component by focusing on exchanging information and standardising interfaces. In fact, the core of coordination in these networks is on the information and technical level and thus has much to do with the coordination challenges that arise from the interdependencies between data, information systems and business processes. Due to the fragmented political situation, the interdependencies between the actors cannot be dealt with by coordinating the organisations or the political situation, therefore, the choice for focusing the coordination on that level is in fact very political in its avoidance of politics.

The Belgian organisation handles over a billion messages (between the actors in the social security network) each year, for which systems and processes have been completely redesigned in order to not have to infringe upon the autonomy of the organisations involved. If that had been necessary, the network coordination that is in effect now would probably not have worked. A similar situation was encountered in the Canadian situation, in which the relationship between a province (state) and the federal government is not always warm. For Quebec, this is for example due to the linguistic barrier, whereas in other provinces, a different political colour than the federal government may trouble the relationship as well. The Canada Business Service Centres offer a multi-channel one-stop-shop (featuring a *click-call-visit* approach that has been identified as a good practice (e.g. Accenture, 2005)) for federal, state and municipal services provided to people that want to start a business, expand their business, take-over a business, import or export goods, or foreigners that want to do business in Canada. The aim is to make sure that clients have all the information and to give them directions on where they can find which information and services. This is helpful since many services for businesses are fragmented over various government agencies at various levels. While local regions have differences, the system in one place is connected to other agencies that together make up the Canada Business Network. The service is free for clients, and is paid for by the federal government. For government, the service reduces the number of unnecessary contacts, as clients already know where to go and what they need. In addition to that, it also serves as a valuable central source of information for the government organisations themselves, which avoids having to cope with the various barriers between the organisations. Thus, focusing the coordination on the interdependencies between systems, data and processes is in these situations a deliberate strategy to avoid having to deal with the interdependencies at the organisation and socio-political level[1].

5.1.1.2 Coordinating entities in a network

When it comes to service delivery networks, setting up or allocating the role of network administrative organisation – or network orchestrator – is seen as a good practice, provided that such an organisation has the political and organisational power to execute essential coordinative tasks, such as prescribing standards and setting up a basic infrastructure. Other parties in the network can then serve as a data source or as a channel in the service delivery. Furthermore, they can exchange information and processes through central data registries. The interviewees that were

[1] Note that the described situation does not apply to every situation in Belgium or Canada. For example, in Canada, various levels of government have a Chief Information Officer (CIO) with the power to coordinate the information management in the country. Still, collaboration between the various organisations and layers of government remains a key challenge.

knowledgeable of situations in which private parties are involved indicated that the government could serve as a trusted source of information, as authenticator, or as a network manager. The role of a central coordinating entity in a public-private service network will be discussed in the second part of this research phase, but in the interviews, we have seen various roles a government organisation can take.

Apart from allocating the role of network administrator to one of the actors in the network, we have spoken to some people about a network in the Netherlands in which the role of network administrator is assigned to a designated entity. That entity coordinates the interdependence in the network and has the legal power and control over the basic registry that is key for the organisations in the network. This is remarkable as one of the organisations in the network relies on the basic registry for almost all its activities, whereas some of the other organisations only need access irregularly. The large (government) organisation thus has high stakes in the continuity of the basic registry, but has to share power with the others other agencies in the network through the network administrative organisation in consultation and by mutual agreement.

A Belgian interviewee provided another type of coordinating entity; by controlling the information in a network, with an agency that brokers the information for an entire sector. In any case, contracts and agreements were found to play an important role in any of these coordination arrangements. Such contracts and agreements can be found on all levels. Networks, for example, have covenants, contracts, and other agreements between the partners in a network, both bilaterally – between organisations – and multilaterally. For achieving a certain level of quality of service delivery, service level agreements (SLAs) are often used. In such cases, organisations often do not have contracts with each other, but only with the network orchestrator, if present.

When looking at coordinating the interdependencies within an organisation, a coordinative entity that is part of the hierarchy is an approach found successful in our research. This entity can be a person or department with an overview over the activities in the organisation and the responsibility for aligning and managing the interdependencies that come with the services the organisation provides. This is both a strategic and an operational role, in which agreements and contracts play an important role, but cooperation and trust are equally important. SLAs can be useful, but if a service fails, the commitment of the actors involved and a mind-set of collaboration are – at that moment – more important for solving the issue than establishing that a party is not meeting its service level. Especially within organisations and within the public sector, good relationships are often more important than solid contracts.

5.1.1.3 Dealing with varying interests and responsibilities

In the networks that also comprise private parties, a leading government organisation is often positioned as network manager. However, that position is often difficult as the government has to warrant public and democratic values, but also has to facilitate the business of the private partners. In Canada, for example, there was a time in which re-engineering the state was a popular subject, with more room for the private sector and public-private partnerships (PPPs). However, the mandate was difficult and some (experimental) PPPs failed due to strong opposition (e.g. by unions), political difficulties, and (as some forces opposed more private sector involvement in public affairs) because there was little to gain for the private organisations. A lack of trust makes collaboration very difficult.

This, thus, is a balancing act for the government organisations involved. The contracts and agreements need to be stricter and better enforced than is necessary in cases of coordination within an organisation or within the public sector, in which public values need to be warranted by the public partners. In PPPs, the private sector is brought in to serve some role, and this role needs to be clearly demarcated. In contrast, in a public-private service network, the assembly of organisations already exists, but the burden of coordinating the service delivery over the various organisations and sectors involved shifts from the service consumer to the service providers. The interviewees indicate that in such situation, the role of trust and the focus on collaboration is even more important than in PPPs, which rely more on strict contracts. Still, in any case of private sector involvement, there needs to be something in it for the private partners and it is up to the public partners to ensure that the incentives for the private sector do not conflict with the values and benefits for the stakeholders in public service delivery, such as the service consumers, politicians, and tax payers.

5.1.2 Cross-organisational service delivery processes

5.1.2.1 Assigning roles and responsibilities

The roles and responsibilities of the actors in a network are discussed as part of the organisational level. However, it is on the brink with the process layers as in public-private service processes, the question is where the responsibilities of the government organisations end and that of the private organisations start. This is, of course, always a question in cross-organisational processes, but as the values differ between the public and the private sector, this question is especially important for the transition across sectors. Sometimes the boundaries of the responsibilities are very vague. An example was given by in an interview on a community set up by a public agency for interaction with software developers to improve the dialogue on the implementations of changes in the laws and interfaces offered by the public agency and the way the software developers implement this in their software. The public

agency plays the role of facilitator, participant and moderator. The question then is who is responsible for the information that is exchanged in the community and, by extent, for the actions (and any errors) that are a result of this information. The community is viewed as successful when many or most of the organisations in the area participate, but in such a large community it is almost impossible for the moderator (i.e. the government organisation) to check all answers that are given by the participants in the network. Still, the question remains; who is responsible if the exchange of such wrong information happens under surveillance of a government organisations. Does the presence of a government moderator validate everything that happens? In practice, the private parties in the community are not held accountable for errors on their part.

The interviews indicated that the clear allocation of roles, responsibilities and accountability is important. It is here where the organisational setting and the joint operation of a cross-organisational service delivery process meet. Therefore, it was identified as a challenge at the organisational level in the previous chapter, but is provided as a part of the coordination arrangement in this chapter. The respondent from the Belgian organisation told us about their solution: the organisation appoints a local administrator at the organisations in the network. This administrator is certified and becomes some kind of intermediary between the government and the people within the organisation. This administrator takes over the responsibilities from the government for the activities that 'his' organisation provides for the cross-organisational process. An important element of enabling proper accountability is logging the exchange of information and the milestones in a cross-organisational process. However, for networks with very intensive information flows, this can be very difficult. One of the organisations with whose respondents we have spoken to explained that they typically only log the outcome of an assessment or decision. For this, it is very important that the process is designed such that one can trust that the process behind that assessment or decision is executed properly. The control over how decisions are made is then based on control of the system, instead of individual transactions. If the coordinating entity has insight into how organisations execute their processes and the organisations can prove that they do not deviate from that situation, system-based control can be put in place, instead of the traditional transaction-based control, which requires less data on specific transactions as there is no need to prove the validity of every individual transactions but only of the system as a whole (cf. Yao-Hua Tan, Bjørn-Andersen, Klein, & Rukanova, 2011).

5.1.2.2 Coordination within and between actors

Government organisations attempt to improve their service delivery but at the same time there is pressure on them to operate as efficient as possible. These two values may be conflicting. A notable example we came across in various interviews was the

introduction and increasing use of electronic service delivery channels. Public organisations had great expectations of using the Internet as a new channel to provide services to citizens and businesses, at a fraction of the costs of providing services through other channels such as call centres. At many organisations, the online channel was setup to open up information. Later on, also transactional services were made available online. As traditional channels are also still used, information and service requests can be made through various service delivery channels. Even if an organisation has digitalised all its information and processes, the contact with clients may still use traditional (non-electronic) channels.

Channels have a variety of characteristics that can be employed in various ways to contact citizens and businesses. In order to offer the same services and information through all available channels (including future innovations), the organisation, processes and information behind those channels need to be configured independent of specific channels. From the cases we found that a (channel independent) shared information basis suits this purpose best.

A focus on developing the front office first, is seen to yield the fastest results. However, to ensure longer-term gains, the back office needs to be taken into account as well. An integrated approach to the organisation, the processes, and the systems behind channels is therefore necessary. This is especially important in networks, as a highly coordinated front office within an organisation may hinder the coordination of cross-agency service delivery processes. Some of the organisations that perform best are successful because they redesigned their (network) processes from scratch. For this, the starting point should not just be a channel strategy, but should also include the service delivery network and the other organisations that play a role in the service delivery structure.

Also within an organisation, a clear allocation of responsibilities is very important to execute any coordination arrangement. Also the coordination of multiple channels within one organisation cannot be realised over night, but requires a step by step approach, which also pays attention to elements such as creating an understanding and facilitating a shift in culture in the organisation.

We have spoken to some people from a large government agency in The Netherlands that undertook extensive front office transformation as it aimed to achieve consumer-oriented service delivery as well as increased efficiency in its interactions with its clients. Furthermore, to allow for the coordination of its multiple service channels and their corresponding departments, a single department was set up. Creating a department specialised in a multi-channel approach to service delivery ensured that a state-of-the-art front office was developed. As the front office was the main focus of the transformation effort, the organisation primarily achieved results in the area of service delivery. Both improved service delivery and increased efficiency in its

activities related to interactions with citizens were achieved. However, the back office applications and processes could not keep up with this transformation.

During the process of transformation, the organisation found that its current siloed organisational structure was not suitable for achieving its objectives. Without back office re-engineering, the long-term impact of the efforts are marginal. Although the enhanced front office structure proved to be very successful for managing the various channels of interactions with service consumers, it did not succeed in facilitating the transformation of the organisation as a whole. One of the interviewees pointed out: "you can build a fancy front office, but if the back office lags behind, this is of no use. The back office needs to be re-organised to accomplish the front office's goals". In an interview with a programme manager responsible for multi-channel service delivery he acknowledged that information technology does not solve all service related problems. It needs to be accompanied with changes in the organisational structure, as well as in the roles, responsibilities and culture of employees. He found that a main impediment to transformation was that the back office lags behind the front office re-design. Furthermore, he pointed out that the coordination entity is a line department as opposed to a staff department, which contributed to the impact of the department.

The assumption that control over service delivery can be improved by bringing the elements of the system inside the organisation, led another organisation to pursue a different strategy. With multiple interviewees we discussed how that organisation bundled its staff departments directly under the board of directors and took over the front desk function for their services from municipalities. The underlying idea is that when the coordination burden of managing the interdependencies with external organisations becomes too great, the functions are better coordinated within the hierarchy. The consequence is that the employees of this organisation are faced with more direct interactions with service consumers, which requires a different set of capabilities of the employees. Furthermore, there is an impact on the quality of service delivery as the number of face-to-face contact points was reduced dramatically and the service consumers now have to go to multiple places, as they also need to go to the municipality for a certain registration prior to going to the service desk of government agency in question.

From the interviews we find that the organisations that have adopted a network approach to service delivery have to define their role in the network, and the greater that role is, the more the coordination of the interdependencies within the organisation should be in line with the coordination of the interdependencies between organisations in the network. We will get to this in detail in the description of the case on the department of road transport. The Canadian and Belgian settings as discussed in interviews are also good examples of this. The organisations define their primary role in terms of the function they fulfil in the network. They aim to facilitate

the partners in the network in order to offer integrated service delivery to citizens and businesses. Being a trusted source of information that other partners in the network can rely on is an element of their role as they provide a shared information bases for the entire network. The coordination *within* and coordination *between* thus do not have to be conflicting. Also for organisations that are currently working towards improving their service delivery through multiple channels; if the processes and data sources are made channel independent, this breaks the silos within the organisation, which makes it easier to coordinate the service delivery of the organisation in such a way that the cross-organisational elements of the service delivery processes can be coordinated in accordance with the interdependencies that exist between this and other organisations in the network. To provide a practical example: a shared information basis that feeds all service channels within an organisation can also serve as a shared information basis in the service network.

5.1.3 Data and information systems

5.1.3.1 Shared data registries

To coordinate the interdependencies in a network that are related to data and information, the interviewees tell us that a shared and up-to-date information basis is important. That information basis is expected to become better available to organisations in the network by using basic or vital registries that governments are attempting to set up. Exchanging information through those basic registries has become important in service networks.

In The Netherlands, a lot of attention is put in establishing a system of basic registries, which is still under development. In the previous chapter, we have introduced the GBA, which contains the municipal records of citizens. In the case study in the next section, we will extensively discuss the basic registry on vehicle information (in Dutch: Basis Registratie Voertuigen, or BRV). Other registries include – among a variety of others –those on addresses and buildings (BAG) and on cadastral information. These registries are often managed by a government agency that plays a central role in the networks that use the basic registry. Besides these basic registries, there are a number of other standard building blocks for e-government in The Netherlands. 19 of these building blocks (including the national authentication facility DigiD, which was discussed earlier) are – along with six exemplary projects – part of the National Implementation Programme (in Dutch: Nationaal Uitvoerings Programma, or NUP). The NUP building blocks have the priority in advancing service delivery and e-government in The Netherlands. There are still many issues in the project, resulting in a code red in a gateway-review (Gateway-review NUP, 2009).

For cross-organisational service delivery processes that aim to provide an integrated answer to the service consumer, it is necessary that interactions be processed in real-

time, instead of batch wise, which was the case for some of the situations, we learned from the interviews. This sometimes hindered by legacy in the back office of organisations. In one of the organisations, multiple attempts to re-engineer the major back office system (over twenty years old) failed. As the development of a new back office system is a complex undertaking, the memory of a recent failure needs to have faded before a new attempt can be made, one of our interviewees told us. Therefore, recent changes have led to an uneven development of the organisation.

Sharing data registries is thus an important element of coordinating the interdependencies between the data in organisations in a network. On the other hand, building a network on one registry increases the impact of possible problems. Many organisations start exchanging vital information via one point, but in the transition phase organisations often maintain their own registries and do not (immediately) adapt their processes to work with the basic registry. In that case, multiple registrations on the same data objects are in place in the network and there is a risk that not all information is processed real-time and that – as a consequence – the basic registry may not always contain the up-to-date and correct information. This may lead to errors in the execution of processes and could damage trust between the partners in the network.

Two interviewees told us on how a Belgian organisation chose to focus on the technology layer and the basic services, leaving the presentation layer alone as much as possible. As said before, this organisation is a kind of information broker. But also when providing only basic information and services, issues with authorisation, authentication, and privacy play a role. As the presentation layer is not an issue, the question on how information is presented is not important. Data objects can be presented in a different form in all various channels at all the organisations, as long as the information is the same everywhere.

In the interviews with Canadians, a major impediment to collaboration was found in the fragmentation of government into layers with much autonomy. Furthermore, the sharing of information can be difficult, since there is a strong privacy watchdog. Still, sharing information is important, even if it is not automated. The exchange of information on a personal basis can ensure that the one-stop-shop has all the information it needs, and is up-to-date. The Business Service centres show that these hurdles can be overcome. Local regions in the Business Network have differences. Therefore they feature a one-stop-shop for the different programs people may need for their region. They can also relocate a request to other regions, if there is a need for a certain company in that region. Connecting the local one-stop-shop offices in the same network to each other is important. First, it allows the sharing of information at the network level, enriched with specific – local – information. At the information point for entrepreneurs, the information from the government at the federal level is

updated automatically while the information on the provincial level is derived through the contacts of the agency and is updated by the centre itself. This also applies for changes in laws and regulations. This is a workaround that puts quality service delivery first, even if the situation provides hurdles.

5.1.3.2 Interoperability and standardisation

In order to realise shared data registries and the exchange of information among the parties in a service networks, the organisations need to speak the same language. First, this applies to the technical language that should be either the same of be translated in order to facilitate interoperability between actors. As many organisations have always followed their own path in developing their information architecture and infrastructure, many different systems and interfaces are used. In the interviews, it became clear that many organisations are aiming to move towards service-oriented architectures and use converters to translate the different formats and standards of information being exchanged between systems at various organisations in the network. The aim is, however, to ultimately phase this out and to only interconnect directly between systems. As many organisations within the Dutch government developed architectures, systems and standards of their own, this introduces a coordination challenge for cross-organisational service delivery, as that requires full interoperability of the technical components in the network. In the Netherlands, this call for coordination gave rise to the development of a national reference architecture (for a comprehensive description see, for example, Lankhorst & Bayens, 2008). The Dutch Government Reference Architecture (in Dutch: Nederlandse Overheid Referentie Architectuur, or NORA) provides a common ground for developing the electronic government (e.g. Kenniscentrum, 2007) and has become the norm for various domain specific architectures (GEMMA for municipalities, PETRA for provinces, WILMA for water boards, and MARIJ for national government agencies). NORA consists of design principles arranged by an architecture framework based on the Zachman framework and models for the (re)engineering of (electronic) government service delivery (ICTU, 2007). The NORA is based on a Service Oriented Architecture (SOA), which is a fundamental principle, but it also includes specific guidelines. Some of those principles are mandatory (by law) and others are recommended. The task of this reference architecture is to guide public organisations in the direction of a responsive, demand-driven and efficient government. Standardisation and interoperability are an essential part of coordination in public-private service networks as the actors in these networks have at a certain point in time started with technology, without planning ahead to the interdependencies that come from integrated service delivery delivered in a network setting, with processes that cross organisation and sector boundaries. The challenge of coordinating fragmented data, stored in different formats, in various information systems, using

different standards, is still one of the major challenges that organisations face when aiming to realise cross-organisational service delivery, the interviewees say.

It is also in another – more literal – sense that organisations need to speak the same language. An often-used example is the concept of income, which is said to have as much different meanings as there are organisations that use it. But there are also examples of very common words, such as 'mother', that may mean different things in different contexts. A man that registers his new-born child will have a different idea of what to fill in the field 'mother' than someone who is handling his or her parents' pensions. This is one of the reasons why people rather go to a desk than visit a website; a simple question or assessment of the situation may resolve a semantic ambiguity. Semantic standardisation is therefore very important for collaborating in networks. However, especially in situations in which organisations have a large degree of autonomy, such semantic standardisation is a challenge in itself, which not only aims to support collaboration, but also itself requires collaboration to realise.

5.1.3.3 Coordinating information systems

Both the use (and challenges) of shared data registries and (semantic) standardisation, as well as the focus on interoperability, are related to the variety of information systems used in the service networks. However, the abovementioned coordination strategies are focused on the data interdependencies in the network, whereas a similar challenge exists within organisations. The variety of information systems and functional silos also benefit from improved interoperability. Also the use of a shared data registry is very important within organisations. Citizen data, for example, should not only be put in a basic registry by municipalities to serve other government organisations, but also serve as the unique data basis for their own processes. In practice, however, the functional silos often have duplicate information. Coordinating information systems is therefore not only a challenge between organisations, but also within organisations.

One important strategy is to align the architecture that is used to guide information system development within the organisation with the inter-organisational interdependencies. This is important to avoid a situation in which an increased coordination of information system development within an organisation breaks down the siloes within the organisation, but in so doing puts up new barriers around the organisation, making the realisation of cross-organisational service delivery processes even harder.

Coordination is also difficult in turbulent policy domains, with a strong political component and many changes in law, as it can be disturbed by ad-hoc changes initiated by (political) stakeholders. An example from one of the interviews is an organisation that is improving collaboration and moving towards the electronic

exchange of information (via web services) with other parties. Still, privacy and security concerns are often primarily dealt with in the legal arena, without any technological solutions being addressed. From a technological perspective, the architecture provides an overarching picture for adaptation of the infrastructure. However, while this architecture is used in stable times, "in politically turbulent times, the architecture is often surpassed", an architect told us.

In Dutch municipalities, a popular approach to connect the (in some cases about 100) silos in the back office with integrated services in the front office is called 'mid-office'. The mid-office layer is used for process- and data integration within the organisation. It is a (temporary) solution for dealing with back office systems that cannot provide an integrated view on the situation of a service consumer, that are not available 24/7, or that are not equipped (e.g. in terms of performance and security) to support external access. The mid office is an instrument for municipalities in the transition from silos to new (service oriented) architectures and consists of registries on cases, products and citizens. Furthermore, generic functionality such as document management is often included.

The situations of large government organisations that were discussed in the interviews focused more on electronic interoperability with other agencies. It must be said that these organisations often have less services and products than municipalities (that is, when counting the number of products and services, not the number of individual service consumers). If data is shared electronically, the processing of this data can also be done electronically. From a series of interviews discussing the social security domain in The Netherlands, we learned that a major organisation has automated the processing of almost all information that is submitted electronically (e.g. by a citizen through the website). An example from this organisation is that when they receive a notification from a municipality that a new child has been registered, the organisation will contact the parents pro-actively by sending a form. This form is limited, as the service network already knows most information. Basically, the agency needs to know the bank account number to pay child support. If the parents already have a child, even this information is already known. However, the organisation also has to cope with legacy systems, which processes certain changes in information batch-wise (overnight) and is not available 24/7 (there is a two hour downtime at night). If a service network wants to provide 24/7 availability of integrated services this is limited by the weakest link (in this case a legacy system at one organisation).

5.1.4 Wrap up

When analysing the wide variety of coordination strategies we encountered in our interviews and discussions, we found two general dimensions of coordinating the interdependencies that arise from service delivery:

- Horizontal, across actors;
- Vertical, across layers.

From the interviews it became clear that for service networks, it is very important to not just focus on interdependencies between actors at multiple layers, but also at interdependencies between those layers.

Within organisations, multiple departments perform activities that are part of the same service delivery and they coordinate their activities among themselves. As departments often have a relatively large degree of autonomy, coordination requires cooperation. Agreements and contracts can offer some assistance, but cooperation is essential. Many organisations coordinate at the level of information systems or departments. This can – for example – be done by mapping all service delivery channels to the system and registries shared by the entire organisation, and by synchronising multiple information systems. If this is done in real-time, the information is consistent across all channels. However, many organisations still work batch wise, resulting in delays in synchronisation. The dependencies between departments go beyond mere dependencies between information and activities. If departments are not held accountable for the way they operate, it becomes hard to coordinate activities throughout the entire organisation. For many organisations, an integrated approach entails a fundamental change in the way they work, as was also found in the stage model literature discussed in chapter three. This change in culture needs to be accommodated as well. One organisation, discussed in multiple interviews, set up an orchestrating department, responsible for coordinating all that was related to service delivery through multiple channels. This department was also responsible for creating awareness of the dependencies in the organisation, and can be held accountable. This is only possible because this department has sufficient power and competences to direct other departments and hold them accountable for their parts. Besides the collaborative stance, the coordination department needs to be able to rely on a formal authority, in case cooperation fails. Which might happen, as the placing the coordination role in one department requires other departments to relinquish some of their autonomy.

The coordination strategies used to deal with the interdependencies within an organisation should acknowledge the interdependencies that exist between organisations in the network as well. At all the various layers that we used to describe the coordination strategies in this section, strategies can be found that pertain to both the interdependencies within an organisation and those between organisations.

We see that both within and between organisations, formal coordination mechanisms such as agreements and contracts are accompanied with less formal mechanisms, such as trust and cooperation. However, within organisations there is more room for setting up an actor with the power and authority to coordinate, but even there a

collaborative approach is important. In a network with public and private partners, such an authoritative approach is less feasible, and the coordination of interdependencies at that level include a mix of contracts, agreements, a clear allocation of roles and responsibilities, and informal methods of coordination.

There are various potential roles for a network administrative organisation, which is limited by the socio-political environment of a network. Even though such an organisation has typically less authority to enforce a certain coordination strategy in a network, it can help if the coordination within the organisations in the network is assigned to designated departments, as this makes it clear for the network administrator who to talk to as it has a sort of local counterpart (a local administrator) at each network partner. A coordinating entity without an organisation can thus function as a sort of one-stop-shop for the partners in the network.

What is also clear from this section is that interdependencies not only exist at the separate layers, but also between the layers. In Belgium and Canada, the political environment is such that it is rather difficult to coordinate at the level of organisations. As a consequence, the coordination effort is focused on the information or data level. Coordination on the data or technical layer can thus reduce the coordination burden on the organisational or political level. In other situations, the automation of cross-organisational service delivery seems to be a technical challenge, whereas the parties are able to coordinate on an organisational and inter-personal level, for example by agreeing on a reference architecture or a national implementation programme.

In summary, from this series of interviews, three lessons can be learned related to the layers:

- Like the coordination challenges, coordination strategies can be found pertaining to various levels, ranging from the socio-political environment to the technical level;
- These layers exist within organisations, but also between organisations. This study illustrates that the coordination of service delivery networks does not occur on one level only; it is not a project that needs to be managed by (for example) tight contracts, nor just a series of process steps, but the network is full of interdependencies on all levels; and
- The layers are themselves interdependent; a strategy can include a coordination emphasis on one layer when in other layers the coordination challenge is greater or potentially insurmountable.

Related to the findings of chapter four, the interviews show that coordination covers coordination challenges at multiple layers. In the second part of this chapter we discuss the case of the Dutch Department of Road Transport, the RDW. In this case we

investigate the entirety of the coordination mechanisms in a public-private service network. According to independent experts we have spoken with, this case could be the only public-private service network in The Netherlands and it covers almost every element of coordination provided in this study. It is therefore a case that enables us to research the full breadth of coordinating public-private service networks.

5.2 Coordinating a public-private network: RDW case study

In chapter three, we have defined a coordination mechanism as a set of methods to provide tools for managing interdependence. To understand the entirety of that set, we studied a case internationally recognised as having realised efficiency gains and improved service delivery (Undheim & Blakemore, 2007). For this case study, we interviewed six persons, including the two directors of the RDW, a manager at the RDW, representatives of the sector association of businesses in the motor vehicle industry (BOVAG), and an external consultant. The number of interviewees is limited, but we sought the full breadth of coordination in the network, which only people with a complete overview could provide. Also, we investigated the possibility to consult a large number of entrepreneurs in the vehicle industry, but during the planning of this, it became clear that the BOVAG could provide the same and more information on the business perspective. Furthermore, we corroborated our results with document analysis on studies that included the RDW (Millard, et al., 2004; Programma Architectuur Elektronische Overheid, 2005; Undheim & Blakemore, 2007) as well as factual documents from the organisation itself and from the Dutch Government (e.g. RDW, 2009).

5.2.1 Introduction to the case study

The Dutch Department for Road Transport, the RDW (originally derived from the Dutch name Rijksdienst voor het Wegverkeer, but according to the law the official name is Dienst Wegverkeer and the common name is RDW (Dutch Government, 1994)), is a ZBO; a legal entity under public law which performs its tasks as an independent organisation that executes tasks for the Dutch Government, primarily for the Ministry of Infrastructure and the Environment. The RDW guards the environmental and safety aspects of the vehicles in The Netherlands. The key functions include the admission of vehicles (and its components) to, based on Dutch and European regulations. Vehicles that have been admitted get a vehicle registration certificate and a license plate. Another function of the RDW is thus issuing documents. Also, the RDW periodically checks the safety of cars as long as they are on the road. Furthermore, the RDW registers the information of vehicles, their owners and the documents issued for the vehicles in a basic registry; the basic vehicle registry (in Dutch: basisregister voertuigen, or BRV). This registry is also used for information provisioning, for example towards authorities in order to combat fraud and crime

related to vehicles. To sum up: the RDW supervises vehicles from cradle to grave, both technically and administratively.

The RDW plays a central role in what is often called the 'vehicle chain' in The Netherlands. Furthermore, as the RDW provides a basic registry that is used by a wide variety of organisations, the organisation plays a role in several networks. Apart from the network concerning the vehicle chain, the RDW is in networks built around the driving licence, law enforcement, vehicle taxation, and parking. These networks focus on different (public) tasks and are sometimes overlapping when it comes to the actors that play a role in the networks. We take the perspective of the service consumer. More specifically, we focus on the network pertaining to citizens buying and owning a car. The admission phase is thus not part of our case study, but in the case we do discuss the periodical technical and environmental checks and the potential relationship with law enforcement. Furthermore, as the network around parking products (initiated by municipalities) is still in its infancy, this is not included. Nor is the driving license network, as – for the process of buying and owning a car, the document only serves as an identity document.

We discuss the network in terms of the organisations that are involved and by describing the steps in the vehicle service delivery process in that network. We do not separately discuss the IT and data layer, as the shared data registry fulfils a central role in the network and is therefore discussed in various places in the case description. Ultimately, we discuss how the public-private service network is coordinated.

5.2.2 The complexity of the network

The essence of the complexity of the service delivery in this case is best described in terms of the four characteristics of a network, that are discussed by De Bruijn and Ten Heuvelhof (2007): pluriformity, interdependence, closedness, and dynamic.

The *pluriformity* is found in the variety of actors involved. The RDW itself plays a central role, as it holds the basic registry vital to this network. Furthermore, it is a government organisation with a task set by law. However, the network further consists of many other organisations, which differ in nature. There are other government organisations that make use of the basic registry, but there are also many small businesses (like car dealers and garages) that come from an entirely different domain and are not primarily concerned with maintaining a public ICT infrastructure facility. Their benefits of contributing to the network include a lower administrative burden and possibly reputation gains, which can be valuable in an industry with varying reputations. Furthermore, at an operation level, these businesses interact with the RDW directly, as they make use of ICT facilities to register changes in the vehicle registry (e.g. change in ownership if a vehicle, outcome of technical check,

status of vehicle). On a policy level, they primarily interact with the RDW through the trade association (BOVAG). On a technical level the RDW needs to deal with legacy information systems and at the same time accommodate a variety of parties with different ICT capabilities, ranging from the police to an individual mechanic at a garage. The technical landscape is not a green field. Therefore, pluriformity is not just related to the actors involved, but also to the information system landscape, which is fragmented over the various actors.

This is related to the *interdependence* that exists in the network. Being the object of study, the interdependence is discussed in detail below. Briefly, it comes down to that the RDW depends on thousands of businesses to maintain a quality basic registration, which at the same time serves those businesses and is a vital source of data for other authorities. Being an ICT enabled network, this interdependence goes deeply into the operations of all organisations involved. There are millions of changes in the registry per year, done by thousands of organisations. The interdependence therefore needs to be dealt with in a systemic way, as the number of transactions is far too great to deal with interdependence at the level of individual transactions.

De Bruijn and Ten Heuvelhof (2007) describe that actors in a network are not perceptive to hierarchical control ('closedness'). In the case, primarily the private parties have large degrees of autonomy. In the detailed description of the case, some issues are described that follow from this characteristic. Related to it is the dynamic of a network. In the RDW case, this is limited. The RDW is allowed (by law) to prescribe the way of contact. Furthermore, the policy domain is relatively stable (e.g. when compared to networks operating in social security) and the RDW is marked by continuity in the internal management. As other public-private networks may operate in a less stable and more dynamic (or turbulent) domain, the way the network in the RDW case is coordinated may be difficult to implement in other networks due to this characteristic.

5.2.3 The organisations in the network

The case setting thus revolves around a citizen that buys a car, either from a private individual or from a car dealer. The car is registered on the name of the citizen and he or she buys car insurance. The citizen also automatically receives a notification about the vehicle tax. Note that even though the case is on buying and owning a car, the situation applies to most motorised vehicles.

An interesting element of this case is that the RDW provides a service to a citizen through a private organisation. A car dealership that sells a car can (when certified) transfer the registration of ownership of the car towards its customer. If a citizen buys the car directly from another citizen, they can go to the post office, to arrange the transfer in ownership there. Car dealers and citizens can also use the post office, for

example if the car dealer is not accredited or because the post office accepts more types of identification documents. In any case, the citizen is facilitated by the RDW to handle the necessary interactions with government as part of the service consumer process that is the origin of the contact with government. The service consumer process is selecting and buying a car, and everything related to that. For many government services, the citizen would need to visit a government website or visit a municipality. In this service network, however, everything is handled at a logical point in the original process, thereby reducing the coordination burden for the service consumer. The companies could be considered service delivery channels of the RDW (a view on service delivery we have discussed in e.g. Janssen & Klievink, 2009; Klievink & Janssen, 2008b, 2011). The interesting element is that the citizen is a service consumer of the RDW, where the car dealers and the post offices are part of the service delivery structure of the RDW, but are also a service consumer of the RDW. They, thus, have a role in the network both as service provider and at the same time as service consumer. This has interesting implications for the coordination mechanisms that are employed.

Before we discuss the coordination in this network, we first describe the organisations in the network and their primarily roles and responsibilities they have regarding this case.

5.2.3.1 RDW

For the government, the vehicle registration is the most important component of this case, as this registry is used for various (government) services and tasks, as well as for a security document (the vehicle registration certificate). As keeper of this basic registry, the RDW plays a central role in the network. Nonetheless, the RDW is (almost) invisible to the buyer of the car, which is a consequence of the service structure in which private parties offer the 'office window' for the related government services. This is beneficial for the service consumer, as the government service is offered nearby either physically (i.e. a post office nearby) or logically (i.e. the place where one purchases the car). The RDW thus has a number of service consumers: other government organisations in the network, parties in the private sector (including the partners in service delivery and their interest groups), and the final service consumer of this service; the citizen.

5.2.3.2 Motor vehicle industry

The businesses in the motor vehicle industry are an important direct service consumer of the RDW. Dealerships (whether in cars or in other motorised vehicles) can offer their customers the service of transferring ownership of a car, for which they use an application that the RDW offers. Other organisations in the industry (such as garages) can also use RDW applications for transferring ownership and other tasks.

These other tasks include the periodical safety checks (in Dutch: Algemene Periodieke Keuring, or APK) and the online registration of their inventory (in Dutch: Online Registratie Bedrijfsvoorraad, or ORB). Only companies that are accredited (for individual tasks) by the RDW to perform these activities can use these applications. For APK inspectors, the accreditation is even at the level of an individual mechanic, who needs to be certified by the RDW in order to perform a valid APK. As there are many companies in the industry, consultation and agreement is sought with the interests groups of these industries, such as the BOVAG.

The relationship between the RDW and the companies in the motor vehicle industry is contractual. The instruments that the RDW uses are accreditation and certification of companies or individual mechanics. The accreditation for transferring vehicle ownership is called – in Dutch – 'bevoegdheid Tenaamstellen Voertuigbranche', or TV. Other accreditations include the already mentioned accreditation for APK and ORB. Many companies are both accredited for their inventory and for changing vehicle ownership, whereas some garages only are accredited for performing APK checks and some dealers do not have an APK accreditation. The RDW carries out spot checks of the accredited companies.

5.2.3.3 Post offices

The post offices in The Netherlands are co-owned by TNT Post and ING. More and more services are moved from the traditional post offices to those of TNT (TNT-Postkantoren), as the ING is retreating from this market and is transferring its services from post offices to its bank offices. As a consequence, the number of post offices that can provide RDW services is limited. Therefore, in 2010 the RDW enabled TNT-Post offices to provide the RDW services as well.

At a post office, the new owner of a car can register the car on his or her name. For this, the new owner needs to identify him or herself and show the vehicle certificate of ownership and the transfer certificate. Both documents are part of the vehicle registration papers. When the ownership has been transferred, the buyer receives a new certificate of ownership for the vehicle and a certificate of indemnification for the seller. For the seller, this is proof that he or she is released of liability for the car. The seller can then finalise the sale by giving the buyer the third (and final) part of the vehicle registration papers (the vehicle certificate) and, of course, the vehicle.

5.2.3.4 Insurer

In The Netherlands, as in many other countries, a vehicle needs liability insurance, as set by law (in Dutch: Wet Aansprakelijkheidsverzekering Motorrijtuigen, or WAM). Thus, the citizen that buys a car has to insure the car. The insurer can use the license plate number to gather information on the car at the RDW registry. When a car is insured, the insurer notifies the RDW. This way, organisations in the law enforcement

network (especially the police) can use the vehicle registry to check whether a car is insured or not.

5.2.3.5 Tax and Customs Administration

The RDW registry also serves the Tax and Customs Administration by providing data on vehicles and their owners. Based on this, the Tax and Customs Administration determines the vehicle tax and is also responsible for collecting this. Thus, based on the information in the basic registry, the Tax and customs administration automatically taxes the new owner of the car. So, also for this mandatory government service, the service consumer does not have to file taxes, but the government organisations act pro-actively based on the information available in the service network. For cars that are registered for the first time in The Netherlands (new or imported cars), the RDW guarantees the Tax and Customs Administration that the necessary taxes (including VAT) have been paid.

5.2.3.6 CJIB

The CJIB (in Dutch: Centraal Justitieel Incasso Bureau, which translates as Central Fine Collection Agency) is an agency of the Ministry of Safety and Justice and is responsible for – among other things – collecting fines for traffic offences. The CJIB thus plays a role when the owner of the car violates traffic regulations, which often also involved the police. In severe cases, also the police, the prosecution service and ultimately the court can play a role. Note that the owner of the vehicle is responsible for the vehicle. Thus, if the insurer does not notify the RDW in time (within 28 days) that a car is insured, the owner of the car will be addressed.

5.2.4 The service delivery process

The case basically consists of two discrete and three continuous processes, in which the discrete processes are initiated by an event in the life of a citizen: buying a car and (consequently) insuring it. The first continuous process is that the Tax and customs administration taxes the owner of a car for vehicle tax. A new owner is taxed automatically, triggered by a change in vehicle ownership in the basic registry of the network. The other two continuous processes are the periodical safety checks and law enforcement.

Of course, this is a rather simple representation of the processes in the case, from the perspective of the final service consumer, which is the person buying a car. There are many processes that run in the background, invisible for the citizen, but key to the proper functioning of the network. Many of these 'hidden' processes are mechanisms for coordinating the interdependency that follow from the abovementioned five service delivery processes. They therefore are discussed in terms of coordination, in the next section. In this section, we briefly discuss the five service delivery processes,

each in turn. **Figure 7** visualises the organisations and their place in the service delivery structure of this network.

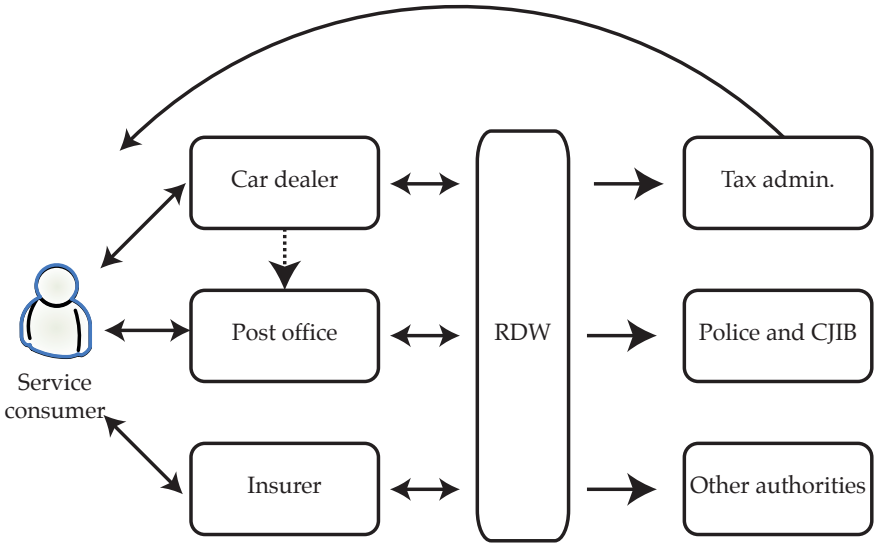

Figure 7: **organisations involved in the network**

5.2.4.1 Purchasing a car

A citizen buys a car. To ensure an up-to-date data registry at the RDW, it is important to know the owner at every point in time for every car on the Dutch roads. If, for example, a traffic enforcement camera detects speeding, the fine should go to whoever owns the speeding car at the time of the traffic regulation violation. A change in ownership must therefore be registered immediately. The citizen has, however, no direct contact with the RDW. Many processes of the RDW are in fact put out to businesses. The businesses in this case include vehicle dealerships, garages and the post offices. Recently, the interactions between the RDW and the citizen have been increasing due to more openness of the vehicle registry, an app for mobile phones, and electronic letters to citizens through the Message box, which is now part of the My Government website. The electronic letters replace paper letters on an opt-in basis. It is expected that in the future more direct interactions between RDW and citizen will occur, driven by future developments such as changing vehicle ownership online and developments in the area of a digital vehicle certificate. A next step in electronic service delivery does, however, require a higher level of authentication that is currently provided for by DigiD.

The RDW offers web applications for its partners in the network. A vehicle dealer can login, based on its RDW accreditation. With the application, the car dealer can change the ownership of the car. An RDW accreditation is not mandatory for car dealers, but is a prerequisite for those car dealers that want to perform RDW services, such as transferring vehicle ownership. In practice, car dealers can barely do without an RDW accreditation. The possibility for car dealers to transfer vehicle ownership was created in 2001 and saves the car dealer a trip to the post office with the customer, which was necessary before car dealers could perform this function. When a citizen buys a car at an accredited car dealer, the dealer will put the car on the name of the customer. The GBA (the civil registration) feeds citizen data to the RDW, thus the primary address information in the BRV (the basic vehicle administration) is derived from the municipal records. The private partners in the network have no dealings with this, as the applications they use work on the RDW registration, not on the GBA. Once the new owner of a car is registered in the BRV, the dealer can print the new certificate of ownership by printing the registration data on a blank certificate. Finally, the citizen can use DigiD to log in to the My Government website or the site of the RDW and consult the registrations of vehicles on his name.

For performing the function of transferring the ownership of a vehicle, the dealer depends on the availability of the systems of the RDW. Therefore, the dealer is both a partner of the RDW in the service delivery towards the citizen and at the same time a service consumer of the RDW. Other partners of the RDW are equally dependent on the RDW, also for their primary processes. Examples include the police and garages or service stations that wish to perform an APK inspection on a car. As the RDW registration has such an impact on the processes of other organisations, the RDW has a strong focus on continuity in its coordination of the internal organisation (coordination within) and of the network (coordination between).

5.2.4.2 Insuring a car

A car needs to be insured. So when purchasing a car, the citizen needs to get an insurance policy from an insurer. The insurance company notifies the RDW that the car is insured. Based on this notification, the RDW registry is updated. Contrary to the certificate that the dealer hands over to a citizen, insurance is something between the insurer and the policyholder and there is no direct proof to the citizen that the insurer has in fact notified the RDW. As notifying the RDW does not always have the priority of some insurance companies, it may happen that the RDW is not notified in time. In that case, the RDW does not know that a car is insured and sends a letter to the owner of the car, as it is the responsibility of the owner that a vehicle is insured. Note that citizens can lookup whether their vehicle is insured on the website of the RDW or on the My Government site. Still, as this is an undesired situation, the RDW has frequent meetings and consultations with the partners in the network.

5.2.4.3 Vehicle tax

Based on the information in the BRV, the Tax and Customs Administration taxes the new owner for the vehicle, and compensates the previous owner. This tax needs to be paid periodically, which is a direct process between the Tax and customs administration and the citizen. Within the total taxes is a provincial tax, which is collected by the Tax and Customs Administration. Even though paying taxes may not be a citizen's favourite task, the administrative burden is kept low as the taxation is initiated by the registration at the RDW and is collected by one organisation even though there are two that receive the tax.

5.2.4.4 Vehicle test

Vehicles need to be regularly tested (the frequency depends on the age of the car and the fuel): the APK (Algemene Periodieke Keuring, in Dutch). The APK is mandatory (under Dutch and European law) and is aimed at improving traffic safety and protecting the environment. For the APK inspections, the RDW works closely with partners in the vehicle industry, such as garages. Again, garages need an RDW approval, as do the individual mechanics that inspect cars. The inspector personally logs in the RDW systems, which enables the government to track, for all vehicles, which inspector has inspected what vehicle at what time. Authorised companies are spot checked, at random, but with the provision that every company is checked occasionally. This is necessary to ensure that fraudulent companies are identified sooner or later.

5.2.4.5 Law enforcement

Typically, as long as the owner or driver of a car abide by the traffic rules, the CJIB and Police stay out of the picture, except for routine checks. In case of a traffic violation or for routine checks, these authorities do have access to the BRV, and with it, to the current data of every (Dutch) vehicle on the Dutch road. The BRV provides the information on the vehicles to these and other authorities.

5.2.5 Coordinating the network

The actors in the network exchange data through the basic registry BRV. As such, the use of a shared data registry is a key mechanism for coordinating the interdependencies of data in the network. However, the use of such a central registry enables the advanced structures for the provision of services and the facilitation of a variety of networks. As such, the registry is used in network operations that bring many interdependencies at a variety of layers beyond the data layer alone. The RDW case is particularly interesting as it features a full public-private service network with a coordination structure that covers interdependencies on the various layers we have discussed earlier.

5.2.5.1 Governance in the network; the leading organisation

According to the directors of the organisation, the RDW has achieved its current good standing in the network by continuously focusing on collaboration and on being a reliable partner for the other organisations in the network. The association for businesses in the vehicle industry confirmed the constructive and collaborative approach in the network. Furthermore, as for most – if not all –government organisations, service consumers do not have a choice as to where to turn to for the tasks discussed in this case; the RDW is always part of the vehicle administration processes. The RDW sees its 'monopolist' position as an extra obligation to perform its tasks in the best and most efficient way it can. This vision has a major impact on the governance of the organisation and coming to the coordination mechanisms as described in this section takes time, much effort and a strategy.

The RDW became a ZBO about 15 years ago and has the authority (by law) to determine how interactions in its network should take place. However, when it comes to governance of the network, an authoritative approach to leading the network is not good enough, according to the interviewees at the RDW. The role of network coordinator has to be earned and awarded by the partners in the network. Developing relationships is very important in this respect. Relationships build over time and are influenced by the attitude and behaviour of the organisations involved. The way that the RDW has focused on collaboration has led to a situation in which the partners concede the network coordination to the RDW. As we have also seen in the interviews in the previous section, an actor does need the formal authority to fall back on, but a collaborative approach is key to successfully coordinating networks. An example of this attitude is found in the way APK inspectors are treated. They are employees of garages and dealers and are seen as both an extension of the RDW organisation (as they perform a certain task) and as a target group that needs to be treated well. As such, the board of the RDW does not believe that collaboration can be imposed in a top-down fashion, which seems to be an approach to establishing networks that is considered by some within government (Bureau Beleidsonderzoek, 2010).

Consultation and mutual agreement are thus very important, especially in the early stages of the processes of enacting the network or changing its operations. Formal authority is then needed to enforce the rules and agreements of the network. The law provides room for the RDW to prescribe the way of interacting. For companies in the vehicle industry, it is important to interact with the RDW. Thus, organisations from the private sector are heavily involved in this network. However, they do have different values than the public partners and there is a prominent legal component to discussions between the parties. It is not unheard of that some private organisations show opportunistic behaviour, and that – as the network has a public task to perform – this needs to be dealt with. As such, without formal authority, the intensive collaboration found in this case would not be possible. The minister is ultimately

accountable and the arrangement in the network needs to be such that the minister can uphold this responsibility. Furthermore, when the group of actors that violates the agreements is small, the rest of the private organisations benefits when this small group is punished, e.g. because negative behaviour reflects negatively on the image on the group as a whole. The RDW has a system to impose sanctions to organisations that are accredited by the RDW. This system starts with a formal warning and may eventually lead to a suspension of the party.

An important instrument for governing the network is the accreditation that the RDW provides to businesses in the vehicle industry. Accreditations determine which functions organisation may perform in the network and some forms of accreditations were discussed in § 5.2.3. For the businesses, being accredited is important. Accreditations are often perceived as a form of government approval for the business, although in fact they only reflect that an organisation is certified to perform certain activities, such as the APK inspection or transferring vehicle ownership. Spot checks are the main instrument of checks and enforcement of the obligations that come with accreditation.

Due to its public tasks and the fact that many organisations rely on the RDW for some of their activities, the RDW regards public accountability as very important. The organisation is a member of the Charter group for Public Accountability (in Dutch: Handvestgroep Publiek Verantwoorden, or HPV). The members of this group abide by the Governance Code for Autonomous Administrative Authorities and explain their public governance and its structure, not just as a form of accountability towards the minister, but also towards society. Furthermore, the annual report of the RDW contains a VIR statement about the way the agency deals with information security (in Dutch: Voorschrift Informatiebeveiliging Rijksdienst, or VIR). Also, the organisation has EDP (Electronic Data Processing) audits to assure the partners in the network that the information processing of the RDW is correct. As such, it is a tool of accountability towards the network partners, but it also helps the internal organisation, as any errors that come up provide room for improvement.

5.2.5.2 Consultation and mutual agreement

To get the most out of collaborating in a network, the organisations involved have to acknowledge each other's interests and align and attune their competencies and capabilities. As we also found in the theoretical background, conflicts of interests cannot always be avoided and have to be dealt with. In this case study, the network deals with conflicting interests by intensive consultations. By acknowledging each other's interests, these interests can be considered in the choices made in the network, which often abide by the creed 'live and let live'. As the service delivery, the registries and processes are all stable, there is the time and stability needed to cope with differences in interests and to progress the collaboration, the interviewees say.

When changes in the service delivery structure occur, for example enabled by technological advances, this may change the role that certain partners in the network can play. If the dominant actors neglect the interests of others, those parties may resist change. However, if the leading actor acts in a predictable way and communicates early on in the process, time and room is created in which the parties can adapt to the changing situation.

Complex changes in the way the RDW and the network works require changes in law. Therefore, the minister is an important stakeholder that needs to be kept involved. Furthermore, when it comes to legislation, the European level plays an increasingly important role. A result of this is that change processes that require changes in legislation take longer than changes that can be made within the existing rules and procedures. The vehicle industry finds this inconvenient. Therefore, the RDW tries to communicate as clear as possible to manage expectations. Furthermore, the BOVAG can assist in the communication towards its members as well as 'translating' RDW messages to make them easier to understand for car dealers and garage owners. As the law is not opened up easily, the RDW actively seeks for input when it is opened, by invoking intensive dialogue with the partners in the network. Of course, not every theme requires input. Tariff rates, for example, are communicated and explained (substantiated) to the parties in the network, but are not subject of deliberation with the partners in the network.

5.2.5.3 Relationship management and escalation procedures

The interests groups of the private organisations in the network actively contribute and support the network structure and operations. The consultations mentioned above are an important element. Thus, at a strategic level, the interaction is constructive. At the operational level, however, the interactions are less based on collaboration and are more conflicting in nature as these interactions often deal with incidents. In such cases, individual companies have a disagreement with the RDW and are supported by their interests group. Still, there are many (millions) interactions between the organisations in the network and almost all of them are without problems. Here above, we have discussed the consultations at the strategic level; there are meetings at the level of the boards of directors of the RDW and the interest groups, but interactions and consultations occur on multiple levels.

As relationships are so important in the network, the RDW has a specialised relationship management department. The various parties in the network – e.g. the police, the BOVAG, insurance companies –have a relationship manager and can contact this person with complaints, incidents or wishes and requirements for future changes and improvements. Also an organisation like the BOVAG has a dedicated role to orchestrate the interactions with the RDW in an attempt to avoid numerous lines of contact between various layers of the organisations.

The relationship managers of the RDW are the first in the organisation to be informed of issues that arise in the operations of the network. If such issues are recurring or if complaints are founded, the relationship manager discusses them with relevant actors within the RDW, for example the ICT department if the issues are related to ICT. Issues that transcend the level of incidents are discussed in a policy platform. Requirements and wishes of the interests groups are sometimes also taken directly to such a platform. The actors in that platform, often representatives of line departments within the RDW, assess whether the issue requires or justifies a certain change in the way the RDW operates. Topics of fundamental nature can be transferred to a steering committee, which is at the managerial level and can advise the minister.

For the relationships in the network, it is very important that problems do not simmer for too long. Therefore, there are escalation procedures. Issues that are not solved at the operational or policy level may be escalated to the meetings of the boards of directors of the organisations involved. Based on their assessment, an issue is fed back to a policy platform, or escalated to the ministry.

Finally, there is also the relationship between individual companies (e.g. members of BOVAG) and the RDW. The interactions are at the operational level: access to RDW applications, the mechanism of accreditation, training, and spot checks of the organisations.

5.2.5.4 Continuity as the hallmark of governance and public value

According to the interviewees at the RDW, operational management and governance, and public value can be realised at the same time. The binding element between the two is continuity of operations.

Because the basic registry at the RDW and their coordination of the network has a large impact on the processes of other organisations, continuity is the hallmark of the operations of the RDW. Continuity and legal tasks have the highest priority. Next in line of prioritisation is realising public values, primarily high quality service delivery and innovations in service delivery. Only after this, there is room for other aspects of operational management, such as optimising processes and improving efficiency.

Continuity is important as the operations of the RDW affect the processes of others so much. The RDW has to be, and wants to be, a reliable partner for the other organisations in the network. In that sense, continuity is a public value as well in the sense is contributes to being a reliable government.

Due to the focus on collaboration and continuity, the network provides a stable environment that provides room for improving processes. Due to the continuity in its service delivery to partners in the network, the RDW has enabled service consumers to use the post office for the transfer the ownership certificate between private individuals. Furthermore, citizens can handle the required interaction with

government at a car dealer or garage as part of the business they have there. Other actors in the network trust the RDW in coordinating the network, our interviews show. As far as the RDW is concerned, improving the performance of the organisation and of service delivery can be realised at the same time. Still, improving the performance of the organisation and improving service delivery are two separate lines of reasoning. Whether changes will improve both depends on the priority; if efficiency is deemed more important, this may have a negative impact on service delivery. However, if the organisation thinks about public value and will only improve the operations of the organisations (in the form of efficiency and process improvement) in case such improvements will also contribute to the realisation of public value, both can be realised at the same time.

5.2.5.5 Agreements and service levels

The interdependencies at the level of information systems and data also require coordination, which is focused on continuity. The RDW notifies partners in the network of maintenance of the systems, which is always outside of office hours and takes place within a limited timeframe (i.e. six hours). Furthermore, the RDW has well-functioning temporary provisions in place for the registration processes. Car dealerships and garages often do not even notice when they are dealing with such a temporary provision.

Furthermore, the RDW has SLAs (Service Level Agreements) with service providers to require of them a certain level of availability towards businesses in the vehicle industry. In turn, the BOVAG and its members have SLAs with these service providers. The uptime that is agreed on in the SLAs is also met in practice. The main purpose of the SLAs is to keep everyone focused on upholding the continuity of the services in the network.

Finally, the formal agreement and coordination mechanism that is central in inter-organisational interaction is the accreditation mechanism and the checks that are performed on accreditations. There is a legal standard (i.e. 3%) for the portion of the APK inspections that have to be spot checked (i.e. checked again) by an RDW inspector.

5.2.5.6 Organisational change

In order to improve both operational management and public values, most notably service delivery, the RDW has paid much attention to the organisational culture in the past decade and a half. Three components were highlighted: responsibility for results, customer centeredness, and collaboration. The organisation used to perform poor on these points, which is why they were put at the centre of attention. For this, the management of the RDW maintains personal contact with the middle managers. They are important for translating the decisions of the top management to the rest of the

organisation, and thus necessary to keep the internal organisation in motion. There is a (18 month) program dedicated to development of competencies and capabilities of the middle management. Besides training middle management, unit managers are stimulated to get in touch with the network more often. The management team organises meetings with the "internal customer" (the partners in the network) to get a better view of the partners in the network, which makes it easier to take them into account in governance and policy. Overall, the RDW attempts to secure the idea of thinking from the outside in, in the entire organisation, at all levels. With this comes more authority for the various layers in the organisation, but also more responsibilities when it comes to realising the goals of the organisation.

The partners in the network, the *internal* service consumers (i.e. internal to the network), are more powerful than the *external* service consumer (e.g. citizens), as they are closer to the action. As is obvious from all of the above, there is a lot of contact with the internal service consumers. This does not apply to the external service consumer. There are service consumer satisfaction surveys, and there is indirect contact, through the Dutch Automobile Association (in Dutch: ANWB). However, the RDW makes the line of reasoning concerning public value on behalf of citizens. The underlying idea is that if a change in service delivery or the operations of the network does not provide added value for the external service consumer, that actor would not change behaviour, and thus the change would not sort effect. If that happens, the RDW tries to improve their understanding of the situation and the motivation of the service consumer. Technological innovations also provide another hurdle: the RDW may not deploy market activities. A question in this network is when innovations in public service delivery by government parties enter the domain of commercial parties and could be considered unfair competition.

5.2.5.7 Central data registry and interoperability

The RDW holds the basic vehicle registry and offers functionality – based on this registry – to other organisations in the network, which enables those organisations to perform activities on behalf of the RDW, or use the registry to assist them in their own (legal) tasks (e.g. law enforcement). The RDW offers web applications to car dealerships and garages. These actors can log in based on the RDW accreditation. For organisations in the vehicle industry, it is hard to avoid contact with the RDW. The notifications on APK inspections have to be filed electronically, whereas the registration of ownership can – theoretically – also be done at the post offices. For exchanging vehicle ownership between private individuals, the post offices are currently the channel of choice.

Direct interactions on APK have been possible since 1985, first via telephone, then videotex, and now via Internet. APK inspectors each have their own smartcard and use that for login. The RDW thus registers who inspected which car, and when. The

training of APK inspectors and the RDWs own APK (spot check) inspectors are done in collaboration between the RDW and the vehicle industry.

As discussed above, maintenance to the central registry impacts the operations of other organisations in the network. The timeslot for maintenance is therefore limited and restricted to the weekends (when most businesses in the industry are closed). The information exchange between organisations is based on XML. However, the RDW has an old mainframe. Therefore, the XML messages are converted to other protocols in the gateway. Due to the conversion, the RDW can handle different messages. According to an interviewee, the system is therefore flexible on the outside and stable in the back office.

The RDW has a dedicated IT department, thus IT is not outsourced. The department supports the business of the RDW and is driven by business demands. However, the in-house IT department is also part of the management team of the organisation. With such a governance mechanisms (see e.g. Weill & Ross, 2004), the organisation aims to keep business and IT aligned. Furthermore, one interviewee indicated that the stability of the policy domain also created the situation in which the legacy in the back office could be resolved.

5.2.6 The interwovenness of the coordination mechanisms

In this section, we have discussed the coordination mechanisms that are used to manage the interdependencies in the public-private network delivering services on vehicle administration. Interesting in this case is that the coordination mechanisms cover the breadth of interdependencies and coordination challenges we have identified in the first case study. First of all, the basic registry is the most important point of exchange in the network and is therefore a coordination mechanism for the data interdependencies in the network. However, this mechanism is accompanied by coordination on other layers; a network administrative organisation, a strong focus on collaboration and mutuality, technical interoperability, SLAs, accreditation, applications, agreements, the allocation of roles and responsibilities, formal procedures, and the other components discussed in this section.

The coordination mechanisms are all interwoven. By using a broad view on coordination, we can unravel the coordination mechanisms and thereby see that all these elements are part of coordinating the network. The ‘interwovenness’ makes it hard to discuss or assess parts of the coordination in isolation. For example, the RDW needs to be a reliable party for the other actors in the network. This is achieved by a combination of consultations, clear communication, interoperable systems, availability, temporary provisions in case of maintenance and other elements of coordination. A focus on only one of these does not respect the complexity of the coordination challenge and mechanisms in the real-life situation.

Another example of the interwovenness is found in that every goal and value has to be reasoned throughout the entire coordination arrangement; in the Netherlands, the minister is held accountable by parliament, and as the RDW has a legal task to fulfil, this accountability extends to the RDW. In turn, the RDW uses the private sector to provide services to citizens. The accreditation and the enforcement, governance and control structure surrounding it (e.g. spot checks) are means to enable public accountability throughout the chain.

Coordination mechanisms cross multiple layers. Meetings, consultations and interactions are found on all levels of the organisation, from the highest level of management to the operational level. Also continuity, which is a key goal of the organisation, is translated into coordination on multiple layers; on the one hand it is about being a reliable government, which other actors in the network can entrust the coordination of the network, but also requires good measures and escalation procedures in case something goes wrong, it is about good communication, well planned maintenance, trust, taking the interests of partners into account, proper temporary provisions, and service level agreements. The layered approach shows that coordination between organisations involves all these layers. The coordination is not just vertical within the organisation and horizontal between organisations, but also on all the vertical layers between the organisations. Thus, there is a combination of the forms discussed in the wrap-up of the interview series (§ 5.1.4).

When looking back at chapter three (§ 3.3), the main form of interdependence found in this case is consistent with the idea of sequential interdependence with predictable process flows. Consistent with the work of Grahame F. Thompson (2003) on networks, cooperation and consensus is a main coordination approach. The formal role of the RDW does enable the organisation to rely on authority in the network, a mode of coordination associated with hierarchy. However, the interviewees agree that the RDW has earned its role as network administrator by its cooperative stance, instead of (just) relying on its formal authority. As the quote on top of this chapter indicates, too much authoritative steering does not help collaboration; the role that the RDW plays is supported by the other actors and stakeholders in the network, which is an important reason for a well-functioning network, all the interviewees say. According to James D. Thompson's (1967) organisational view, the main coordination mode is that of coordination by plan, as the situation is stable, with predictable process steps. The stable situation is related to the environment as well, respondents say. Finally, the importance of the informal aspect, as (e.g.) Chisholm (1989) stresses, is also found in the case.

5.3 Findings and conclusions

In this chapter, we studied how interdependencies in a public-private service network are coordinated. First in a series of interviews with experts and practitioners and

second in the RDW case study on an operational public-private service network. We used the results from the previous chapters in our approach to the interview series and the case study. Chapter four yielded a variety of interdependent elements. Using a multi-layer view, we are able to assess the coordination challenge the interdependencies in public-private service networks bring. In the second stage in the empirical research, discussed in this chapter, our understanding of how networks deal with that coordination challenge is gained by conceptually splitting up the material and addressing it at multiple levels.

From the interview series and the case study we conclude that the use of multiple levels enables us to conceptually unravel the coordination arrangement that networks – and the organisations within it – use. In the interview series, we have seen that specific forms of coordination with a focus on one level can be used to deal with coordination challenges at other levels that are harder to deal with, such as political difficulties. Furthermore, we have seen that goals and values of stakeholders in the network, such as accountability and continuity, are represented on multiple layers of coordination, of which all are needed to realise the goal or value. This is not just the case within organisations, but throughout the entire network.

When corroborating the findings from the series of interviews with the lessons from the RDW case, we find that they affirm each other. We therefore discuss the general lessons of both in turn.

5.3.1 General findings in the interview series

A key lesson from the interview series is that the coordination challenges in public-private service networks require collaboration, both within and between organisations. Organisations, especially if they are from the private sector, are in various degrees autonomous, and departments within many public organisations also have fairly high degrees of autonomy. Market-style coordination mechanisms such as contracts and hierarchy-type coordination mechanisms such as authority both play a role, but cooperation is key.

The actual coordination arrangement needs a clear allocation of roles and responsibilities in the network. Part of that coordination arrangement should be a mechanism that monitors and enforces compliance with the coordination mechanism. Still, as authority is not always a viable strategy in networks, the allocation of the main coordination roles needs to be done in mutual agreement. The various actors in the network, and their stakeholders, need to collaborate within the network in order to make it work.

In the interviews, we have also seen that the organisational setting and socio-political environment of the actors can vary, which impacts the applicability of certain coordination approaches. In one situation, there is more room for an authoritative

approach, even though it also relies on a mind-set of collaboration. In another situation, the dealing with the interdependence at an organisational and political level increased the potential for conflict, which was less when focusing the coordination on the layer of sharing data in the network. In complex networks, a dedicated coordination entity (e.g. a separate and designated network administrative organisation) can steer the coordination in the network and help to focus on collaboration whilst preserving the autonomy of the organisations involved. Still, in almost every situation, the government parties need to retain some control over the role that private parties play in public service delivery, as the latter have different values and as such, the government needs to warrant public values, for example that public services are actually realised. Consequently, the relationships between actors in public-private service networks are not at a peer level, but resemble principal-agent relationships, which was also found in the theoretical background in chapter three.

Apart from the interdependencies between actors, there are also lessons on the interdependencies within organisations. Many organisations and multi-organisational arrangements focus on improving service delivery by improving the front office, closest to the service consumer. However, the back office needs to be improved as well. Otherwise, the back offices in the network may become the bottleneck in a later stage. Ultimately, integrated service delivery relies on interoperable back offices as well. Many organisations need to reorganise their back offices to enable this. Furthermore, to be able to adapt to new developments, such as new service delivery channels, the service delivery channels should be independent from the content, which should be coupled and synchronized to be useable by every department in every organisation in the network that needs it.

Finally, data plays an important role in networks. A shared and up-to-date data registry is essential to coordinate the information interdependencies in a network of service providers. Public-private service networks do pose a number of challenges to the arrangement of such a shared information basis. A shared registry is an important element of the coordination in networks as it also introduces a way to coordinate networks through the ownership and control over the distribution of data (as opposed to management at an organisational level). In most situations, shared data requires coordination arrangements at other levels, such as we have seen in the RDW case, in which a complete structure of authorisations, monitoring, sanctions, agreements and spot checks is required to maintain an well performing shared information basis for the network.

5.3.2 Findings in the RDW case

In the RDW case, the process steps and the sequence of the activities are to a large extent predictable. This has much to do with the nature of the services and the way

these are coordinated in the network, although the interviewees also indicate that the policy area of the network is stable compared to the situation some other large government agencies are in. The arrangement of coordination mechanisms covers the coordination challenge that rises from the service delivery process execution by the network. In the interviews series, is was found that in more turbulent situations and policy domains, more differentiated coordination forms are found, often focused on one level only.

A characteristic of the RDW network is that the activities are allocated to actors that already offer their business to the consumer of the public services. By integrating these services, the service consumer process is better facilitated by the joint service consumers. As this is a general principle, driven by the aim to improve service delivery at lower costs, the RDW does not always provide their services directly to service consumers, but links up to the activities of other organisations, even if they are in the private sector, as is the case in the network described in the case study. As a result, the RDW plays a central role in networks surrounding data and services related to vehicles in The Netherlands. The other organisations in the network sometimes have varying interest, which requires consultation and a collaborative stance in the network. A well-arranged and stable core of the network creates the space necessary to improve the operations (e.g. service delivery) of the network.

The actors involved in the network deem its operations successful. Important to this success are the relationships between the various parties that play a role in the network. This requires that the network coordinator is perceptive to what is important for the other actors in the network, it requires professionalism, sticking to the agreements made, and acknowledging the interests and competencies of other parties, which includes that the network coordinator respects the (IT) capabilities of the other organisations. If things go wrong, well-arranged escalation procedures need to be in place. Due to the collaborative nature, it is important to keep all stakeholders on board.

Concerning the coordination of the network, the coordination arrangement in the RDW case is focused on realising continuity in the operations of the network. This way, the RDW performs its role in the network, and other parties trust the organisation. For the actors in the network, it is important to be connected to the RDW. The law allows the RDW to prescribe how they have to connection. For companies in the vehicle industry, there is almost no getting around the RDW. However, a connection with the RDW is not permissive. An important coordination tool of the RDW is its accreditation of companies. This accreditation is a formal arrangement, but is perceived as a mark of quality. This is strengthened by procedures of monitoring companies and individual APK inspectors. For cases in which the arrangements and terms of the authorisation are violated, a system of

sanctioning is in place. The BOVAG supports this approach and the RDW consults such industry interests groups often, especially in early stages of changes. There are multiple levels of communication. This is not always focused on consultation, but sometimes on explanation. Furthermore, the ministry, which is an important stakeholder, is also involved. Public servants at the ministry sometimes have a different agenda, which may limit the room for changes in the network, and requires mutual understanding and consultation. ICT is an important driver and enabler for change. However, the RDW argues it only takes on what it can handle, as continuity and control of the network are most important ('cobbler, stick to your last'). In this network, the RDW fulfils the role of the principal, as it is the network coordinator, based on the following key components:

- Role as coordinator entrusted and supported by other parties in the network;
- Central data registry based on information stewardship principle;
- Image and identity of a reliable partner that sticks to agreements;
- Open attitude and clear communication of changes, also in the early stages of a change process.

The other networks the RDW is in, the RDWs role of information steward is more important (e.g. to other government organisations) instead of principal-agent relationships.

5.3.3 Conclusions on coordination of public-private service delivery

As a result of answering research questions one and two in the previous chapter, we know which interdependent elements in public-private service networks exist and which coordination challenge they result in. The third research question pertains to the mechanisms that are or can be employed to deal with this coordination challenge and is answered in this chapter.

We found a number of strategies for dealing with interdependencies at the political/socio-organisational level:

- A collaborative approach;
- An authoritative approach;
- Reduction or avoidance of potential conflict.

In the interview series, we found a generic coordination mechanism for each of those strategies:

- A network administrative organisation for the collaborative approach;
- An orchestrator for the authoritative approach; and
- An information broker to avoid conflict at the political or socio-organisational level.

Whereas all approaches to dealing with the interdependencies between actors in public-private service networks rely on mechanisms such as mutual adjustment, trust, contracts and agreements, all of these become more important in the collaborative setting, as the interdependencies cannot be managed authoritatively. That said, we also learned that the distinction between a collaborative approach and an authoritative approach could not always be drawn sharply. A number of interviewees in the interview series and in the RDW case indicated that even in a situation in which an actor has some formal authority, a focus on collaboration and mutual understanding works better.

These generic coordination mechanisms can be translated in operational roles and responsibilities. An example is accountability, if that does not flow from hierarchy it needs to be clearly allocated as part of the responsibilities of each actor. Furthermore, we found that a network administrative organisation can appoint a local administrator at other organisations in the network; as a result, at the boundaries of the organisations, the responsibilities of the network administrator are transferred to the local administrator and thus clearly allocated.

In the first case study and in the answer to research question two, we already found that cross-organisational service delivery is not developed in a green field situation. Organisations have existing tasks, processes, ways of working, systems and data, and an organisational structure that accommodates those existing parts. The interdependencies in this organisational structure pose a coordination challenge when improving service delivery. In the interview series, we found two approaches to integrating service delivery: a front office first approach, and a back-office first approach. The front-office first approach is expected to lead to quick wins in service delivery towards service consumers; efforts are visible quickly and services can be integrated across service delivery channels, or the services of multiple organisations can be joined-up, creating a one-stop-shop (access to multiple services, of multiple organisations, in one place). Ultimately, the underlying issues in the back office (e.g. fragmented information systems, data not being shared) are not solved and in time, these issues need to be taken care of as well. As a consequence, the front office approach sometimes employs makeshift measures to deal with fragmented and legacy back office systems.

In the back office approach, a more fundamental redesign of business processes, or even of the business network is in order. Systems that provide duplicate functionality or store the same data need to be integrated, business processes need to be facilitated across the boundaries between departments or organisations, interactions need to be standardised, and data shared. Integrated service delivery can be realised by acquiring data from the parties in the network. In that case, organisations do not necessarily join-up services, but the organisations in the network collect data and

information from the network. The service network then coordinates the interdependencies. The difficulty with a back office approach is that you have to do it right as undirected efforts may in the future provide hurdles to improvement, much like the automation of a fragmented situation now poses barriers to service integration. The quote of Peter Senge, over chapter one, also illustrates this: “today’s problems come from yesterday’s solutions”.

This sharing of information between parties in the network, for example because the services of one organisation can be improved by gathering data from other organisations, can be seen as a federated approach to shared information. However, all or most parties in the network use similar pieces of information or data. For this, a shared data registry is an important coordination mechanism. Qualified parties in the network can use such a centralised source of data. ICT can play an important role in improving service delivery; data can be exchanged electronically and be processed electronically, ideally resulting in less work for the service consumer, in faster handling, and in a reduction of errors. In some cases, the network is actually coordinated at the data level, as the lead organisation is the information broker in the network. Although it has no or little control over the front office or over the organisations in the network, it has over the information in the network.

As many networks still have to deal with fragmented systems and data, and the parties in the network use different technologies, standards, and terms, networks sometimes choose a short-term solution, such as the front office approach discussed above, or setting up a so called mid office (see § 5.1.3) or other mechanisms to fill the white spots, deal with unstandardized data semantic ambiguities, or deal with information systems that are not interoperable. Future developments need to tackle these issues as the weakest link in a network determines the quality and extend of integrated service delivery.

The two research steps discussed in this chapter support our proposition from theory that a single-level coordination lens is insufficient. Theoretical concepts such as consensus and trust are not enough to describe how a network is coordinated. Cross-organisational service delivery processes, data sharing, certification, checks and enforcement are all part of the coordination mechanism, as are trust and mutuality. Neither high-level coordination concepts, nor process orchestration, nor the technical interoperability are by themselves sufficient to coordinate public-private service networks.

In the next chapter, we structure the findings of this and the previous chapter, combined with the theoretical background, in a framework for unravelling interdependence and assessing coordination in public-private service networks.

6 Unravelling interdependence: a coordination framework

"[…] nothing in the universe exists as an isolated or independent entity"

- Margaret J. Wheatley -

In this study we focused on integrated service delivery by networks of public and private organisations. To integrate services across organisational boundaries, actors have to work together. Despite the arguments made in practice and literature in favour of collaborative public-private service delivery, literature does not specify how the many and complex interdependencies in such service delivery arrangements have to be dealt with. In other words: it is unclear what needs to be coordinated in public-private service networks, and how, in order to realise joint service delivery. As this research aims to address that gap, we have defined a coordination lens in chapter three, which we used to look at public-private service networks in empirical cases and to identify coordination challenges on the three layers we used to describe and analyse coordination in these networks. In this chapter we propose a framework for the assessment of coordination in public-private service networks by extending the three layers. This chapter aggregates our research findings, with reference to the theoretical background. As such, it fills the gap between the developments towards public-private service networks and the lack of suitable literature available to understand the coordination needs that such networks have.

The coordination lens we use in our study entails that we view these networks as systems of interdependent elements, as the elements in the network have to work with one another in order to fulfil the tasks of the network (in this case: to provide services). The interdependencies between the elements in a system, (whether a political system, a system of organisations, an information system, or all of these combined) pose a challenge of dealing with these interdependencies in order to achieve concerted action (in this study: integrated service delivery). Dealing with the interdependencies in order to realise concerted action is called coordination. Ways to achieve coordination are called coordination mechanisms or strategies. Apart from just making the interdependent elements work together, these mechanisms also have to overcome the coordination challenges we found in the first case study. To clarify this by an example: an authoritative approach can be a way deal with interdependencies between organisations, but if the organisations involved are autonomous, dealing with this autonomy is a coordination challenge that an authoritative approach is less good at addressing, compared to for example a collaborative approach.

The study of coordination in public-private service networks resembles the notion of 'wicked' problems (see § 2.1). Wicked problems are often ill defined and include many stakeholders (with different views and interests). Therefore, such problems do not have a best or definitive solution. To deal with the nature of wicked problems, we have focused on understanding coordination in public-private service networks by seeking to understand the phenomenon in its substantive and complex real setting. We have used the three layers to structure our assessment of the cases and the interview series. Note that within these layers much complexity exists and that therefore these layers are not meant to be exhaustive or complete. The multi-layered structure serves our research goal of understanding interdependence and coordination in public-private service networks by serving three purposes:

- Unravelling the interdependence in public-private service networks;
- Identify coordination challenges in these networks; and,
- Assessing the coordination of these networks.

In a case study of a public-private service network in The Netherlands and by conducting a series of semi-structured interviews, we learned that a multi-layer view on coordination enables us to unravel the coordination challenge in public-private service networks and to assess the coordination mechanisms. Furthermore, we found that these layers are also themselves interdependent; coordination on one layer might be influenced by coordination challenges at another layer. In this chapter we propose a framework for the assessment of coordination in public-private service networks, based on our findings and with reference to the theoretical background. The layers of the framework are then discussed in more detail. Finally, we provide more generic directions for the coordination of public-private service networks in practice. Parts of this chapter have been published in (Klievink, Derks, et al., 2008; Klievink & Janssen, 2009b, 2010a).

6.1 Public-private service delivery: towards the framework

The starting point of this research is the drive towards integrated public service delivery that crosses the boundaries of public and private organisations. In theory and practice, we have seen that governments put effort in developing concepts like demand-driven, integrated, joined-up, single window, and one-stop-shops. The move towards cross-organisational integrated service delivery by public and private partners can be described in terms of a decoupling point between two different types of processes: 1) the set of processes that (individual) service providers perform for a specific service and 2) the process that the service consumer goes through. At some point, these two processes meet. This point is when a service consumer identifies and requests a service or when a service provider identifies that a citizen or business is required to take action (e.g. taxes). We call this point the decoupling point between

the service providers and service consumers, a term used often in logistic supply chain literature (e.g. Christopher & Towill, 2000). The more services are integrated by the service providers, the more the decoupling point shifts in favour of the service consumer, as the service consumer does not have to contact multiple departments or organisations independently for different parts of a service. Offering services in an integrated manner entails that the burden of coordinating the different steps that make up a service delivery process is put on the joint service providers. As the service consumer is no longer the linking pin between parts of the service, the interdependencies that exist between the service providers, the steps in the process, and the information systems and data have to be coordinated by the network of service providers. In this sub section we describe a shift in this service provider/consumer decoupling point, based on the developments of Dutch government organisations as discussed with participants of the project in which the first case study took place. The overall direction of the development from fragmented to integrated service delivery in The Netherlands was validated by public servants and has been published (Klievink & Janssen, 2009b).

6.1.1 From fragmented to integrated service delivery

The explorative study we discussed in chapter four started due to the realisation by large government organisations that the processes of service consumers are broader than the individual service request they make towards a government organisation. Furthermore, such service consumer processes often include service requests for multiple government organisations. Especially in the situation of very fragmented organisations, a process that a service consumer goes through may even include multiple departments within the same organisation that the service consumer has to contact individually. In this fragmented situation, the service consumer is the main orchestrator of all the services that he or she requires. The background of this fragmented situation of functional siloes, separate systems and autonomous departments is described in chapters one and three.

In this situation, service consumers are expected to find their way around this maze of government services. To begin with, they need to determine which services they require, and then they have to identify the organisation or department that provides the service in question and contact that organisation or department. Because each organisation or department uses its own isolated applications, service consumers often have to provide the same information over and over again.

E-government efforts, as described in § 3.1.3, focus on transcending this phase. Many government organisations have moved (or are moving) towards an integrated or joined-up organisation that copes with – or at least hides from the service consumer's view – the fragmented internal structure of the organisation. This does not just apply to the electronic channel as organisations adopt multi-channel strategies to provide

service consumers with joined-up service delivery in the channel of their choice (e.g. Ebbers, Pieterson, & Noordman, 2008). Such a multi-channel approach requires an integrated front office. Other important strategies include a focus on the integration or transformation of back offices, which has been the focus of various projects (e.g. Codagnone & Wimmer, 2007; Undheim & Blakemore, 2007) and establishing shared service centres in government (e.g. Janssen & Joha, 2006).

Integrating the processes and applications of various departments within an organisation reduces the burden for the service consumer of orchestrating the service providers, as the service consumer no longer has to deal with separate departments. Furthermore, integration may improve efficiency from an organisational point of view, for example by sharing data and infrastructural facilities. Therefore, services should be integrated, at least within organisations. Since many departments have a certain degree of autonomy, this also requires an overarching customer strategy and IT architecture. The service consumer then does not contact the individual departments within an organisation individually, but contacts the organisation as a whole, reducing the orchestration burden for the service consumer.

These two forms are illustrated in **Figure 8**. On the left, the situation is displayed in which a service consumer has to contact every individual department, whereas the right displays integration – or at least joining-up – at the organisational level.

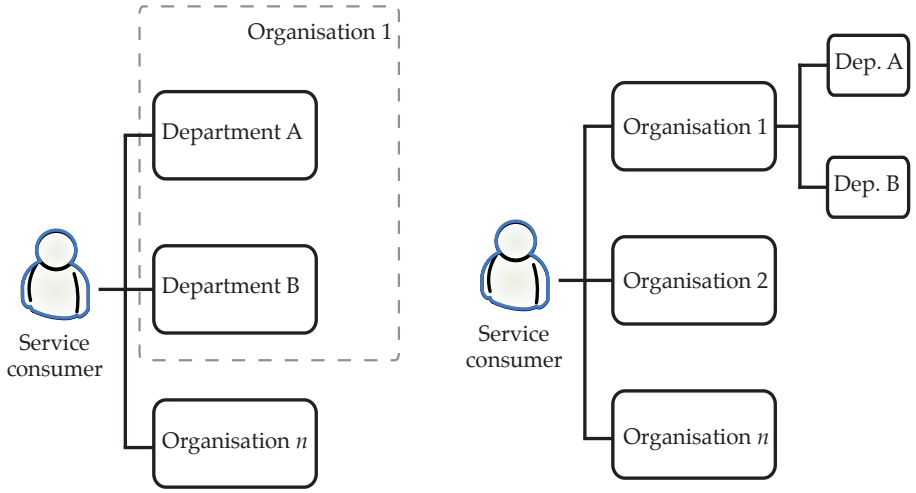

Figure 8: **fragmented service delivery (left) and organisational integration (right)**

Many organisations intend to adopt a service-oriented architecture (SOA) approach, which helps them interconnect the previously stove-piped applications. Although many organisations involved in the first explorative case study are still in the (early) transition stage, implementing a service-oriented way of thinking in organisational structures and applications helps to ready organisations and technologies for future developments. Organisations can present themselves as a single organisation, with an integrated (web) portal, such as the portal that is the subject of the first case study. Organisations can thus – in their efforts to improve the functioning of the organisation itself – prepare to collaborate in public-private service networks.

A joint portal for service delivery can take various forms. The demand-driven, integrated portal in chapter four is a very complex form. The portal was partially based on the development of a government-wide online presence in The Netherlands: My Government (MijnOverheid, in Dutch, a project formerly called PIP; Personalised Internet Page). This web presence aims to mediate electronic interactions between citizens and government agencies (for businesses other initiatives exist), and to allow service consumers access to multiple government organisations through a single web portal. The underlying idea is that agencies provide their transaction services using this facility and are given access to the relevant information, relieving citizens from having to supply the same information over and over again. The use of this infrastructural facility is expected to have an impact on the architecture of many government organisations. To further the development of e-government in the Netherlands, a number of basic infrastructural facilities have been developed or are under development. A nation-wide authentication and identification facility, called DigiD, and a facility designed to generate online forms, called e-forms, have already been developed and are used by an increasing number of government organisations. These facilities can be shared and used by other organisations to collaborate in the joint web presence.

From the perspective of a shifting decoupling point in cross-organisational service delivery processes, these developments can facilitate the sharing of (case) information between government agencies. Also, from the perspective of the service consumer, this creates a one-stop-shop as it provides an overview of all his or her interactions with multiple government organisations.

The interactions with government agencies are more user-friendly in the one-stop-shop as the service consumer can identify and contact government agencies using one portal. However, there are different forms a portal can take. In the simplest form, it is just a single point of contact (e.g. a website) in which the service consumer is still responsible for identifying the services (a task made easier by a shared portal) and for interacting with the individual organisations themselves. The decoupling point is not really shifted in this development. As the service delivery processes do not stop at

organisational boundaries, a network of organisations that aims to deliver integrated services has to shift the decoupling point to take over the orchestration task from the service consumer.

6.1.2 Shifting decoupling point: coordination by the service providers

The coordination challenges for integrated service delivery arise when pushing the decoupling point as far towards the demand-side, i.e. the service consumer process, as possible. This means that the burden of orchestrating the service components into one piece of service delivery is the responsibility of the service providers. The information and services are presented and structured in such a way that the service consumer does not need to know or deal with the fragmentation of the network of service providers (Wimmer, 2002a). This goes beyond a simple shared website. In our research we found two basic forms of such a portal.

One is to offer a portal and to integrate the services by coordinating among the service providers. This entails that the organisations involved in a service-delivery chain need to work together for their operations. On the one hand, this implies that there has to be a will to work together and to jointly orchestrate the chain, while on the other hand requiring the creation of standards regarding things like data exchange, terminology and technologies. Fully integrated service delivery means that service consumers file their service request at the start of the chain, after which the various organisations work together to provide the service in question. The last organisation in the cross-organisational process flow finalises the service delivery. This form is applicable in the social support scenario of the first case study, as the predictable and sequential process flow enables service providers to assess which organisations are involved, which service components have to be provided, and in which order to stepwise deliver the service requested. In other words: due to the predictability, the process flow can be specified in advance and orchestrated as a process.

The other form of shifting the decoupling point towards demand-driven, integrated service delivery is found in the work re-integration scenario of the first case study. The cross-organisation process flow in that scenario has a reciprocal character and is less predictable than in the social support scenario. To facilitate such processes, all organisations in the network have to be connected and the interfaces between the organisations have to be able to accommodate a wide variety of service process flows. Furthermore, this requires a mechanism to identify which components are necessary to realise the requested service and an overview of the entire service delivery flow in the network. In the case study in chapter four, much of these service orchestration tasks are put in the portal. The major coordination load is in the interfaces among the service providers and between the service providers and the service consumer (in the case via the portal). In other words: the service consumer is no longer the spider in the web that orchestrates all branches in the network, but the service providers have

to spin and orchestrate the web in such a way that it is able to deliver integrated services based on service consumer demand. As the process flow of service delivery processes for individual service consumers may vary and is not always fully predictable, the process flows cannot be fully specified in advance, which means that more is at the discretion of public servants included in the service delivery, or that the coordination has to be focused on the interfaces between the actors. These two variations on integrated service delivery are visualised in Figure 9.

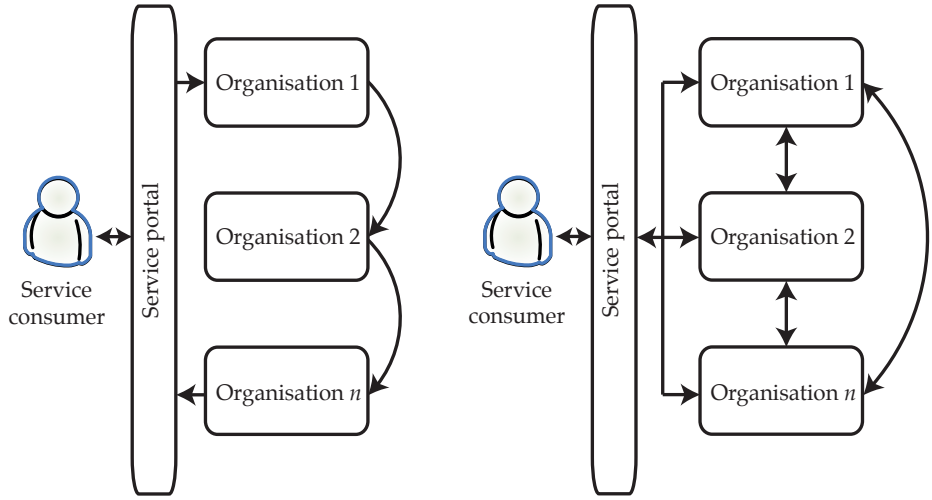

Figure 9: **service chain coordination (left) and service network coordination (right)**

The more the decoupling point is shifted in favour of the service consumer, the more inclusive the network of service providers is and the broader the service consumer process that is covered by the network. The service delivery is integrated by the network of service providers, relieving the service consumer of the burden of orchestrating the overall service delivery process. As, from a service consumer perspective, many processes also cross the boundaries between the public and the private sector, a shift in the decoupling point also entails a role for the private sector in facilitating the overall service process of the service consumer. The more is thought from the perspective of the service consumer process, the broader the service process is, the bigger and more complex the network of service providers is, and the more the burden of dealing with the coordination falls on these joint service providers.

6.1.3 Forms of service integration in public-private service networks

Theory provides different terms for the idea of improving service delivery by shifting the decoupling point in favour of the service consumer; joining-up, one-stop-shop, integrated service delivery and single window. Based on the research and the discussion of the decoupling point, we can further specify the forms that integrated service delivery in public-private service networks can take:

- *Joined-up service delivery*; services from both the public and the private sector are bundled in one place and offered in a consistent manner. The added value of joining-up may differ. For example, in the first case study, we have seen a demand-driven portal in which public and private organisations join-up their services in order to create a continuum of care. The general idea is to create a *one-stop-shop* (a single point of access) for related services; service consumers can deal with multiple service providers in one (electronic or physical) place. From the various strategies we found in the interview series in chapter five, this could be regarded as a front office strategy in which the first priority is to offer the services in an integrated manner, even if this means that (temporarily) additional steps are required to realise it. However, this also requires common e-government building blocks and that organisations are interconnected;
- *Integrated service delivery*; whereas integrated service delivery is an umbrella term for the concept of organisations collaboratively offering services, we here mean that services are not just offered together but are in fact integrated. Whereas joined-up service delivery can for example take the form of a single website with components of multiple organisations, integrated service delivery means that a service request is filed one time in one place, and an integrated response is given. In terms of public-private service delivery, private parties can – for example – provide data to public organisations in order to enable that organisation to provide integrated service delivery, thus relieving the service consumer of the task of acquiring this information at the private party first and then providing it to the government organisation. For example, the Tax and Customs Administration increasingly gathers information from private parties (e.g. employers, banks) and uses that information to partially fill in the electronic taxation form for citizens. This information can also be used in the domain of law and compliance enforcement, as the organisation has access to the original data. Furthermore, it can also be a strategy to improve the efficiency of an organisation, as electronic data provisioning on a large scale is more efficient than having individual service consumers contact the organisation through multiple channels (e.g. website, telephone). Compared to a one-stop-shop idea, this form resembles a *single window* (although conceptually this does

not differ much from the one-stop-shop concept), as – for a set of interrelated services – there is one place to interact with. Of the strategies encountered in chapter five, this primarily relies on a back office approach, as it strongly relies on the exchange of data and all issues related to that;

- *Intermediation*; apart from playing a role in the back office, private parties can also be part of the service delivery structure, for example by serving as a service delivery channel as is the case in the RDW case. Literature suggests that intermediaries can play several roles and add value, such as aggregating information, facilitating a process or service, or acting as a trusted party (see e.g. Janssen & Klievink, 2009). Private parties can offer government services together with their own products and services and thus act as a place of contact. Furthermore, they can also offer government services to service consumers that also require services from the private party, or integrate government services in their own products or services. An example of the latter is a financial consultant that also files taxes based on the information he or she administers for the service consumer. Theoretically, government can integrate services in private sector products and services so the service consumer no longer has to contact the government organisations at all for those services, but deals with his or her obligations towards government through private sector service offerings.

6.2 A framework for coordinating public-private service networks

The drive towards integrating service delivery across the boundaries of information systems and organisations provides the rationale for organisations to collaborate, also across the boundaries between the public and the private sector. Integrated service delivery requires actors to interact and collaborate, which introduces interdependencies. In chapter three, we have defined interdependence as the extent in which the elements in the system (the public-private service network) have to work together in order to make the network function, thus in order to realise integrated service delivery by the network. However, making the elements work together is a complex undertaking; it leads to coordination challenges. In order to be able to shift the decoupling point in favour of the service consumer, and thus to improve service delivery, these coordination challenges have to be dealt with in the coordination mechanisms that public-private service networks use to realise concerted action. For this, we need to know what needs to be coordinated, and how, which was the question we started this research with. Coordination theory primarily looks at the level of activities in processes, which is insufficient to assess the complex organisational and technical challenges that play a role in the coordination of public-private service networks.

A public-private service network has a structural component to it, as it comes with long-term, repetitive exchanges between the actors involved. Furthermore, for every cross-organisational service delivery process (could be thousands a day), the network has to deliver. A focus just on steps in a process is not enough as it does not respect the socio-organisational situation, and the focus on that situation through contracts and agreements foregoes on the operational nature of the network, in which a wide variety of (legacy) information systems have to be interconnected, data has to be shared, and process steps have to be aligned seamlessly.

We used a three-layered view of interdependent elements. Furthermore, we identified a number of coordination challenges that arise when dealing with the interdependencies between these elements. These coordination challenges are related to dealing with the interdependencies between actors, steps in a process, systems, and other interdependent elements in a public-private service network. The case studies confirmed that coordination theory with narrow or high-level views is insufficient to assess coordination in public-private service networks, as in practice it covers a wide range of coordination challenges, from dealing with the autonomy of partners in a network to the standardisation of IT for exchanging data and everything in between. As such, the multi-layer view enables us to see coordination challenges beyond individual levels. The multi-layer view shows the layers on which coordination challenges are found and also illustrates that those layers are interrelated themselves. This interwovenness was especially clear in the RDW case study, in which – together with the interview series – we found a variety of coordination mechanisms to deal with the interdependencies and address the coordination challenges. What is more, we even found that some networks focus coordination on a specific layer of interdependence in order to deal with surmountable coordination challenges and to thereby deliberately avoid dealing with interdependencies that were more difficult to deal with.

We assessed the coordination challenges and the mechanisms that networks employ to deal with them on three levels that we identified in chapter one: the organisational setting in the service network, the cross-organisational service delivery process, and the use of information systems and data in the network. By using these multiple layers, we aimed to understand the coordination challenge and mechanisms in public-private service networks better than we could have by using coordination lenses that focus on individual levels. We used the layers to actively seek the complexity of the coordination challenge in chapter four and to unravel the mechanisms used to coordinate these challenges in chapter five. The findings from these chapters, together with the lessons from the literature review provide the foundations for the framework discussed here.

6.2.1 Integrated services: interdependence beyond the process level

In our descriptions of the shifting decoupling point above and on literature about public service delivery, developments in public service delivery follow a stage-wise progression. Especially in electronic government literature, stage models are a popular way of describing the e-government challenges, initiatives and developments. These models provide a good description of how government organisations are moving from non-electronic service delivery, a situation marked by the organisational fragmentation, towards electronic service delivery. First, organisations offered information through websites, but now also offer transactional features, which often transcend departmental and organisational boundaries. Most models are conceptual only and limit their focus on individual organisations. Therefore, in this study, we have described the next step: from integration within organisations towards service delivery that transcends the organisational level. This chapter describes the shift of the service provider/consumer decoupling point from supply-driven service delivery towards demand-driven service delivery, in which the service consumer process is facilitated by a network of service providers, instead of that the service consumer has to orchestrate the various process steps involved in his or her process. The ideal result is that the number and complexity of the activities that a service consumer has to perform in a service delivery process is minimised.

In our description of the stage models, the decoupling point, and coordination theory, we have seen that integrated service delivery is often looked at from a process perspective. This was also the case in the first case study; the initial focus was on how a cross-organisational process could be realised. In the theoretical background of coordination (in § 3.3.1) we have described that a distinction can be made between *types* of interdependence and *forms* of interdependence.

Types are about the relationship between activities and resources. In the two models of integrated service delivery discussed in § 6.1.2 (Figure 9), we have described that the first model features a more predictable process flow than the other. As the various activities in a cross-organisational service delivery process have a process flow in which one activity precedes the next and the cross-organisational process is characterised by flow type of dependence. The other model, that of joined-up service delivery through a portal, may offer more variety and the ultimate service delivery process that results from service requests in the portal are less static and thus less predictable. A fit is required between the activities that each individual service provider contributes to the overall service. Note that there is not a strict separation between these two types of dependency, both types can occur in the same service delivery process, but the primary type in a process may vary as described above. The third main type of dependency – the sharing dependency – is also found in most information-intensive organisations and networks.

Forms of interdependency are about the technically necessary relationships between parts that together make up a business process. When looking at the two scenarios in the explorative case (chapter four), there is a large difference between the two scenarios. The interdependencies in the social support scenario have a sequential form and the same applies to (e.g.) the vehicle ownership registration process in § 5.2, whereas the work re-integration scenario has a less predictable process flow. This difference has an impact on the coordination mechanisms that can be applied in the portal. Stable situations can primarily rely on coordination by plan, while less predictable flows rely more on coordination by feedback or mutual adjustment (March & Simon, 1958; J. D. Thompson, 1967). Although these theories focus on organisations, this has implications for the coordination mechanism that can be employed in networks. Mutual adjustment relies more heavily on dealing with interdependence on the level of the actors involved (e.g. decisions and communication), whereas standardisation and coordination by plan deal with the coordination challenge on the level of processes and interoperability.

The process view is often dominant in coordination theory and in literature on e-government. A cross-organisational process in a chain or network poses interdependence and complex coordination challenges. In our study, we primarily found that such processes are not always sequential and predictable, which makes it more difficult to coordinate them. However and more importantly, we also found that just focusing on the processes and the activities that make up those processes is too limited a view. In chapter four we established that the three layers of our analysis are also suitable to describe the interdependent elements in a public-private service network at a high level. Next to the process level, the organisational and technical levels also have interdependence and result in coordination challenges.

In public-private service networks, a cross-organisational process is executed by a number of organisations, from different (public and private) backgrounds, collaborating in a network. As we described in the empirical chapters, public-private service networks are a complex multi-actor problem that pose coordination challenges like the autonomy of actors and the coordination of a cross-organisational process has to accommodate such coordination challenges as well. Especially in relation to private partners, this situation impedes the applicability of some coordination mechanisms. But also within government, the hierarchy as the ideal type of the organisational structure is an oversimplification due to the variety of organisations involved and the fragmentation of those organisations. However, in public-private service networks, organisations often are autonomous to a certain extent and a hierarchical approach to coordination is not always realisable. The theoretical basic forms of coordination – collaboration and mutual agreement – are mechanisms also found in practice. Furthermore, a process in such a complex

organisational setting often relies on information systems and data, which can be fragmented or have other characteristics that result in coordination challenges.

As **Table 1** shows, coordination challenges can be found on all three layers of interdependence we used in this study. Therefore, and in line with the rest of this study, we argue that the typical process-oriented view on cross-organisational service delivery is insufficient for assessing the coordination of public-private service networks. A cross-organisational process is complicated by coordination challenges and mechanisms related to all three layers of interdependence.

6.2.2 The analytical framework of coordination

In the case studies, a multi-layer view helped us to unravel the interdependence and coordination in such a way that enabled us to see that both coordination challenges and mechanisms exist on all the layers and that they are interwoven, we propose a framework that represents the key findings (hence, to enable the unravelling of the interwovenness). The framework is based on the idea that a broad view on multiple levels enables us to unravel the interdependencies posing the coordination challenge in public-private service networks and to identify and differentiate between mechanisms for coordinating these interdependencies. As such, it is a tool to assess coordination in these networks.

It is important to note that our multi-layer approach was not intended to identify and use every possible perspective. We split up our view on coordination in public-private service networks in multiple layers to be able to differentiate. The layers we use are, for our purposes, sufficient to unravel the coordination challenge and to see the various sides of coordination in these networks. The classification is thus not exhaustive, nor do the layers include every detail. Also, the layers are not mutually exclusive; an example is the concepts of standards as discussed above: we look at standardisation as a coordination tool for interdependencies between systems, but standardisation is also a policy and organisation challenge. Furthermore, standards can come from different sources, such as policy (de jure) or practical use (de facto). Both are forms to enact standards, with their own interdependencies (including political and organisational) that can be identified from the other layers. The layers are thus interwoven, which was also illustrated in the RDW case (see § 5.2.6). However, as a conceptual tool, these layers enable us to unravel – and thus to see – this. The framework should be used to assess coordination arrangements at multiple levels and to look into the dependencies between the layers, instead of using narrower views on coordination.

Furthermore, it is important to stress that dependencies not only exists at the individual layers, but also between those layers: in a fragmented organisation, departments have a relatively large degree of autonomy and each has its own

systems. Coordinating the organisational aspects is therefore also a challenge for the interoperability of information systems, and vice versa.

In the framework (**Figure 10**), the top layer deals with the organisational setting. This layer covers the coordination challenge that is created by the organisational structure, the boundaries between the organisations and the fact that many of these organisations are – to some extent – autonomous and have certain (power) positions. In terms of coordination, this layer also covers the network governance and the relationships between the actors, which are for example based on trust or authority. This is related to the macro forms of coordination found in organisations to deal with interdependencies within the organisation and with interdependencies with other organisations. These macro forms are hierarchy, network and market, which can all be present in a public-private service network.

The cross-organisational process layer basically has two major components, which are the overall service delivery process that transcends organisational boundaries and the individual organisations' contribution to this. The way the network is coordinated impacts the roles and responsibilities of the actors that play a part in the network, which is an important way to coordinate the dependencies between the actors in a cross-organisational process flow. Such a process flow can have different forms; we found both sequential and reciprocal process flows. The form impacts the way it can be coordinated. Furthermore, such flows consist of activities of the actors involved, which can be activities that take place within an individual organisation, activities that interact with other actors, activities that are shared (or federated) among actors, and also include the activities of the service consumer. When shifting the decoupling point in favour of the service consumer, the activities of the service consumer should not include the coordination or orchestration of the other activities.

Finally, the technology layer covers the data perspective, the information systems and technology that technically support the cross-organisational service delivery. Specifically, shared data (whether in a centralised or federated setting) plays an important role. Coordination challenges include the distribution, compatibility, quality and access of these data. Furthermore, the information systems that are used in the service delivery process can be fragmented and legacy systems, which makes interoperability difficult. As the network comprises multiple different organisations, each of which can also consist of multiple actors, a complex set of information systems, technologies and data is involved, which requires interoperability and standardisation. The layers are visualised in **Figure 10**.

In brief this framework represents: the main interdependent elements in a public-private service networks, including the network of organisations, cross-organisational process flow, and information systems and data; the coordination challenges that can be encountered when dealing with this interdependence; and the fact that

interdependence exists across those layers (vertical) and between organisations (horizontal). The framework describes three general layers: the interdependent elements at a high level, and nine sub layers, which in effect represent the complexity of coordination in such networks. As such, the nine sub layers can be seen as sources of coordination challenges combined with ways to deal with them. Taken together, they represent the complexity of coordinating public-private service networks. This complexity – these layers – have to be considered in coordinating public-private service delivery. Coordination challenges and mechanisms exist on all the layers and are interwoven.

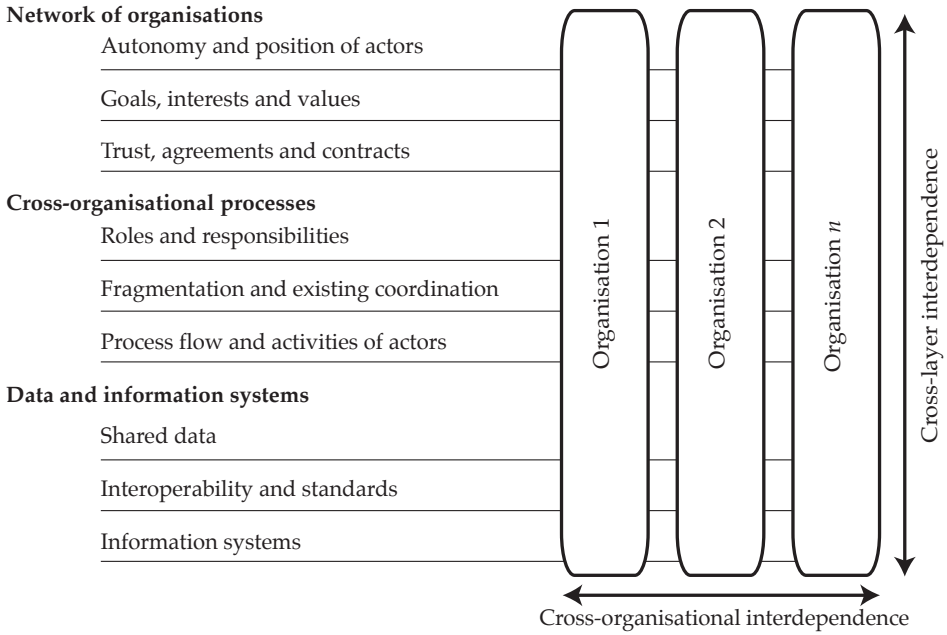

Figure 10: **analytical framework of coordination**

6.3 Layers of interdependence: the background of the framework

In this section we describe the background of the framework, for which we draw on both theory and practice, described in the previous chapters. The elements discussed here correspond with the nine sub layers of the framework. They represent the outcome of the three steps discussed above: unravelling the interdependence to identify the coordination challenges and assess the coordination. Note that the framework is based on the entire study and not just on the topics discussed in this section, although they represent the most dominant findings. Furthermore, as the layers are interwoven and a singular view does not respect the complexity of reality, the precise demarcation between the layers may vary between different situations. Therefore some of the coordination challenges and mechanisms described here may

be on the brink of another layers. This is especially the case for the barrier between process and technical aspects, for example the use of architecture to govern technological components from an organisational perspective, which we discuss on the process layer. Another example comes from activities that are part of a cross-organisational process but are primarily related to a technical building block, such as an authentication facility.

6.3.1 The organisational layer: a complex multi-actor network

In this section, we discuss the interdependence on the level of organisations. These three sub-layers of the framework can be seen as sources of the coordination challenges found in the empirical chapters of this research. The main contradiction on this layer is that in the public sector, coordination is often based on a hierarchical approach and relies on some form of authority. However, in a network, the partners have a certain degree of autonomy. Especially private organisations are outside the government's hierarchy and have different interests. The tension is thus primarily between authority and autonomy in networks comprising both types of organisations.

6.3.1.1 A complex network: interests and values

In almost every situation that features multiple actors with some degree of autonomy, there is a political dimension to the interdependencies. Actors, institutional structures, (conflicts of) interests and outcomes are all part of a political process (Landman, 2003; Malone & Crowston, 1994). Such political processes evolve around the concept of power and the ability to cope with various power positions. However, as Joseph S. Nye strikingly notes, "power, like love, is easier to experience than to define or measure" (Nye, 2005, p. 59). In the coordination of networks of organisations, the relative power positions of the actors involved play a role. Also, the allocation of resources is often the outcome of a political process. Furthermore, the concepts of power and political processes are essential to understand that the current arrangement of a network, organisation or service delivery structure is the outcome of a previous (political) process and a dominant actor or coalition of actors may have (vested) interests in the status quo (Lieshout, 1993). In collaboration, also for technical elements, politics play a role (Bekkers, 2009).

Although power plays an important role in the dependencies between actors (such as departments, organisations or networks), the interactions between the actors that are part of a service delivery structure are often many and complex. In such situations, exerting power may come at greater costs than in one-time interactions (Axelrod, 1984). Therefore, those actors build long-term relationships based on trust (Madhok, 1995). This creates a stable environment that facilitates cooperation, which is an important ingredient in these networks.

In networks for public service delivery in which private parties play a role, specific concerns arise on differing and potentially conflicting goals, values and interests. In § 3.2.1, we have described some concerns found in existing literature on the fact that private organisations have other goals than public organisations have. Furthermore, from a public value perspective, the goals and interests of private organisations may be conflicting with public values such as transparency (which might threaten the competitive position of companies), equality of access for every potential service consumer (conflicts with economic rationale of focusing on profitable customers), and privacy. In the public-private service network described in the RDW case study (§ 5.2) we found that the (leading) public parties in a network have to warrant the public values that are to be realised in the network, a view consistent with what we found in literature.

Improved public service delivery, by integrating fragments across boundaries between organisations and sectors, can also be considered a public value, realised by collaboration between government organisations and private parties. In the explorative case in chapter four, we found that public organisations also have various reasons for joining a service network. Some organisations may be forced by law or through hierarchy to join-up with other public organisations and offer their services through a one-stop-shop. For another organisation, its participation in a joint service delivery portal allowed it to realise (existing) goals better. Thus, also public organisations can have different interests and goals for collaborative networks. Furthermore, even though the government partners in a network have to warrant and realise public values, this is not limited to the realisation of such value for the final service consumer only. An important value is that of good governance; the government parties in the network have to be a reliable partner for the private organisations in the network. In chapter four this is illustrated in the scenario in which multiple care providers offer their services through a single service delivery portal. To ensure a fair competition, the ease of joining the shared portal is an important value towards the partners in the network. Furthermore, in the RDW case study we have seen that good governance is required to ensure a stable network that is able to keep improving its operations.

Finally, there can be exogenous factors that play a role as well but cannot be influenced by the network. For example, Kenis and Provan (2009) found that the way a network is incepted (mandatory or voluntarily) affects the performance of the network. Furthermore, the interviewees in the RDW case (§ 5.2) argued that the stable policy domain of the network contributes to the performance of the network. They expect that in more (politically) turbulent domains (such as social security) the collaboration in networks is more difficult as there is less stability in the policy domain. As this research is not comparative in nature, we cannot make definitive statements on this.

6.3.1.2 Governing the network: dealing with autonomous actors

Politics, power, varying goals, interests and values all have an influence on the management of a public-private service network and the service delivery by such networks of organisations. Governance and management is required to coordinate the dependencies between the parties that are part of the network. In such networks, private partners can, for example, add their products or services for integrated service delivery spanning both the public and private sector, creating a so-called continuum of care (Milward & Provan, 2003). For example, in the RDW case, companies form the service delivery channels in the vehicle administration network, in which a service consumer can use a channel that is closest to his or her process. The private organisations then become intermediaries in service delivery (Klievink & Janssen, 2008b). Another form of incorporating private parties that we describe in chapter three is that of competitive contracting, in which governments 'steer' rather than 'row' (Milward & Provan, 2003; Osborne & Gaebler, 1992). In both situations, the government can coordinate by acting as the manager of the network. Another form of coordinating networks is by regimes in which the parties involved cooperate (cf. Keohane, 1984). In the first case study we found these two forms as well (see § 4.2.1.4).

Literature suggests that the role of traditional management of government, in which government provides services itself, is declining, whereas the role of parties outside government is getting more important, which introduces the challenge for governments of managing this (Kettl, 2002). Both in theory and in practice, in the first stage of the empirical research, we found that one of the challenges for coordinating networks exists in the fact that most of the actors involved are (in varying degrees) autonomous. This certainly applies to private parties, which are outside the government's control. But it also applies to a certain extent to public organisations. Many public organisations have a fragmented structure in which relatively autonomous departments have their own way of working, use their own applications, and have direct contact with service consumers they consider theirs.

Thompson (2003) differentiates between coordination and governance, in which governance is the regulation of the elements that are made to act together, through coordination. Organisations have various governance mechanisms in place, also to deal with interdependence. However, there are also interdependencies between the various governance mechanisms and therefore we do not see governance as distinct from coordination, but an element of it. Thompson, who says that both are on the same continuum, also acknowledges that the demarcation is not clear.

For the networks, setting up a network administrative organisation is generally seen as a good practice by the interviewees we consulted in interview series, provided that such an organisation has the political and organisational power to execute essential

coordinative tasks, such as prescribing standards and setting up a basic infrastructure. Other parties in the network can then contribute to the service delivery or exchange information and processes through central data registries. Furthermore, the government can serve as a trusted and authentic source of information, or as a network manager.

Within an organisation, a dedicated coordination entity is seen as a successful approach for dealing with the fragmentation within the organisation. This entity can be a person or department with an overview over the service delivery structure and the responsibility for aligning and managing its configuration. This is both a strategic and an operational role, in which agreements and contracts play an important role, but cooperation and trust are equally important.

For both approaches, the overall governance of the network has to respect the autonomy of the organisations. We found this particularly in the explorative study in chapter four, in which the development process of an electronic portal encountered that the autonomous parties that need to contribute to the portal also have goals or interests that are not aligned with the goals and interests of other parties, or do not match the goals of the portal itself. As these organisations are not likely to relinquish their autonomy, the coordination of the network has to respect the autonomy and the position of the actors involved. This point is especially clear in interview series, discussed in § 5.1, in which we were told of coordination mechanisms focused on the data layer, as explicit coordination on other layers would meet a lot of resistance by other actors in the network. Thus, a coordination mechanism on one layer to deal with the coordination challenges at other layers.

6.3.1.3 Collaboration: trust and agreements

In organisational and public administration literature, many contemporary articles make the argument that collaboration among public organisations and between the public and the private sector are required to overcome both the inefficiency and ineffectiveness attributed to traditional bureaucracy and the harsh elements of business-like strategies, such as those proposed by the New Public Management paradigm. We have seen that the idea of integrating or joining-up service delivery by multiple organisations has established a foothold in practice as well. In The Netherlands, many efforts are dedicated to improving the operations of government by integrating service chains, developing one-stop-shops, and offer joined-up services through a web portal. Many e-government building blocks have been developed to provide a shared architecture for providing integrated services and procedures to service consumers.

Many service delivery chains are, however, focused on the activities that public organisations play in a specific domain. Applying a network concept on service

delivery expands the scope and thereby the number of service providers involved in service delivery. The explorative study described in chapter four illustrates that private partners are included in the service network to complement the partial service delivery that is provided by government organisations, albeit using two different models. In one scenario, multiple private service providers offer similar services through the portal, in which the portal combines the required services provided by public organisations and the service offerings of private organisations. In the other scenario, the focus was on a continuum of care approach to service delivery, in which service delivery activities of public and private organisations take turns and jointly provide an integrated service delivery process that matches the service requirement of the service consumer. However, including private parties introduces challenges, such as the ones described above (potential conflicts of interests and different values), but also institutional and legal challenges. Some information may not be shared with private organisations. Furthermore, some infrastructural facilities for e-government, such as the current Dutch national e-authentication facility (DigiD), may currently not be used by private parties.

A collaborative mind-set is an important ingredient for coordinating any network, according to the people that have experience with such coordination mechanisms (chapter five). This applies both to the coordination of organisational networks and to the networks within organisations. To elaborate on the latter: given the interdependence between rather autonomous departments within many organisations, coordinating the efforts of the individual departments in such a way that concerted action can be realised is required. The formal hierarchical structure of the organisation enables some hierarchical control over these actors, but good relationships and a cooperative stance towards a shared goal are deemed more effective for achieving these goals than that which can be achieved by an authoritative approach.

A collaborative approach to service delivery is related to trust in networks. In theory, we found that a stable environment and a collaborative approach enables partners in a network to develop trust relationships. Also in the empirical cases, the interviewees stressed the importance of trust (chapter five) and we found that a lack of trust in the authentication facilities of external parties hindered the organisations in selecting a global authentication service, although they preferred it to federated authentication (§ 4.2.1).

In the RDW case study (§ 5.2), trust is highly interwoven with other elements of the coordination of the network. On the one hand, the RDW approach focused on continuity of the network operations, in which the RDW behaves as predictable as possible, whilst putting effort in communication towards the partners in the network. As a result, the parties in the network entrust the RDW the role of network

coordinator. On the other hand, to detect and reduce opportunistic behaviour, the RDW has formal agreements, service level agreements (SLAs), spot checks, and a sanction system in place. Furthermore, if the parties disagree, there is a clearly defined relationship management with escalation procedures. Trust cannot be seen independent from these elements; they contribute to the development of trust between the parties, whereas trust from the network partners in the RDW also enables the coordination role that the organisation plays. Trust is thus important, but not sufficient to coordinate the interdependencies on the network level. Formal contracts and agreements play an important role as well, even though some interviewees acknowledge that in case something goes wrong, waving with a SLA document does not solve the problem. For that, collaboration is required. Agreements can take variety of forms, such as contracts, procedures and documents that describe the collaboration and means of interaction between the parties in a network. Such agreements may be very complex, containing documentation, financing, technical details and many detailed arrangements (Grimsey & Lewis, 2002).

6.3.2 The process layer: cross-agency service delivery processes

In this section, we describe the three sub-layers at the process layer in the framework. One of the main determinants for how the cross-organisational service delivery process looks like is the form of the process flow across the boundaries of the fragmented organisations. We make a distinction between sequential processes with a predictable line of action, and reciprocal process flows that are less predictable.

6.3.2.1 Allocating roles and responsibilities

To facilitate coordination in a network, agreements define the relationships between actors. The actors (e.g. organisations) play a specific role in the service delivery network. It is therefore necessary to clearly specify the various roles in the network, and setup agreements between those roles. Responsibilities have to be assigned to these roles, such as the responsibility for a specific part of the service delivery process, but also for safeguarding privacy in their processing of sensitive information. The roles that actors in the network play, and the responsibilities attributed to those roles have to be made clear in order to ensure that every party plays its part (cf. Janssen, et al., 2006).

Another important role for clearly specifying the responsibilities is tracking accountability throughout a service delivery process in a network. As a part of democratic governance, government organisations have to be accountable for their service delivery. In networks, this is a challenge. Within the traditional public organisational structures – bureaucracies – transactions are part of a (more or less) cohesive hierarchy that is responsive to central leadership, whereas parties outside government are not fully controlled which makes it difficult to transfer accountability

to those parties (Posner, 2002). Furthermore, as especially private organisations may have an interest in not disclosing the way they work, the visibility of what happens within partners in the network can be low, which further impedes the government actors to bear accountability for the overall operations of the network. The relationship between roles, responsibilities and accountability is discussed in the first case study (§ 4.2).

In § 5.2, we have seen that the need for accountability affects the coordination mechanisms employed in the network. Mechanisms at various layers are a manifestation of the need for the ultimate (ministerial) accountability of government activities. This accountability is transferred to the RDW, which in turn ensures accountability by means of its authorisations, which includes prescribed ways of working and interacting with the RDW. Finally, formal checks, such as audits, are conducted to verify that the way the system (the network) works ensures its accountability.

6.3.2.2 Organisation structure: fragmentation and existing coordination

In theory, networks are often positioned as a form of organising in between hierarchies and markets. In relationship to public service delivery, the traditional public organisation is regarded as a hierarchical way to offer public service. In public management views that focus on business-like strategies and outsourcing to the private sector, the market approach is more applicable. Networks for service delivery are about collaboration between parties in both sectors. We have used the term 'public-private service network' for such networks for cross-organisational service delivery. The issue with these core forms of organising is that they are attributed different base forms of coordination. For the public partners in a network, hierarchy is both the inter-organisational and the intra-organisational form, whereas for private organisations, the external environment is more of a market structure (although this depends on the type of organisation and its activities). Because public and private organisations are part of a network for some specific goals (i.e. service delivery), they are likely to also have other activities in other situations and networks. Take for example a private party that – for their everyday business – uses the price-mechanism to deal with other actors. In a public-private network, they will have to employ other mechanisms, for example based on trust and relationship building. Because they operate in both environments at the same time, these organisations have to be able to combine different ways of organising and of coping with interdependence. The same applies to public organisations; in their 'natural' environment they are often able to rely on a formal and bureaucratic structure to control certain activities. In the network, they encounter organisations that are not subjective to the same level of authority (this of course varies per type of network, networks focusing on security will likely need strict compliance, more than in networks that derive added value in

service delivery from private partners). Within public-private service networks there are, thus, different types of organisations that – in their 'normal' environment – apply different inter-organisational mechanisms for coordination and governance.

In the first case study, we found that this difference affects – among other things – the allocation of roles and responsibilities and the decision making structure, in which the top-down authoritative approach found in hierarchy cannot be applied to the private partners in the network. Furthermore, whereas public organisations can be forced to perform a certain role in service delivery, private organisations cannot. If private organisations decide to no longer collaborate in the network, the continuity of the shared service delivery can be in danger. In the RDW case (§ 5.2), we found that the benefits for the private partners are sufficiently high for them to get involved (note that we have not analysed the incentives for parties to collaborate). As we have described above, collaboration and trust are important elements in networks, which is consistent with the theoretical approach to coordination in networks. According to some network theorists, network based approaches are better than hierarchy based approaches for the act of governing (Kettl, 2002). Kettl notes that government management cannot use the same control mechanisms that can be used within an organisation. None of the actors have the power to determine the strategies of the other actors in the network (Kickert, Klijn, & Koppenjan, 1997).

Coordination within versus coordination between organisations

However, the theoretical distinction between hierarchies, networks and markets is not so clear in practice. In the empirical chapters, we have referred to the abovementioned inter-organisational interdependency as coordination 'between' (i.e. between organisations). The coordination 'within' is then the coordination that deals with the interdependency within organisations, as dependencies exist also within organisations and departments. Often, service consumers have to interact with multiple departments to have their service request fulfilled. What is regarded one process by the service consumer is often a set of activities and functions for the (government) organisations involved. In non-integrated service delivery, service consumers have to coordinate the various tasks that are part of the greater service delivery process. To take over this task from the service consumer, organisations started to bundle their services in the various channels. Since this does not solve the fragmentation of the departments that goes behind those channels, the various processes that run through the departments have to be coordinated as well.

This has to deal with the boundaries between functionally differentiated departments that play a role, those between the front and the back office, as well as the ones between the various service delivery channels (or the departments that operate them). Operating a channel (e.g. service desk, telephone, website, mail) is often a task for the front office, whereas the synchronisation of information and the execution of

processes are done by the back office. The services offered to service consumers in the front office are interwoven with many tasks and processes in both front- and back offices. This results in an inflexible or even static situation, which may be difficult to adapt to new developments. Ideally, the channels (including those allocated to private parties) operate independent from the specific processes in the organisation. This enables service consumers to choose their own channel, which in turn can access all information, resources and processes needed to fulfil the service request. However, the variety in systems, processes, goals and culture makes it hard to realise this. A coordination arrangement should address these issues, for example by distributing roles and responsibilities that are enforced by agreements (e.g. SLAs) or by allocating the coordinative tasks to one entity (e.g. a coordination department).

Thus, many organisations have a fragmented internal structure, in which functional siloes provide individual services to citizens, businesses or other (government) organisations. Such silos have their own information systems, back office processes, ways of communicating with service consumers, etc. As we have seen in the study, organisations are not only working towards cross-organisational service delivery, but also attempt to overcome the fragmentation within the organisation (cf. Klievink & Janssen, 2009b). This is done, for example, by integrating data registries and information systems, combining back offices and generalising business processes. The idea is that organisations increasingly work according to an (enterprise) architecture. In The Netherlands, a number of reference architectures have been developed for different domains of government (NORA for the national level, GEMMA for the municipal level, PETRA for provinces, WILMA for water boards, to name some). The challenge is to align the efforts put into the coordination of the dependencies within an organisation with the efforts needed to coordinate the inter-organisational dependencies. When looking at the scenarios in the first explorative case study, municipalities are involved. However, when looking in more detail we see that only one or a few departments within that municipality are actually involved in the work domain or in the social support domain. There are other departments within the same municipalities that are working on entirely different things. The functional fragmentation within such organisations might make sense from the perspective of an integrated service delivery chain, even though it hinders an integrated organisation. The coordination efforts within organisations therefore need to anticipate on the coordination requirements that follow from the variety of networks of which the actors within the organisation are part. A strictly hierarchical approach to integrating the organisation may be contra-productive in the end as it leads to sub-optimal cross-organisational service integration. In § 5.1, we have seen that whereas some organisations start with an extensive front office transformation, ultimately the back office needs to be redesigned as well. When redesigning back office (processes), the same section also indicates, along with the findings in the RDW case study (§ 5.2),

looking at service networks instead of the individual organisations helps to assess the different coordination needs and mechanisms within and between organisations.

6.3.2.3 Different process flows and forms of interdependence

In linear or sequential process flows, the coordination mechanisms can be aimed at systematizing the cross-organisational process, whereas in reciprocal processes, the process flow is less predictable and the interfaces between the actors and their activities are the most important point of coordination; this is where the 'fit' has to be made. Realising a shift in the decoupling point requires that the joint service providers coordinate the overall service delivery process flow and thus attune their individual activities to one another. Dealing with the interdependence between the various activities is the major coordination challenge at the process layer, which we describe by discussing the consequences of the differences between a sequential and reciprocal process flow.

Coordination mechanisms for predictable processes and sequential form of interdependence

The social support scenario was the first scenario designed and used in the study of the conceptual demand-driven portal for integrated service delivery. As described in § 4.2, the technological support for the portal in this scenario was based on predefining the cross-organisational business processes and the automation thereof, driven by the technological developments and the need for improving the efficiency of processes. The processes are built from smaller components, called web services. The overall service and its relation to the underlying web services are represented in an executable process definition that specified the process flow.

The focus on web services enables decoupling functionality from the technical implementation of the functionality and thereby offers a way to align processes in public-private service networks, without infringing upon the underlying organisational structures, processes and systems. The coordination of the dependencies in a cross-organisational process flow can be done using process orchestration. Process orchestration is the goal-oriented coordination by a single responsible entity in a cross-organisational process flow (Janssen, et al., 2006). There are a number of orchestration variants possible. Essential parts of any orchestration variant are determining which organisation is overall responsible for the service and which organisation handles the customer interactions. When considering other design variables, many more specific variants of orchestration can be derived. The basic models on the allocation of the primarily role of orchestration are the following:

- First-in-chain; the agency that delivers the service is responsible for the orchestration of the entire chain and returns a single answer to the user. This can be a different agency depending on the point of entry in the service chain;

- Pass-the-buck; the agency that delivers the service shifts the responsibility for (parts of) the execution of the process to the agencies directly involved in executing the next process step (or part);
- Director; agencies in the partnership create a separate process orchestration role and allocate this role to one actor. This could be a new organisation or any of the organisations most qualified to perform this job. The actor fulfilling this role is orchestrating the cross-agency process; thereby becoming a specialized director.

Note that these are operational roles. However, previous research on orchestration of electronic governmental services (e.g. Janssen, et al., 2006) shows that governance-related issues should be considered as well. In order to successfully orchestrate these service delivery processes, agreements need to be made on issues such as lead-times, accountability and information sharing (Gortmaker & Janssen, 2007).

Independent of the choice made for a specific orchestration variant, the service delivery process resembles that of a supply chain and is most similar to the situation depicted on the left in Figure 9. Most cross-organisation service delivery processes are looked at from a supply chain perspective. Therefore, many Dutch initiatives focus on supporting and improving service delivery chains. Still, such chains are in fact networks that consist of a variety of actors. Within these networks, there are many interactions among and between departments and organisations. In fact, it is often departments within an organisation that interacts with other departments and organisations, whereas other departments in the organisation play a role in different networks. Still, for the developers of the portal, coordination was primarily seen as managing the interdependencies between components of business processes (e.g. web services) and decisions on choices that follow from that perspective, such as which organisation handles contact with a client and is overall responsible for the service delivery.

Coordination mechanisms for a less predictable line of action, with reciprocal interdependence

In the work re-integration scenario, it proved harder to select a coordination mechanism for the portal. In this scenario, service delivery processes at the various providers are interwoven, making it difficult to determine what the precise service component is that each party delivers and how these components can be modularised to use in a demand-driven portal for various contexts. As discussed in chapter four, the nested structure of service delivery, responsibilities and performing activities on behalf of the overall process complicates the coordination of the service delivery by this network. The internal structure of the network cannot always be hidden from the service consumer; a third party provider may need to contact a service consumer directly, but for the service consumer the original service provider (i.e. UWV) is the

point of contact and is held responsible. Due to this reciprocity, the interactions are less automatable than in the social support scenario, with its more sequential form.

As the form of interdependence is different for both scenarios, the focus of the coordination mechanism differs as well. In terms of the coordination mechanism of Thompson (1967) and March and Simon (1958), the theoretical forms of coordination applicable to the relatively predictable situation and process flow in the social support scenario are coordination by plan, or even standardisation. In the less predictable situation of the work re-integration scenario, coordination is primarily achieved by mutual adjustment (J. D. Thompson, 1967). The orchestration variants discussed earlier are a form of coordination by plan when it comes to assigning the orchestration role. For the orchestration of web services into business processes, coordination is achieved by standardisation. It is thus useful to distinguish between coordination of interdependencies between systems and data, and the coordination of interdependencies in roles and responsibilities in the overall business process.

For the work re-integration scenario, the lower predictability leads to coordination by mutual adjustment, which requires that more information is shared between the actors. The interactions between the actors are thus very information-laden. If we would apply the coordination mechanism of the social support scenario to this scenario, the plan (orchestrated business process) would need to be very flexible to enable the wide variety and sequence of interactions that are possible. However, due to a higher need for sharing information about the case file and the running process, the technical interfaces between the service components (i.e. the web services, as for the portal a choice was made for service oriented architecture) would need to be able to exchange a lot of varying information, making the interfaces consequently 'thick'. However, defining thick interfaces for (almost) all routes the cross-organisational service delivery process can take through the network of organisations takes a lot of work and blocks adaptability. Whereas web services enable loose coupling, it relies on coordination by plan, which is a pre-defined overall business process. As the organisations are (to some extent) autonomous, there is little room for changing the internal processes in the organisations. In the work re-integration scenario, the organisations rely heavily on the activities of the partners in the network. Clear and realistic expectations about the activities and performance of the partners are necessary for ensuring continuity in service delivery.

As, due to the autonomy of the actors, there can be limited or no interference in the way organisations handle their responsibility and how they realise their part of the service delivery, the continuity and realisation of the overall service delivery is warranted by agreements or contracts. In the case, this was sought at in SLAs. The progress of overall service delivery is warranted by making these SLAs about the quality of the output of actors instead of about throughput. At the same time, the

flexibility in the process execution is accommodated in the technical interfaces between the systems and data of the actors in the network.

6.3.3 The technology layer: information systems and data

Already in the background of the study, we found that interoperability is a major challenge. This challenge can be dealt with in a variety of ways, ranging from tightly coupling information systems and integrating data sources, to interconnecting existing systems and data through loose coupling.

6.3.3.1 Shared data registries

In both the interview series (§ 5.1) and the RDW case study (§ 5.2), the role of a shared data registry in the network becomes clear. In fact, a number of interviewees pointed to situations (In Belgium and Canada) in which a network coordinator performed its task by governing the central data registry in the network. In these situations, the organisations are defined by their role in the network. Having the same information throughout the entire network is most important there, the presentation of data objects is left to the various actors that actually present data. Both in Belgium and Canada, interviewees pointed out that coordination by governing data and facilitating its exchange between parties in a network is a dedicated strategy to avoid the difficulties found when addressing the fragmented layers of government.

In The Netherlands, there is a tendency to focus on a network of basic registries. The basic registration on vehicle information that was discussed in the RDW case is one of them. Furthermore, the municipal records of citizens (GBA) are an important registry that is used by many organisations. The GBA is also found in every part of the empirical research. It is very important that such a central data registry provides accurate and adequate data to the network.

6.3.3.2 Interoperability of information systems

Also from a technological perspective, shared activities present a challenge. As we have discussed in (e.g.) § 5.1.3, many organisations have developed various systems in the past decades. Furthermore, organisations and departments in them have various data registries and information needs. As a result, a major challenge is to speak the same language. In this, we refer to both natural language and technology languages. Many organisations for example use the data object ‘income’ for their activities, but for one organisation it is used to register how much a service consumer can spend (i.e. net income), whereas an employer may mean the gross income and may include or exclude social and pension premiums, and the Tax and Customs Administration may use a slightly different definition. In terms of technical languages, organisations have their own systems that each speaks a different language and thus has to be

'translated'. In the RDW case, (XML) messages are exchanged with other actors, but are internally converted to protocols that can be handled by the mainframe.

Interoperability between systems and information has some history, for example, Electronic Data Interchange (EDI) played an important role and later on, middleware and workflow were added to that (Tewoldeberhan, 2005). Currently, opening up functionality by services is the dominant paradigm. Given that electronic communication is crucial when executing public services, the actors need to agree on what information is used, what is meant by it (i.e. semantic standardisation), and how that information is exchanged.

To ensure availability of all necessary information at the right place in the network, a shared and up-to-date basis of information or data in the network is essential. The exchange of data or information, such as handing over a case to partners for their part of the process, and the interactions between service providers are largely automated activities. Given the fragmentation of organisations, the information architecture is very fragmented as well. As a result, every department within an organisation may have its own information systems, its own formats, guidelines, etc. Interoperability is therefore very important. It is necessary to coordinate the various sources of data, information and systems. Information sharing is a powerful coordination mechanism for collaborative government (Gil-Garcia, et al., 2007). Standards play an important role in this since they provide rules, guidelines and characteristics (ISO/IEC definition, in De Vries, Verheul, & Willemse, 2003). Standards can be agreements (voluntary or enforced) on many topics, such as measurements and quality, which makes standardisation itself also a difficult process (Egyedi, 1996). Electronic communication is also a subject that needs agreement on the specification used as even small differences may have large consequences. There are also standards for the technical exchange, part of the Dutch reference architecture for municipalities (GEMMA) is the StUF standard (in Dutch: Standaard Uitwisselings Formaat), which is used to standardise the format for exchanging data.

6.3.3.3 Shared activities: information systems and basic facilities

Much of what is described here above, on the coordination of sequential and reciprocal processes, is closely related to the coordination challenges that arise from the activities of the various actors in the network. Where the previous section discusses the interdependencies between the activities that take place within an organisation and specifically the activities that interact with other actors, there are also activities that have to be shared between the service providers. In § 4.3.2, some important shared activities that play a role in joint service delivery portals have come up. These include the authentication and authorisation of the service consumer and the activities related to service discovery and selection. For electronic service delivery, this means that some of the functionality provided by a portal transcends the

level of the activities of individual organisations. Broader, the rise of shared service centres (e.g. Janssen & Joha, 2006) also presents shared activities, although one could consider a shared service centre an additional actor in the network.

In the Dutch situation, an increasing number of shared activities are facilitated by infrastructural facilities at the national level. The My Government page that was briefly discussed in both chapters four and five provides such a facility for sending electronic letters to citizens. Furthermore, the national authentication facility DigiD is, although operated by a specific party, a shared activity of a portal that aims to offer single-sign-on to avoid that a service consumer has to authenticate again for every individual service provider. As we have discussed in the first explorative study, a major issue here is that private parties are not allowed to use this facility.

6.4 Implications for the practice of coordinating networks

Public-private collaboration (e.g. partnerships for infrastructural projects) is often managed on the level the relationship between the partners in a service network, which are specified by agreements, contracts, procedures, etc. (e.g. Pongsiri, 2003). Coordination in such collaboration arrangements is thus often horizontal, with inter-organisational coordination at a level that respects the autonomy of the organisations. The coordination across layers, thus the coordination of the interdependencies between departments, processes, systems, etc., is often focused within organisations only and approached in a hierarchical fashion.

A public-private service network is, however, not a project. Furthermore, such networks are not hierarchies either. It is a structural and continuous collaboration in which the (autonomous) actors have to coordinate the enduring and repeating exchanges that come with the operations of the network in order to cover the full service delivery. Coordination in a public-private service network is much more than allocating roles and responsibilities, more than assigning a project manager, more than interoperable systems. Public-private service networks have dependencies both within and between organisations. However, the inter-organisational coordination does not only take place at one layer and the coordination does not only apply to the dependencies within an organisation. In public-private service networks that are interdependent for every element of the network, the inter-organisational aspect also needs coordination across the layers of the framework and not just horizontally between organisations, at one layer. The layers in the coordination model all apply both inter-organisationally and within organisations. The RDW provides a good example; it is not the internal vertical coordination within such a large organisation, which needs to be accompanied with e.g. contracts to coordinate the inter-organisational elements, but the coordination is vertical as well, with coordination – in coherence – on the multiple layers. Those layers thus also exist between the actors in the network. Therefore, the model applies to vertical inter-organisational

coordination. This stresses the interdependencies between the layers, as a coordination focus on one layer can affect the coordination burden on other layers.

This interwovenness of the layers and the inter-organisational element is a fundamental feature of the coordination model. The layers reflect the inter-organisational dependencies and are themselves interdependent.

To translate this finding to practice, we propose that for each level of interdependence there is a trade-off that characterises the main determinant at that layer for the overall coordination challenge. For the network of organisations this is the tension between authority and autonomy. This was extensively discussed in the empirical chapters and comes up in multiple places in § 6.3. The basic idea is that organisations often use an authoritative approach to deal with coordination challenges within the organisations, an example of such an authoritative approach is the coordination entity that came up in the interview series. Furthermore, the hierarchical approach of the public sector and the autonomy of actors in network and market approaches are also examples of this tension.

At the level of the cross-organisational process flow this determinant is the difference between sequential and reciprocal process flows. At the level of information systems, this is the tight versus loose coupling of the technical elements. Although both have been discussed above, we discuss their implications for practice in this section.

6.4.1 Predictability of the line of action

One important result of the empirical studies is that the form of the service delivery process affects the general coordination mechanism that can be used. In the social support scenario in the first case and in the RDW case, the cross-agency service delivery process was rather sequential. Activities follow upon each other and ultimately all the steps need to be made in order to realise the service. In the work re-integration scenario of the first case, we found that cross-agency service delivery processes can also have a reciprocal character to the extent that the process flow is more likely to resemble a plate of spaghetti than a linear line. If the various activities that make up a process are also performed by autonomous actors or civil servants that have much discretionary powers, the actual flow of the service delivery process in practice is less predictable than the flow in a linear process in which both the steps and the potential outcomes of these steps can be specified in advance. Therefore, we argue that the predictability of the line of action affects the coordination mechanisms that can be employed in a service delivery process. Furthermore, improved service delivery urges organisations to work as service delivery networks, in which the service delivery process crosses the boundaries between the public and private sector. As a result, we expect that a low predictability of a process flow is an effect of making service delivery more demand-driven.

Coordination mechanisms that rest on well-specified process flows, such as business process orchestration, cannot be easily applied to processes that do not follow a highly predictable line of action. To ensure that such a process will lead to a result (i.e. a service) that contains all necessary components, thus that requires that every necessary activity is performed somewhere in the process, the interactions between the activities and the actors that perform them have to be coordinated flexibly to accommodate this characteristic of the process flow.

6.4.2 Tight versus loose coupling

As fragmented and legacy systems have different ways of working and make it difficult to realise interoperability with other systems, the general technical approach adopted for cross-organisational service delivery is based on a rather loose technical coupling. As we discussed in § 3.1 and § 3.2, technical developments enable that overall business processes can be created from smaller pieces of functionality, such as web services. These web services are a way to open up functionality from different systems is a way that makes them interoperable. In chapter four, we found that for sequential processes, the coordination is focused on the overall process that is rather predictable and thus easier to define in advance.

However, the coordination in the re-integration scenario is focused on the interfaces between the elements in a service delivery process. As the line of action of the service delivery process cannot easily be specified in advance, the coordination of the technical interdependencies has to be very loosely coupled as every actor in the network may at some point in a process interact with any other actor.

Given the interwovenness of the layers, ensuring that a service is realised in a situation of very loose technical coupling may require a clear allocation of roles and responsibilities of the actors in the network, backed by formalised relationships. Due to such formalisations, the service network becomes more tightly coupled at the agreement level.

This finding is related to the observation made earlier on the interdependency between coordination in the top layer of the model and coordination focused at the lower layer; coordination focused on the data level – for example by the theoretical coordination mechanism of standardisation – reduced the coordination load on the organisational and political level in cases where the latter is very difficult. The argument can be made the other way around as well; in service delivery networks that are difficult to automate, high level coordination by general agreements and relationship building – related to the theoretical coordination mechanism of mutual adjustment – can be used.

This all illustrates the interplay between the layers and the way a network is coordinated. Very loose technical coupling requires tighter coupling at the

organisational level (e.g. by providing more steering through agreements and contracts), whereas loose organisational coupling requires that the more technical levels are coupled tight enough to ensure that the network is able to do something. A focus on one relieves the other. As we found in the interviews, this can be a deliberate strategy. In public-private service networks, a major reason can be found in the autonomy of the actors involved, which can be accommodated by loose technical coupling. To ensure that the goal of the network (i.e. the joint service delivery) is realised, other mechanisms are used. The coordination is thus, in fact, in both.

6.5 Towards an application in practice

Coordination requires the making of trade-offs and design decisions on various interdependent layers of coordination. The coordination framework aims, in answer to the first part of research question four (RQ4a), to assist in this by aggregating the results from the literature survey and from the multiple empirical research steps. This framework represents multiple layers of interdependence, based on the three generic layers that we started with: the organisational setting, the cross-organisational process, and ICT. As we found that data has coordination challenges of its own, we expanded the last layer with a specific reference to data. Within these generic layers, we identified a number of levels of coordination that play a role in public-private service networks. **Figure 10** shows the coordination framework, with the three main layers and a total of nine sub layers that represent the complexity that exists within the layers. The horizontal arrow represents that the interdependencies between actors in a public-private service network exists at all of these layers. The vertical arrow indicates that the layers are themselves interdependent. This is the reason why in some networks, the coordination is focused on one layer only in an effort to deal with coordination challenges at other layers (see § 5.1).

The layered approach to coordination allows us to unravel the coordination in public-private service networks. Even though the framework is not necessarily exhaustive, it provides a way to assess coordination in public-private service networks in more detail as it allows differentiating between a variety of interdependent elements and coordination mechanisms. In the previous section we argued that each layer produces a balance that reflects a major characteristic of a situation and determines the overall coordination challenge:

- Authority versus autonomy of actors (see § 6.3.1 and § 6.4.2);
- Sequential versus reciprocal process flow (see § 6.3.2 and § 6.4.1);
- Tight versus loose technical coupling (see § 6.3.3 and §6.4.2).

Although this is a somewhat simplified view of the complexity described in this chapter, it represents how the interdependencies in cross-organisational public-private processes exist on all three layers, which are interwoven. Based on this view,

actors can choose to focus coordination mechanisms to address the interdependencies at the level that involves the smallest overall coordination challenge. In other words: if a certain situation poses immitigable issues of autonomy at the organisational level, an authoritative coordinator at the organisational level to address the interdependence will not work. If some authority is needed, this can for example be achieved by controlling the data in the network. We found strategies in which actors can reduce the overall coordination challenge; they can seek coordination mechanisms to deal with the interdependence in a way that coordination challenges are smallest and best surmountable. Dealing with coordination challenges where they are smallest, however, requires a multi-layered view as represented in the framework. Using the framework thus enables actors to reduce the overall coordination challenge.

Based on this chapter, we put forward the proposition that not just a multi-layer perspective on coordination is needed, but that the layers are themselves interwoven. This is the key characteristic of the framework. Therefore, we assess this by putting the framework to practice. For this, we use two archetypical situations, based on the three 'determinants' discussed above:

- A predictable, sequential process flow, in an organisational situation that primarily relies on authoritative approaches and has a tight technical coupling;
- A reciprocal process flow, which requires loose technical coupling between the autonomous actors involved.

Of course, all variations on these three determinants are possible, but we have chosen these to see how the framework is needed to assess the coordination of public-private service delivery. Based on what we have seen in the first study, the first archetypical situation is closest to how public organisations typically operate service delivery processes; the second is closest to the demand-driven integrated service delivery that the portal of that study sought to realise. In the next chapter, we use these two archetypical situations to put the framework to practice. The first situation will be used in a simulation game to see how the framework can be used to analyse where coordination goes wrong in a representation of typical real life setting. The second will be used to demonstrate how the framework can be used to come up with solutions that coordinate the process flow, using technical means to accommodate the challenges at the organisational level as well.

7 Putting it to practice: a game and technical demonstrator

"We are laughing about it, but this is the bitter reality"

- a game participant, when discussing what went wrong in the game -

In this chapter, we put the framework to practice to see how the interwovenness of the layers in the framework works out in practice. We want to assess how the framework enables seeing the coordination challenges on other layers and if it shows the potential impact of certain coordination mechanisms on other layers of interdependence. We do this in two steps, each based on one of the archetypical situations presented in the last section of the previous chapter.

We use the first archetypical situation in the setting of a simulation game, in which we the setting creates coordination challenges on all layers, even in a relatively straightforward cross-organisational service delivery process and a limited and controlled environment. Second, we put the proposition on the interwovenness of the layers in the framework to practice in a demonstrator of an event-driven service-oriented architecture. This architecture provides a way to deal with the interdependencies on the level of the interfaces between (technical) components in a reciprocal process flow. This requires very loose technical coupling to deal with the coordination challenge at the level of the interfaces and we use the framework to see how this impacts the other layers in the network. Together, these two steps answer the second part (the evaluation) of research question four (RQ4b).

We use these two steps to answer RQ4b, as the game is based on a sequential process flow and primarily looks at the coordination challenges such a flow brings to the organisational layer, where the implications of the tension between an authoritative approach in a network with autonomous actors becomes visible. On the other hand, the demonstrator of the event-driven architecture looks at a technical means to realise a reciprocal process flow. In this demonstrator, we show how the framework enables solutions, as the technical coordination solution needs to be accompanied with mechanisms at the organisational level.

Taken together, these two steps cover all three layers and show how the framework can be used to analyse why coordination goes wrong, which is done in the game (discussed in § 7.1). Parts of our discussion of the simulation game have been published in (Janssen & Klievink, 2010; Klievink & Janssen, 2009a, 2010b, 2010c). In the second part of this chapter, we use the framework to demonstrate how it can be used to develop solutions to coordinate process flows with low predictability of the line of action by using very thin and flexible interfaces between the elements in a public-private service network. This demonstrator, discussed in § 7.2, shows that this

should be accompanied by an organisational structure to deal with these process flows. This second part of this chapter has been published in (Klievink, Janssen, et al., 2008; Overbeek, Klievink, & Janssen, 2009).

7.1 A simulation game

The framework and the case studies illustrate the importance of recognising the organisational side of the coordination of a cross-organisational process flow. Coordination is not just about interdependencies between steps or the activities in a process, but the organisational setting plays an important role as well. In the previous chapter, we have argued that there exists a tension between an authoritative (or hierarchical) approach and the autonomy that many actors in a public-private service network have. Combined with the other two layers – process and technology – we came up with an archetypical situation that resembles the way many public organisations work today. In this archetypical situation, the integrated service delivery process has a sequential form that is rather predictable. This process flow is executed in an organisational setting primarily coordinated in a hierarchical way, relying on some authority to deal with the interdependence that follows from the service delivery process. Furthermore, the process is strongly linked with the information systems that support or execute it; it thus has tight technical coupling.

This situation is common in the majority of the government organisations that were – in any way – involved in this study (e.g. in the first explorative study or the interview series). This approach is also used to integrate services at the level of organisations and sometimes also to integrate services across the boundaries of government organisations.

We use the framework to analyse how the coordination challenges and mechanisms are affected when an organisation working according to this situation becomes a member of a network of public and private organisations. For this, we mimic a real-life situation in which a government organisation depends on a third party for offer an integrated service. This is done in a simulation role-playing game (or game, for short). In this section, we first discuss what a simulation game is and why we use it. Furthermore, we discuss how the findings and elements from this research are translated to this simulation game. This results in a design of the simulation game and a description of the process of such a game. Based on this design, we conducted a number of sessions with representatives from government organisations and businesses (including external advisors or consultants) and discuss the findings from those sessions.

7.1.1 Using a simulation game

Games can be used as an instrument to facilitate the collaboration between actors by enabling them to develop a joint perspective and approach to a shared issue. Such games can also accommodate both quantitative and qualitative research methods to measure the use and success of the game as a process and a developed artefact (e.g. agreements, process, organisational arrangements, etc.) as a result. Such an approach to assess coordination in a complex situation has been used before (Bharosa, 2011). In a game, human participants play a role in an artificial setting that models (an aspect of) reality (S. Meijer, 2009).

Already in the literature, and later also in the empirical phases, we found that collaboration is an important element of networks. Since collaborative efforts are joint, rather than individual (Briggs, Klofschoten, Vreede, & Douglas, 2006), we developed a simulation game in which various actors play a role. This fosters a collaborative mode in which a shared situation is subject of the identification of coordination. The actors need to gain a mutual understanding of each other's roles and the issues that are at play. As in many public sector projects, multi-organisational service delivery requires information sharing, and not just in a technical sense. Information sharing can lead to better decision-making processes, enhanced networks, better control and coordination, improved services, and reduced costs (Gil-Garcia, et al., 2007).

To ensure that the results of a game have real world validity, a game design must simulate the core characteristics of the real world situation (Duke, 1980; S. Meijer, 2009). Therefore, we use the term 'simulation game'. Such simulation games can have a high level of computer involvement, a high level of user involvement, or anything in between (Janssen & Klievink, 2010). In our game, we focus on a high level of user involvement, which play roles in the game setting. Therefore, the simulation game can be considered a role-playing game.

The setup we use in the game needs to capture the essence of the complexity of a public-private service networks, with multiple actors with various positions in the network, fragmented organisational structures and fragmented information systems. In the game, the participants are allocated certain roles and play this role during the game, which is guided by game rules and interventions. To maintain manageability and understandability of the roles and the game as a whole, the game design must reduce the real-world's complexity, but in such a way that essential detail are not omitted (Duke & Geurts, 2004). The game design requires that the "the roles, rules and incentives of the game mimic some real-world phenomenon" (Meijer & Hofstede, 2003).

A simulation game is a meaningful instrument to assess the usefulness of our coordination framework, as it features a controlled environment in which relevant

actors use their expertise from daily practice to deal with the interdependencies and coordination challenges they encounter. As such, a simulation game is an instrument to (playfully) introduce coordination challenges to these actors. Furthermore, the players ultimately create a shared understanding of the issue of coordination in public-private service networks. The underlying idea is that although we cannot experiment with the coordination framework in a real world situation, we can use real world actors in a setting that simulates the core characteristics of the system of interdependencies. The game may also improve the collaboration between the various actors that play a role in integrated service delivery by facilitating mutual understanding and a collaborative process of experiencing coordination issues.

All stakeholders considered, the aim of game is twofold: from a research perspective, we aim to research how participants (which are experts from practice) deal with coordination challenges when they find themselves performing a cross-organisational service delivery process. Second, the game allows actors to understand the interdependence in service delivery networks and to see the consequences of certain coordination mechanisms to deal with these interdependencies. As it is a role-playing game, the game does not have a technical system. However, coordination challenges that arise from legacy information systems and fragmented data are represented in a non-technical way. How this is done is discussed in the design of the coordination game. Apart from mimicking the essence of a real-world situation, another feature of the game is that it should provide an easily accessible way to introduce people to an issue and to involve them in solving it by enabling them to create a shared understanding of the issue.

7.1.2 Design of the simulation game

The game design is based on the lessons of this research up until here. These lessons are represented in a scenario, which is also based on a specific (set of) service delivery processes at the organisations playing the game. This is needed to make the scenario for the game as realistic as possible. Realism is important to enable participants to understand and identify with the situation as well as for the validity of the results. The game is thus designed based on service delivery processes that are recognisable to the participants of the game, and on coordination issues found in this study. Typical issues included the lack of integration of systems, fragmentation of data, unclear responsibilities, and dependencies between organisations and autonomous departments within the organisation. For individual sessions, the generic design is sometimes adapted to a specific situation that is identifiable for the participants of that session. Furthermore, since the game is an abstraction of reality, real-life implications need to be actively sought after. This is done in the evaluation-round of a game session by discussing the experience and how it is related to the real world situation of the participants and the organisation(s) they represent. Given the

goal of the game as an instrument to apply the coordination framework, we evaluate the sessions on the implications that the findings in the game have on the coordination of public-private service networks. These different components of the game are visualised in **Figure 11**.

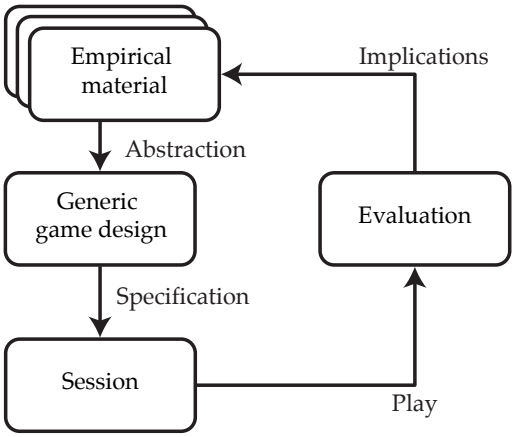

Figure 11: **relationship between empirical material and the game**

We discuss each of these components in turn and start with discussing the input from the lessons of the empirical studies, through the coordination framework, on the design of the game. After that, we discuss the generic game design. Third, we discuss the process of the sessions we conducted. Finally, in the next section, we evaluate the game by relating it to the coordination framework. This evaluation is based on the evaluation-rounds in the game, to avoid confusion it is important to point out that every session has an evaluation round, in which the outcomes of the game were discussed and translated to the daily practice of the participants. On top of that, we evaluate the overall simulation game (including all sessions, which in turn all include an evaluation-round) and its implications for the object of this study.

7.1.2.1 Coordination challenges included in the design of the game

The game is focused on service delivery to citizens by a government organisation with multiple departments. This organisation operates multiple service delivery channels, as citizens and businesses use multiple channels to interact with government organisations, such as a website, telephone, front desk, or intermediary private parties, like in the RDW case. Due to the fragmented structure of many government organisations, the services and channels that are be involved in a single service delivery process may be located at various departments or span multiple organisations. This complexity is further increased by to the often significant level of autonomy that those organisations and departments have, for example in maintaining

their own service delivery channel configuration, service strategy, processes and information systems. Even departments or organisations that do not have direct interactions with service consumers are often involved in the service delivery chain. To enable cross-organisational service delivery, the various coordination challenges that arise from the interdependence need to be coordinated. The way that these are dealt with can take various forms. In many public organisations, a hierarchical, top-down approach to coordinate the interdependencies is typical, whereas we have seen that less authoritative coordination approaches can also be used in service networks. We discuss which coordination challenges we have put in the game and do this per layer of the coordination framework. These challenges were captured in a scenario, which was validated for realism by at least one representative of every government organisation we conducted a session with.

The organisational level

At the organisational level, we bring in the tension between authority and autonomy. This is represented in two ways.

First, we introduce two managers in the game that are at a similar level in the 'main' organisation. Both have authority over their department; one manages the front office of the service delivery organisation whereas the other is responsible for the back office. As these managers are of the same level, solving issues that cross the boundaries between their departments requires them to collaborate. This collaboration is difficult, as the managers have different interests. The front office manager is primarily occupied with improving service delivery to the service consumers. The back office manager has a multi-year planning of releases to realise.

Second, we introduce a third party that is required to offer integrated service delivery, which is the ambition of the main organisation in the game. However, this third party is autonomous and does not answer to the hierarchy of the main organisation.

In short, for the organisational level of the framework, we introduce two coordination challenges: dealing with different positions of actors, and dealing with different interests of these actors.

The process level

At the level of the cross-organisational process, this game matches the first archetypical situation we introduced earlier: it offers a sequential process flow, which (also given the fact that there is a scenario and a set of roles that prescribe it) is predictable. Four types of questions; informative, change in an existing file, creating a new file, and creating a new file based on information that the third party holds, invoke the service delivery processes. However, the organisational structure is fragmented, with designated tasks for each of the three service delivery channels and a clear separation between the front and the back office. Furthermore, the process

crosses the boundaries of the main organisation due to which the activities that need to be performed for the services are fragmented across organisational boundaries as well.

The main coordination challenge at this layer is the organisational fragmentation that needs to be dealt with in order to realise this sequential service delivery process.

The information systems and data layer

The main organisation uses a shared information basis for all services. So, both the three front office channels and the back office work with this information. However, the legacy information system that supports the internet channel results in delays of some transactions made through that channel. Furthermore, the shared information basis in the organisation is not the authentic source of some of the data it holds. The authentic source partially contains newer information and is owned and managed by the third party. Consequently, although there is a shared information basis in the organisation, there is no shared information basis in the network.

The coordination challenges on this layer thus include dealing with legacy systems and fragmented data in the network.

7.1.2.1 Generic game design

The game design consists of four elements; rules, roles, objectives and constraints (S. Meijer, 2009). For the participants, the objective was to serve as many service consumers as possible to the greatest satisfaction of those service consumers. To introduce this as an competitive element, when someone playing a service consumer considers a service process finished and thus returns to the workload to get a new assignment, he or she puts the current assignment in a box indicating whether the service request was handled to satisfaction or not, or if it was not handled at all. This 'customer satisfaction' was shown to the players on a flip-over. Although presented as a goal, this customer satisfaction is actually a means to get people to play their role as good as they can.

The role-descriptions make sure that certain coordination challenges surface in the first round in the game. There is, for instance, also the role of 'the citizen' (the service consumer) in the game. The role descriptions facilitate that a certain course of interactions is followed that leave the client with a frustrated feeling, while still realistic for the person playing the role of the service desk employee. In the game there are eight roles:

- Service consumers (citizens);
- Telephone channel;
- Front desk;
- Website;

- A front office manager;
- Back office employees;
- A back office manager; and
- A network partner.

Depending on the number of participants, there can be multiple players for each role. In fact, to make sure the game gets going, the number of people playing a citizen should be higher that the total number of people working in a front desk role, as this puts some pressure on those players.

The rules of the game define the way the players are allowed to interact. Where the rules limit the game itself, the constraints limit the players in their options for activities that are legitimate under the rules. These rules and constraints are incorporated in the roles descriptions. For example, the telephone channel is only allowed to provide information and to change one data element in the data registry. This rule is one of many that make sure that the overall 'information system' works according to the design. The game offers the flexibility to discuss the rules and their real world exponents. This can even result in a discussion on the appropriateness of certain legal constraints and the need to change laws (e.g. the legal constraints that limit accessibility of non-public organisations to government registries)

In the service delivery game, three service channels are included: the electronic channel, the telephone channel and a service desk. Through these channels, the 'main' organisation that is central in a specific session delivers a few services, including information services and transaction features. Most channels are available for all services, but there is some variation. For example, a service consumer can request information (e.g. status information) at the telephone channel, but needs to use the website or go to the front desk to change information (e.g. personal information). A front office manager, who is responsible for all client contact, manages the service channels. The back office handles changes in information and processes information from third parties. A back office manager is responsible for these processes and the systems and information that are affected by it. It is a system of people, so every bit of information is represented by paper and all roles are played by participants (including the online channel). This stresses the interdependencies that exist between people, roles, information, departments and organisations, without the burden of a specific (limited) computerised system.

A typical session has 12 to 15 participants, distributed over the playing-roles. Depending on the number of participants, the number of people playing the same role varies. However, there are always more people playing a client than people playing a service channel. In that way, some pressure in service requests is created, which gets the game going. In total there are 100 tasks (i.e. questions and transaction requests) that the people that play a service consumer can 'fire' at the service delivery channels.

The types of issues, questions and requests are customisable to improve realism for the participants of a specific session. The generic structure of the game is illustrated in Figure 12.

Before we put the game to practice, we had several trial sessions with academics and a small group of representatives from a large executive organisation in the Dutch government. Based on these trial sessions, we made a number of refinements, ranging from the physical set-up of the game (e.g. we increased the distance between the people playing back office roles and those playing front office roles in order to better represent the actual separation between the two business functions) to the ordering of the service questions and requests, and reducing the role descriptions to no more than one page.

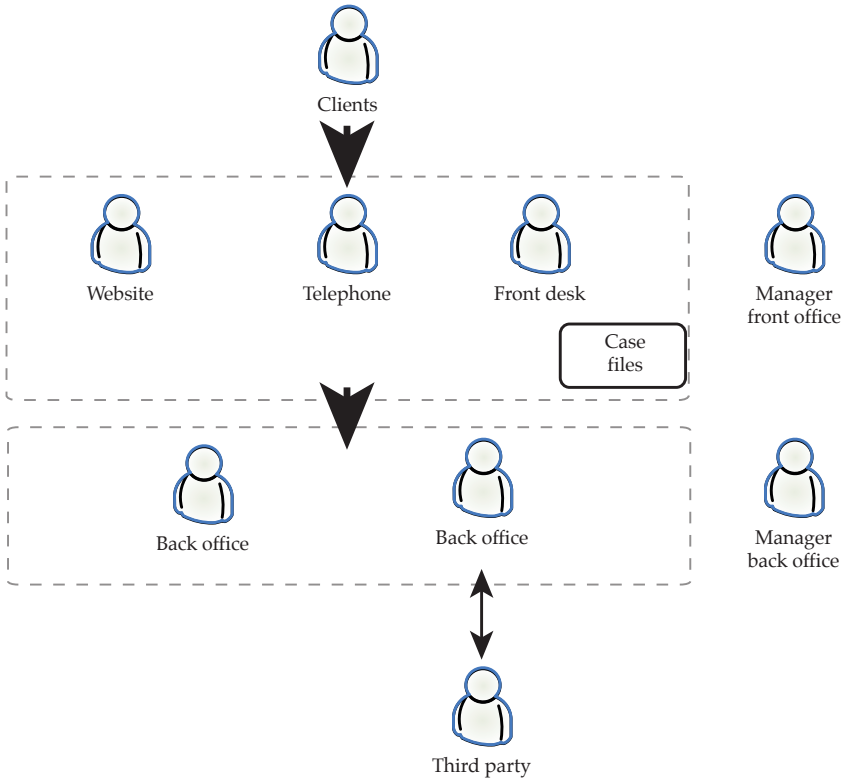

Figure 12: **overall structure of the game**

7.1.2.2 The game sessions

Realism is important for the awareness of the participants as well as for the validity of the results of the game. The generic game design is translated to a use case or scenario that is played in the game itself. Practitioners validate this scenario for realism. For various types of problems or participants, the scenario can be (slightly)

adapted to match the participants of a game session. A specific session can therefore use names of services and for the third party that match the real situation of the organisation that the participants of a session represent.

A game consists of four general phases, an introduction, a round of play (in the first iteration, the current situation is played, in a second round, alternatives can be played), collaboratively identifying the coordination challenge and developing alternative approaches, and evaluating the rounds of play as denoted in **Figure 13**. Note that the play and collaboration phases can have multiple iterations. Our game is designed to have two round of play, where the second round is used to play with the alternatives that were developed in the collaboration phase. Between the two rounds of play, the facilitators present theory on coordination in public-private service networks, as well as the coordination framework.

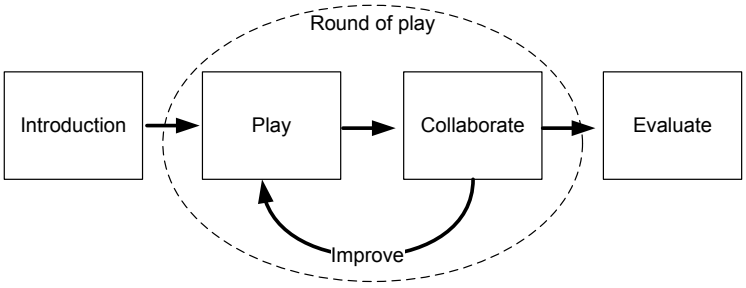

Figure 13: **phases of the game**

In the introduction round, the facilitators briefly introduce the concept of a simulation game and describe the roles that are involved in the game. Roles are divided over the participants and the participants are asked to read through their role description and contact one of the facilitators if something is not clear. After a couple of minutes, a facilitator asks if everyone understands the role he or she has been given. If so, the game starts with the first round.

In a round of play, those playing a citizen pick up an assignment. There are 100 assignments, which contain the citizen ID, information about the channel of preference, the task, and further information needed to complete the task. The people playing a role at the organisation perform their roles according to the description. After a round of playing the game (20-30 minutes), the managers are asked to discuss the way things are going with 'their' employees. The teams can come up with improvements, which are incorporated in a second round of the game. During the game sessions, we have witnessed primarily ad-hoc changes, based on complaints from service consumers and on errors that came up during play. The players have also proven to be creative, as they changed the staffing of channels and departments based on the workload, made slight alterations to processes, and changed the satisfaction measurements. Also, they stressed the need for better management information in

order to adapt service delivery processes to the requirements of the service consumers. One of the changes that the front office team in almost every session make is in measuring the satisfaction of the service consumers. In the initial set-up, those that play a service consumer only indicate whether they are satisfied or not with how their request was handled, or that they thing a service request was not handled at all. In the changed situation, this measurement is often changed to include more gradations in satisfaction and is further specified to cover each channel individually. In the reflection phase, this change is explained by the need of the front office to gather more management information and a better understanding of service consumer satisfaction if they are to improve service delivery.

In the evaluation round the facilitators encourage the participants to compare the rounds of play in order to identify how improvements worked out, which coordination challenges they identify, and how they dealt with them, if they did. We also introduce the coordination framework and ask the participants to reflect on their sessions using the framework. Furthermore, we ask their opinion about the coordination framework. Throughout the evaluation and reflection phases, the facilitators play an important role since they know the content of the roles and the problems that were part of the game. They know the process and hurdles in the game and can trigger a discussion by asking participants (in the order of the process steps, for example) their experiences and problems encountered.

Ultimately, five sessions of the game were conducted in 2009, all of them based on the abovementioned general structure and all of them based in The Netherlands. Two sessions had participants from a large executive government organisation; one was played with a municipality; one session was held with a mixed audience of practitioners from all kinds of organisations (including private); and one session was conducted with a group of consultants. In total there were over 60 active participants.

Detailing every session entirely is not necessary as each of them follow the generic structure above. The primary differences between sessions are different types of service requests and different third parties. Still, for all sessions, the service requests are the 'fuel' of the game. The people playing a service consumer have a general role description detailing what they have to do. The set of questions and requests (the workload of the game) describe a specific service consumer (with a citizen service number, which is a unique number that every Dutch citizen has) and a description of the type of service they request (e.g. request information or change the registration an organisation has about this specific person). The information and service requests were such that they triggered the coordination challenges discussed earlier.

A number of structural interdependencies have been built in the game that are poised to pose a problem for processing about a third of the service consumers' questions and tasks. The precise form of these interdependencies varies slightly per session (as

the situation varies), but on a higher level of abstraction, three main areas of interdependence are included:

- Interdependencies between service delivery channels;
- Interdependencies between departments;
- Interdependencies between organisations.

Through the citizens' questions, these interdependencies and the coordination challenges are made tangible to the participants. For example, changes that are filed electronically (through the website channel) are routed to the back office, which has to process these changes. However, consistent with the actual situation in the public organisations that the participants represented, legacy systems slow down this process. In the game, we represented this in the form of a black box (literally, a black box, but the figure of speech was also recognised by the participants). The actors playing the electronic channel had to put certain files in this black box (e.g. in the game for the Tax and Customs Administration, a new tax application was processed by this 'legacy system', whereas changes in personal information were not), which delays them. After a few minutes, the game facilitator gathers the files in the black box and transfers them to the back office. Some service consumer assignments were a rapid succession – using a different service delivery channel – to an earlier assignment, of which the information was still in the black box. This represents that service delivery channels are interdependent for data. Also, some service delivery channels require information that has to be provided by the back office, which depends – for some data – on a tertiary party. Bottom line is that the interdependencies run throughout the organisation and that the back office basically delivers services to the front office, to enable the front office to provide services to the service consumers. Furthermore, both departments also relied on timely and accurate data from other parties, beyond their control. This dependency is something that is represented on the data layer, but requires the managers of both departments and of the partner organisation to collaborate. This small example thus includes interdependence at the data layer, but also that of allocating responsibilities and a shared feeling of responsibility towards service delivery. This latter was represented by a constraint in the game; the black box could be removed (i.e. the legacy system replaced), but the manager of the back office had a list of other activities that had priority for the back office; the real effect of this black box was felt by the front office, of which the manager had to take this up.

Each session was concluded with an evaluation phase. In this phase, the facilitator triggers the participants to discuss which issues they have encountered and how they dealt with it. Furthermore, the participants discussed how the in-game problems represented the issues in their organisations. We have tape-recorded the evaluation phase of each session. We find that participants think the discussion and reflection

phase (after playing the game) is very important for the translation between the – quite generic – game and the actual situation of an organisation. Without putting the results in the context of the issues that practitioners face, the game results in generic lessons on public service delivery, but participants say they expect to learn what concrete steps to take next. To offer this, the reflection phase is required, as this adds value for the participants and for the researcher as well. Most participants stress that playing the game is necessary to facilitate the discussion phase and to invoke the reflection and evaluation of the current situation of the organisation, primarily because it makes sure that everyone is on the same page. Four participants indicated that the game is too hectic to come to any real solutions, which was the main critique to the game. In one situation, however, this participant was told – by other participants – that in reality you cannot 'pause' your service consumers either.

7.1.3 Overall evaluation and results of the simulation game

When we assess the various sessions of the game, the rounds of evaluation and discussion afterwards and relate this to the coordination challenges we put into the game, a number of findings come up. At least two researchers observed the game and discussed this afterwards in order to identify shared observations and check each other's findings. In the session having the most participants, three researchers were involved due to the higher number of players. These were instructed by the lead researcher through an observation protocol stating which problems could occur during the course of a session. They were also asked to write down any issues they encounter as well as the notable behaviour of the participants.

7.1.3.1 Quick-wins versus solving fundamental problems

Most of the changes that the participants make before entering the second round of play can be considered short-term 'quick-wins'. This can be explained by the participants' desire to improve the results of the second round as compared to the first round of play. The changes are therefore directed towards dealing with the most visible hurdles. A popular strategy within the game is to transfer the burden that these hurdles pose from the service consumer to the service provider. In other words: the front office develops various solutions that are all focused on reducing the burden for the service consumer. This can go quite far; in one session, the front office manager personally sat down with every service consumer that encountered a problem. In another session, some front office employees did this. The result is that those specific service consumers value the personal service delivery, but at the same time, waiting lines appear due to lack of staffing in the service delivery channels, with a negative impact on the overall satisfaction (i.e. the satisfaction of individual problematic cases is increased, at the expense of the satisfaction of others). Also, as the manager in the one session focused on individual cases, there was no time for him

to evaluate the overall performance of his department and failed to identify the structural hurdles and to deal with the interdependencies.

In the evaluation round, the participants indicate that large parts of the game are recognisable to them, especially concerning the issues in service delivery. In their daily practice they also notice that there is more and more focus on integrating services, across departments and across organisations, which blurs the boundaries between departments. In the game, the participants focus on service consumer satisfaction, often at the expense of structure and overview. Combined with the ad-hoc solutions employed in the improvement round of the game, an important lesson for the translation to their organisations is that the participants have to think about the long term developments in the organisational structure, the allocation of roles and responsibilities, the role of the back office, the role of partners in the network, and about the consequences of pursuing quick wins.

A structural approach to these issues only came up as late as the evaluation round, as it was then when we introduced the coordination framework. Based on the framework, the participants identified that although – without exception – they attempted to deal with the interdependence by using the managers as a coordination entity, this requires authority to which others actors do not necessarily answer. The participants overestimated the influence they have on other actors. Using the framework, they recognised that one of the main problems they encountered was due to the lack of a shared information basis in the network. Distinguishing the three layers showed them that the reason for this was not at the level of the data or the interconnectivity with the third party, but was at the organisational level, as they approached the third party in an authoritative way, which did not work. As the framework forces the participants to focus on interdependence, instead of short-term optimisation of customer satisfaction, it enables the participants to get to the underlying coordination challenges which, if not dealt with, may inhibit making fundamental improvements.

Overall, in the various sessions of the game we played, the coordination framework contributes to having participants recognise the dependence they have on other actors for realising the service delivery process. Furthermore, when analysing the issues in the sessions, the framework shows how the organisational tension between the authoritative approach in hierarchy and the autonomy of other actors impacts the other layers. We discuss both these points more extensively in terms of what happened in the game sessions and conclude with a reflection on the game and the use of the framework.

7.1.3.2 Recognising dependence on others

In most sessions, the participants did not seek to contact the partner organisation that was a source of data. If certain data appeared to be wrong or out-dated, the front office typically contacts the back office, and vice versa. The players apparently did not realise that the solution to their problems were perhaps best addressed by discussing them with the source of the data. This inward look results in not finding the underlying problems. An example from the game: in the session designed for a large executive organisation, used multiple times, the service consumers were given to option to have a certain piece of information filled in for them. To facilitate this, the back office had a dataset with citizen numbers and the corresponding information. Using this information, the back office could provide this information to the front office, which in turn could provide it to the service consumer. However, this specific dataset (on value of a home, used as the basis for some taxation) is set-up by municipalities, as they establish these values annually and then transfer this information to the executive organisation. However, citizens can lodge an objection to this. The municipality then processes such objections and, if granted, the value is changed at the municipality. At that moment, an entry in the dataset at the executive organisation becomes out-dated. This problems turns up in a number of service consumer questions, as their assignment describes that they have objected to this value. If that information is filled in for them, they can see that this information is incorrect.

A core challenge of coordinating the game is that the information needed to identify the problem and the interdependencies that underlie it is fragmented over the actors in the game. The sessions show that it is, for the participants of the game, very hard to recognise these interdependencies as they fail to get an overview of all the information that the various players have. The problem only is recognised as such if the managers of the front and the back office start talking to each other, which in some sessions the players failed to do. In the sessions that this did happen, the municipality (the original source of the data) was not included in the talks and the underlying problem (i.e. that in some instances, some values in the dataset change after it is provided to the other party) is not solved. Instead, the back offices contact the data supplier on the basis of individual cases, which takes the back office employees a lot of time, while the role descriptions did allow for more structural changes. In this case, the front office encounters a service delivery problem, but depends on the back office for a solution. The back office, however, has different priorities. Thus, to solve this, choices have to be made. Furthermore, the role description of the municipality told the player of that role that the municipality is not inclined to invest heavily in solving the problem of another organisation, even more so because they often depend on software suppliers.

As each player was focused on fulfilling their own objectives (i.e. their role descriptions), an overview of the dependencies that exist in the entire 'system' of the game was not created. Therefore, all the problems that the players encountered were dealt with within the limited area of influence of the individual players. At most, the issues were discussed at the level of the departments (e.g. the front office department) within the organisation, which resulted in suboptimal solutions. When looking at the situation as a system of interdependent elements, it became clear to the participants that for dealing with a problem that the front office encounters, an integrated solution is required by the entire chain that is involved in the service delivery. Furthermore, the coordination framework showed them that this is not just a question of identifying the interdependencies in the process flow, but that there are also coordination challenges that have to be dealt with at the level of the organisations. The main example of this is the one discussed above; to make sure the service delivery process offers an integrated response to the service consumer containing the correct data, the various actors that play a role have to collaborate at the organisational level in order to make the original data available to the entire network. Focusing on one layer only does not work, as we will discuss next.

7.1.3.3 Authoritative approach and autonomous actors

In the various sessions, different ways to organise the in-game organisation and to coordinate the interdependencies have been tried by the participants. Often, this involved an authoritative, top-down approach. This was primarily visible in the relationship with the network partner that served as a source of data. Important questions came up, for example on which data is needed, where, how and how often the data is exchanged. The decisions here, such as distribution of costs, were primarily made by an authoritative approach, by managers at the service provider. However, the network partner, such as the municipality, were not that inclined to pay for adapting their systems in order to provide more timely updates to the service providing organisation, which requires it for their service delivery. In the evaluation round, the players argued that they thought this very uncooperative of the municipalities, as they would not give in easily. In the translation to their real world situation, they recognised that enforcing their will onto over 400 municipalities in The Netherlands was less viable than their initial reaction indicated. Overall, the game shows that the players overestimate the room they have for the subordination of other actors.

Another result of the authoritative approach is that central, directive coordination was a popular strategy among the managers in the game. This strategy was consistent with the coordinating entity identified in the expert interviews in § 5.1. For the game, this centralised coordination approach works quite well to handle the interdependencies within organisations that allow for a hierarchical approach. The

game also shows that this type of coordination only works insofar the coordinator can handle the complexity (in one session, one of the participants even asked if she could have "less customers"). As the game posed a setting that the players were not entirely familiar with, and as questions from service consumers came up that led to problems, the manager of the front office could not handle the complexity in some sessions, especially if that manager presented him or herself as the overall manager for service delivery, and – as the game is on service delivery – thus also wants some say over the back office and tertiary parties.

The situation with two managers, which was a deliberate design of the game, led to some fragmentation in the organisation and coordination of the system in the game as a whole. Improving service delivery is not a task for one part of the organisation alone; every actor involved has to provide services, if not to the citizen, than to an internal consumer within the organisation or the network. The quality of those individual service components all affects the ultimate quality of the service delivery to the final service consumer. Service improvement is thus not a task for the front office only; they rely on a service provided to them by the back office, which in turn relies on a service they require from a partner in the network. Furthermore, in cases the managers positioned themselves as peers, issues that came up were often regarded the problem of the other. The individual managers also felt powerless in this situation, as they did not clearly define the responsibilities that each of them had, resulting in unclear mandates for each manager.

When it comes to the cross-organisational element, the game clearly illustrates that cross-agency dependencies need to be addressed in order to realise network service delivery. When reflecting on their own organisation, the participants indicated that the coordination framework helped them to understand that actors within organisations and networks also provide services to each other and that the improvement of service delivery is not limited to combining services of multiple actors and offering them to service consumers in an integrated manner, but that the goal of improving service delivery also entails a new way of looking at the way actors enable other actors to provide service to service consumers.

However, the authoritative approach to coordination found its limits when dealing with interdependencies with other actors (i.e. other department and the third party). In the game, these actors have a certain degree of autonomy and have different interests. The issue discussed earlier, on the allocation of costs for changing software at municipalities, has implications for the intentions by an organisation to improve service delivery. They aim to gather more data from the partners in the network in order to reduce the load of information that the citizen has to provide. The situation with the municipality showed them that the implementation of this could be hindered by the fact that they cannot enforce their needs to hundreds of other organisations

that face other challenges. Even in case of shared interests, decisions have to be made on prioritisation. If one organisation has to focus on changing or adding some functionality, they may have to postpone other developments that would – from their perspective – also contribute to a shared goal of improving service delivery.

In conclusion, within a hierarchical organisation, centralised coordination is a viable approach as long as the coordinating entity can handle the complexity. If not, than multiple coordinators is an alternative form. However, all coordinators and all departments have to realise that they all contribute to the ultimate service delivery. In that regard, the game also highlighted a gap between the way that public servants think about service delivery processes (i.e. supply driven, with fragments supplied by departments) and looking at service delivery processes from the perspective of the service consumer (i.e. demand driven). Based on the coordination framework, the participants could see that the latter requires that they think in terms of interdependencies and that they assess their ways of dealing with them on multiple layers.

7.1.3.4 The value of the coordination framework

The coordination framework was used to unravel the coordination challenges, which crossed multiple layers of interdependence. By demonstrating this to the participants, they were enabled to see which dependencies exist in the game setting and how they cover multiple layers. Many participants indicated that it opened their eyes to see that their service delivery process yielded incorrect results, due to the fact that information was not shared properly in the network, which could not be resolved due to the way this problem was addressed at the organisational level (i.e. authoritatively).

Furthermore, we discussed the value of framework itself with the participants of the sessions. As a result, we had over 60 participants, with a shared view on the problem of interdependence in service delivery, assess the value of the framework. Most of these valued the multi-layered approach of the framework. When asked what additional insights it provided them in their translation from the interdependencies and coordination mechanisms found in the game to their daily practice, the participants indicated that it was very insightful that coordination is in fact such a broad concept and that the various layers are themselves interdependent. Primarily the idea that coordination can be focused on e.g. technical interoperability to deal with complicated interdependencies at the socio-organisational level was considered very interesting. They agreed that a vertical approach can in some – very fragmented – situations be so difficult that a horizontal management may be preferable, for example through ownership of data in the network.

One organisation that played a session had high hopes of a new information system that was – at the time of the session – under development. The organisation had a complex organisational structure, with fragmented departments and responsibilities, without a clear allocation of service delivery channels to those actors within the organisation. The situation made it difficult to collaborate even within the organisations. The participants expected that in their situation, the new information system could fix the problems. The multi-layered model offered the additional insight that the information system would only improve the coordination of the interdependencies at the technical level, whereas the organisational challenge would remain. The same applied to their inter-organisational level, which was also primarily seen from the perspective of automation (data exchange in the network).

In most sessions, the participants were quick to focus on process improvements to tackle the problems they encountered in the game. This may partly be due to the background of the participants, but solutions on the other layers (e.g. designing the collaboration with a partner organisation through agreements, instead of only looking at the exchange of data) were not easily considered. The multi-layered framework was valued for its capability to broaden the focus and thereby to open up a perspective on a broader range of solutions for the problems of interdependence by providing a broader picture of that interdependence.

To wrap up, a number of citations from game participants were: "the game…

- … is a good way to really experience serious problems";
- … illustrates the importance of creating an overview over the entire service delivery constellation";
- … enabled me to play a service consumer, which was a very interesting perspective";
- … shows the complexity of coordinating service delivery, even within one government organisation";
- … gives insight in the dependence between multiple actors".

7.2 Demonstrator of an event-driven architecture

In the work re-integration scenario in the explorative case study described in chapter four, we found that the network performs services that have a reciprocal character. In our framework, we describe that the predictability of the line of action affects the way a cross-agency service delivery process in a network can be coordinated. Furthermore, the fact that such networks consist of parties that are autonomous and have their own ways of working further complicates the coordination of such processes. Therefore, we investigate how interdependencies at the technical layer can be coordinated if the sequence of steps is hard to define in advance.

In this chapter, we put the proposition (made in chapter six) on the interwovenness of the organisational and technical levels to practice in a demonstrator of an Event-Driven Service-Oriented Architecture (EDSOA), which provides a way to deal with the interdependence on the level of the interfaces between (technical) components in a reciprocal process flow. We will demonstrate that requires loose coupling to deal with the coordination challenge at the level of the interfaces and we assess how this impacts the other layers in the network. The consequence of this approach is that the very loose technical coupling requires agreements at the organisational level. However, instead of agreeing on what happens within the process steps (the throughput), a major coordination mechanism is agreements (e.g. SLAs) that focus on the output. Thus; organisations have to agree on what they do, not on how they do it.

In this demonstrator, we show how the framework enables solutions, as the technical coordination solution needs to be accompanied with mechanisms at the organisational level. The demonstrator is build for the re-integration scenario, also used in the first case study. The scenario is on a public-private service for unemployed people to re-integrate in the job market, in The Netherlands. A number of organisations are involved in this service, each performing parts of this overall service and each with own processes, systems and structures. The overall responsibility of guiding people to a new job is allocated to the UWV. The UWV delegates some activities that are part of the overall service to other organisations (public and private), like a re-integration bureau (the organisations involved are discussed in § 4.2.1). This bureau, in turn, performs or requests services for matching job vacancies, providing additional education, etc. The UWV is overall responsible. Therefore there is a nested structure of service delivery, responsibilities and operations.

To illustrate the complexity of a demand-driven service, consider the following example of a man who becomes unemployed. If he registers himself as unemployed, he has a number of rights and obligations. He may be eligible for social security benefits, but has to apply for job openings in return. Organisations that may be involved in this process are the UWV, a reintegration coach, intermediaries, the Tax and Customs Administration and a municipality. The organisations involved work in parallel for the same client, while sometimes interacting with other organisations, processes or data, as shown in **Figure 6**.

7.2.1 The need for a loosely coupled technical solution

The coordination of this scenario requires an architecture that accommodates the autonomy of organisations and the decentralised structure of public-private service delivery, while at the same time enabling the coordination of cross-organisational processes.

The delivery of services by a public-private service network requires coordination of the activities of these services executed by the various partners. However, a demand-driven service process is hard to pin down to a full process specification. Different business processes run in parallel throughout the network while interacting with the client and other processes. Together they realise the service towards the client. The service thus consists of a complex set of interactions between the partners in the network. What is more, the organisations involved have a large degree of autonomy, they are often focus on their own activities, and may be reluctant to give up some autonomy to a coordinator in a service network they are part of.

There are many possible variations, and the exact course of services, processes and tasks to be followed is hard to specify in advance. Nevertheless there are several dependencies and constraining rules, e.g. someone must register as unemployed before other steps can be taken. Existing architecture do not support integrated delivery of services for such a highly complex and dynamic situation, without a predictable line of action and involving autonomous or semi-autonomous organisations. Many cross-agency architectures focus on providing a detailed description of business processes and on defining interfaces, which often are "thick" with many information elements. This was also discussed in chapter six, in terms of a reciprocal process flow, which requires that interfaces contain coordination elements. Streamlining these interfaces requires standardisation of the processes involved, because otherwise a system would have to analyse and predefine thousands of processes to enable cross-organisational service delivery, which is not feasible. Therefore, many initiatives targeting integration focus on recurring questions rather than on incidental, nonstandard, or other requests that are difficult to predict and specify in advance. Furthermore, the introductions of new laws and regulations and changes to existing ones require continuous modification of processes and interfaces. This is an overwhelming task, requiring new analyses and often a complete redesign, which hampers modification. Organisations therefore need process execution that is flexible, that can easily adapt to changing circumstances, and that can create customized cross-organisational processes to accommodate such (reciprocal) service delivery.

The type of interactions in public-private service networks resembles what He et al. (He, et al., 2004) call a "conversational message exchange" (3.13). That scenario is defined as: "Two partners are engaged in a long-running process, which involves multiple message exchanges. […] There may be multiple instances of the same process in progress between the same two partners" (He, et al., 2004).

This kind of conversations typically consists of a set of coordinated Web service requests, which together make up a higher-level service (a business service, not a web service). The model for coordinating these interactions should consist of the following

elements: 1) the contractual and responsibility relations among the service partners and between the service providers and the service consumer, (2) the operational coordination of their (parallel) service delivery processes, (3) the interactions among the service partners and between the service partners and the service consumer, and (4) the internal processes in which those interactions take place.

In the coordination of a network, agreements and contracts that specify the relationship between the partners are an important part, especially between public and private organisations (Pongsiri, 2003). Also, the coordination solution should respect the relative positions of the organisations by being as loosely coupled as possible. The clear allocation of responsibilities is important in public-private service networks, for example by assigning roles (Janssen, et al., 2006). This requires agreements on the use of standards and interactions, as well as contracts on how to deal with private information, responsibilities, payments, etc. By connecting to the network, service partners agree to those contracts.

Typical inter-organisational orchestration solutions with, for example, WS-BPEL technology, specify a workflow in which a complex service is configured from a set of basic services (Recker & Mendling, 2006). In the re-integration scenario we found that this type of full process specification is incapable of covering the complexity of demand-driven processes. The service network in this case required a high-level cooperative process that does not need to be fully specified in advance, but that is more or less emerging from a specific case. Once the exemplary unemployed man became unemployed, several organisations needed to start doing several things. From the organisation perspective, they may run separate processes, but for the service consumer it is all part of a greater service he requires.

Therefore, rather than looking to standardise and create interfaces, we need an architecture that relies on decentralised intelligence, which agencies use to process events. The architecture replaces thick interfaces with events, which trigger organisational activities. This creates the flexibility necessary to adapt to changing circumstances and makes it possible to generate new process flows by a sequence of events. Nevertheless, the system still needs to share information for managing and orchestrating the dependencies among organisations. Ontology can be used to describe this information; its semantics create a database containing and capturing the necessary business information about the agencies (such an ontology for public service delivery is described in: Overbeek, et al., 2009). In this database, government organisations can register, modify, and remove their business information and other characteristics described in the ontology. The information stored in the ontology can be used to manage a cross-organisational process that matches specific requirements, thus enabling customisation. After each step, the ontology makes it possible to decide on a possible next step, which increases adaptability compared to hard-coded, rigid

business processes. The ontology captures the information needed to identify which services are needed where in the cross-organisational process, so that the various agencies can generate new events on the basis of the previous steps. Dispatching the events that play a part in that greater service is a way to inform and initiate service partners to play their part. For example, if the UWV publishes the event that our exemplary man is unemployed, intermediaries might start looking for job vacancies, while the re-integration coach sets up a profile for additional education.

The basic type of interactions in architectures ('request-response') should be therefore be extended with events (i.e. a 'publish-subscribe' mechanism) to facilitate flexible, demand-driven processes. If the unemployed man from our example moves and changes his address in a personalised portal, the portal can broadcast the event that he has moved. Other organisations and applications that are subscribed to this type of events can assess whether they want to collect the new address data. If so, they can just start a regular process that requests and updates this information. This way, events are independent of how organisations process them. The purpose of events is to coordinate a high-level business process, by adding thin information flows and simple interactions. This poses is a flexible solution that allows coordination from a demand-driven perspective on service delivery.

7.2.2 Event-driven interactions

Standard service-oriented architecture (SOA) solutions for coordinating inter-organisational processes fail to address the distributed nature of service networks, and often focus exclusively on coordinating standardised processes that can be fully specified in advance. We therefore extend SOA with the use of events to coordinate demand-driven services across a network of organisations by developing, thereby creating an event-driven, service-oriented architecture (EDSOA). The architecture communicates events to allow flexible and loosely coupled interactions between autonomous organisations.

Due to the unpredictability of the process flow, changes in regulations and the autonomy of organisations (many organisations are hesitant to depend on other organisations for their operational process execution), the interaction process requires a mechanism to coordinate the organisations' technical responses flexibly and in a way that matches the service network's fragmented structure. The complex set of interactions requires a very loose coupling between various parties, which means that we must expand the customary linear request-response interactions to facilitate events—for example, via a publish-subscribe mechanism. In such a mechanism, the basic building blocks are events, which can be defined as a state change resulting in a notable occurrence at a particular point in time. Events serve as a communication vehicle to inform or instruct. Individuals or businesses generate some events (e.g. becoming unemployed, by marrying, or applying for a residence

permit). Organisations involved in service delivery generate others (by completing a process, for example). Events can notify relevant parties of a change in information, but they do not contain the information itself. This is visualised in **Figure 14**. This figure shows vent-initiated interactions, with and without a broker. The organisation publishing the event either distributes the event among the organisations that have subscribed to the event type (1), or sends it to a broker (3), which distributes it (4). The event subscriber determines whether it needs to act on the event; if so, it initiates a service call to the publisher (2).

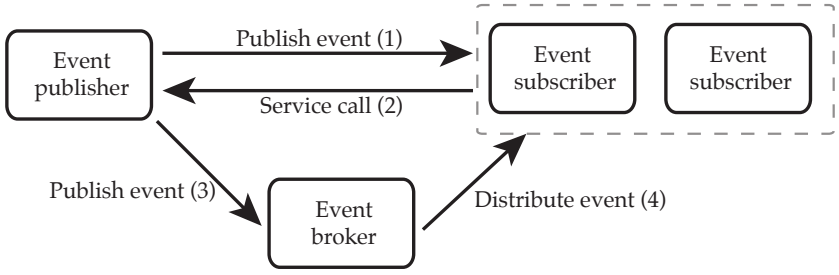

Figure 14: **event-initiated interactions, with and without a broker**

Organisations can subscribe to certain types of events and can be informed when these events take place. An event is typically a service request by an individual or business, but it can also be initiated by other organisations (for example, when an object's state changes), or it can take the form of an annual trigger. When an event occurs, organisations must determine whether and how to deal with it. If they respond, they must identify the activities and processes that are necessary to process the event. The distributed architecture integrates the activities of several public and private organisations and provides the flexibility to deal with unanticipated questions. In other words, the architecture gives organisations a flexible way of supporting service delivery processes driven by the demands of individuals and businesses.

The combination of events, the rules to process them, and the services designed to handle the follow-up creates a flexible mechanism for orchestrating cross-agency service delivery. Because this is only a technological tool enabling interaction, it must be accompanied by contracts and service-level agreements (SLAs) to create the necessary coherence at other layers. Even though events are discretionary in nature – which is one of the main ways this setup respects the autonomy of the organisations involved – follow-up may be mandatory. For example, the government organisation that receives and verifies an address change may at its discretion notify other government organisations of this change. However, the follow-up that is mandatory for such an organisation is to provide the central administration with the verified

address so that it can update the address in its records. Nevertheless, organisations can continue to use their own systems and architectures. On top of that, an event bus connects the organisations, and portals or applications fire and signal events. Organisations connect to the event bus, register relevant events, and then act on them. This can involve processes that directly interact with other organisations.

Apart from respecting the autonomy of the organisations involved, one of the main advantages of the event model is that all the steps do not need to be fully known or specified in advance. Orchestrating in EDSOA does not specifically dictate to each individual organisation what to do and how, it only distributes the events. How to respond to that event is left to the decentralised organisations. The very loosely coupled nature of event interactions requires the orchestration and monitoring of the process execution to ensure that at least the necessary steps are taken and that the process is finished in time.

7.2.3 Demonstrator and validation

To evaluate the feasibility of the EDSOA model, a demonstrator was developed based on an extensive usage scenario with the description of the various parties involved in the re-integration case, as well as the case of the unemployed man. A part of this scenario was implemented in a set of event-driven applications, each representing a party in the network. The demonstrator needs to accommodate the second archetypical situation based on the coordination framework, as identified at the end of chapter six: a reciprocal process flow, with a loose technical coupling and respect for the autonomy of the actors involved.

In the demonstrator, organisations subscribe to an Event Bus and a citizen registers at the UWV as unemployed using a personalised portal, such as described in chapter four. Other interactions that were implemented with events are assigning a re-integration bureau to the service consumer by the UWV, entering a new vacancy in the personalised portal and changing the service consumer's address. The functionality of each of the parties involved in the demonstrator is implemented by means of web service technology, as is the Event Bus itself; further illustrating that events-driven architecture does not replace service oriented architecture but is an extension to it. The demonstrator thus consists of five independent web services that interact by means of events. Each service is fully functional and can be deployed in a distributed fashion.

The demonstrator shows that event-driven interactions are technologically feasible using existing and widely adopted and available Web services technology. Note that even the Event Bus itself is implemented as a Web service, allowing it to interact with other services using the standard adopted by industry. Furthermore, in the event-driven model, the contractual and responsibility relationships between the service

partners are implemented in contracts to which the organisations comply when 'plugging-in' the service network. The operational coordination of the (parallel) service delivery processes consists of two layers; the overall business service, which coordinates lower-level services by the means of events and agreements. Interactions among the service partners and between the service partners and the client are handled by events. In the second layer, internal processes that disseminate events and interact with others in a predictable way are the responsibility of the organisations themselves and can be coordinated by whatever means fit, including Web service choreography and orchestration.

7.2.3.1 Validation by experts

Both the concept of event-driven coordination and the technical implementation in the demonstrator have been presented and evaluated in two expert panels and by one independent government advisor. The panels each included eight experts from government, consultancy and academia and covered both the technical and the business disciplines. Using events as a solution for flexible, complex public-private service networks was perceived as a fitting and innovative solution for such networks.

However, experts expressed concern for coupling too loose on the agreement level. This indicates that the loosely coupled coordination mechanism should be accompanied by control through agreements. This validates our idea that coordination exists on multiple layers that are interdependent.

Also, it was felt that this innovation should clearly be extending existing solutions. By using widely adopted standards, the demonstrator meets this requirement. It should be kept in mind that this is a solution to the situation in which a process cannot be fully specified in advance. The solution presented here was designed to overcome those issues in flexible complex networks that traditional coordination mechanisms could not overcome.

A final remark one expert panel made was that this solution does improve flexibility and demand-orientation, but does not necessarily ease the process of integrating the various parts of a business service. Furthermore, large-scale implementation requires the consideration of political processes of coming to agreements, the connection to existing systems and possible resistance to change in organisations. Although the coordination framework was deemed useful for identifying such challenges at other layers, experts were afraid that in some situations the challenges of readying the network for such developments would be greater than dealing with the coordination challenges in other ways.

7.2.4 Conclusion on demonstrator of an event-driven architecture

Demand-driven, integrated and personalised service delivery does not necessarily lead to sequential and predictable processes and thus requires flexible coordination mechanisms. In this section, we show that event-driven and service-oriented coordination enables this. Our model goes beyond traditional solutions for inter-organisational processes that are based on fully specified process steps. A full process specification that is the basis for existing coordinating technologies does not leave enough room for the flexibility required for reciprocal situations that may occur in public-private service networks. Event-based interactions do fit the need for demand-driven service delivery. It also fits the organisational reality of collaborating organisations in networks since organisations can determine for themselves how they process events. The demonstrator was used as a proof-of-concept and shows that EDSOA for creating flexible service networks is technically feasible.

EDSOA is a promising direction as it takes into account the local autonomy of organisations. Its implementation poses challenges for both the technological and organisational level, including the implementation of some kind of event distribution mechanism (e.g. a broker or event-bus) and proper agreements between organisations that connect to this mechanism. Each organisation should be able to deal with the events and react to them appropriately. Workflow and Web service orchestration are especially useful for well-defined and standardised processes. EDSOA is an extension for dealing with complex, unstructured questions that result in service delivery processes of which the process flow cannot always be predicted in advance.

7.3 Wrap-up: the coordination framework in practice

The coordination framework that serves as the answer to the first part of research question four (RQ4a) provides a way to assess and differentiate coordination in public-private service networks. As such, in chapter six the framework is primarily a descriptive model of coordination in public-private service networks. This became clear in the game, where people experienced problems and using the framework they identified coordination challenges on multiple layers as the underlying issue. Apart from using the coordination framework for analysing coordination issues, we developed a demonstrator to show how the framework can be used to deal with coordination challenges in a public-private service delivery process. The demonstrator shows that for reciprocal process flows, the interfaces between process steps can be made very thin in order to accommodate the flexibility needed in the process flow. Using the framework, we see that this increases the coordination challenges at the organisational level. In situations where autonomous actors are able to collaboratively deal with these coordination challenges, the burden of coordinating

a cross-organisational service delivery process can thus be transferred from the links between steps in the process to the organisational level.

The interchange between the technical facilitation of the network and the need for accompanying agreements to make sure service process are in fact realised, illustrates our finding that there are not just interdependencies at these various layers, but also between them. This finding was supported in our assessment of the coordination of public-private service networks in practice, discussed in chapter five. Primarily the interviewees working in federal systems indicated that in situations with very fragmented layers of government and socio-political hurdles to coordinate between organisations, there were deliberate choices to coordinate at a lower layer, in that case the data layer. Too narrow a view could mistakenly interpret this situation as simply coordinating the data, but using the coordination framework, we can identify what this really is: a way to deal with a coordination challenge that could not be dealt with at the other layers.

In the demonstrator, we have seen that the organisational setting may inhibit much coordination on the process level, as that would interfere with the autonomy of the organisations. Therefore, the event-driven architecture enables coordination on the level of the interfaces between the technical facilities that the organisations have in place. However, the coordination framework shows that although this is not a technical problem, it has consequences for the agreements that have to be made at the organisational level. These agreements need to accompany the loose coupling at the technical level, which was a response to a cross-organisational process issue in the first place. Thus, the organisational and technical levels are highly interrelated. Without a multi-layer perspective, this could have been missed and the solution would not have worked, for example because it would coordinate at a process level, which may result in resistance as organisations see their autonomy threatened.

Other conclusions that can be drawn from the study of the coordination in practice include the coordinating entity identified in the interview series. This entity (a department) was given the formal authority to coordinate almost everything that had to do with the delivery of services to citizens. As such, even within an organisation, it had to deal with interdependencies between multiple service channels, as a wrong formulation in a letter sent out to hundreds of thousands service consumers would result in additional questions for the telephone and front desk channels. But also the dealing with legacy IT systems was part of the coordination task, as was dealing with differences between the front and the back office, and between the IT and the business. We put this authoritative coordination approach to practice in the simulation game and found that the complexity of the interdependence can be overwhelming for the coordinator. In that case, the coordinator fails to coordinate.

Another conclusion from that same chapter is that the leading organisation in the RDW case study functions so well because it addresses all the coordination challenges at all three levels we identified. As it uses private parties for most of its interactions with citizens, this case was one of the best instances of a public-private service network we found. However, instead of relying on the formal authority it has, the leading organisation had the role of coordinator awarded due to their initiative and collaborative attitude. A collaborative stance, an open attitude, clear communication, involving partners early on, also in change processes, have all contributed to the way the leading organisation is able to coordinate the network. In fact, it provides both public value and coordination by similar mechanisms, such as being a reliable partner that sticks to agreements. This is a very important way of dealing with coordination challenges such as varying interests, but is also a value in itself. In the game, many players failed to take such a collaborative stance, and used authority to approach partners. As these partners did not answer to such authority, some coordination challenges could not be resolved.

The coordination framework formalises our findings in a multi-layer model that unravels the coordination challenge and can be used to assess how public-private service networks coordinate. In the model, the key findings are represented. For example, both literature and the empirical studies indicate that public-private service networks pose a complex multi-actor situation, with various stakeholders, autonomous actors and different and potentially conflicting interests. Especially in dealing with private organisations, this impacts the applicability of coordination mechanisms.

Also, the type of service delivery process (sequential or reciprocal) that runs throughout the network impacts the applicability of certain coordination mechanisms. In processes that are sequential in nature, the coordination can be aimed at systemising the cross-organisational process, whereas in reciprocal processes the total process is less predictable and the interfaces between the steps become the focal point of coordination in the process.

The coordination framework was discussed with the experts, including participants in the simulation games and expert assessors of the event-driven architecture demonstrator. They found it very insightful and useful, for example on the idea that coordination at one layer can deliberately be used to deal with a challenge at another. Vertical coordination can – in some fragmented situations – be so difficult that it might be preferred to coordinate horizontally, for example through ownership of data in the network.

In the simulation game, we found that participants overestimate the extent to which they can influence or control other actors. Perhaps this can be related to cultural factors in the public sector, as a hierarchical approach is what they are used to. This

means that organisations and people working in them have to develop the capabilities to operate in public-private networks.

Furthermore, the game clearly shows that improving service delivery is not something that can be realised by one part of an organisation or network, but that every actor involved provides services. Perhaps these services are not directed at the ultimate service consumer, but at an internal service consumer or a partner in the network. A focus on service delivery, also between actors in the network, is necessary to ultimately realise integrated service delivery to the service consumer.

8 Conclusions and discussion

"Finally, in conclusion, let me say just this"

- Peter Sellers -

This research is rooted in developments in public service delivery. The traditional way of public service delivery received critique from scholars and practitioners for being too fragmented and driven by supply instead of actual service consumer demand. Governments now aim to offer integrated services, in which the boundaries between information systems, departments, and organisations are no longer a burden for the service consumer, but are dealt with by the service providers (see also Klievink & Janssen, 2009b). In chapter six, we described this development as shifting the decoupling point between the process of the service consumer and the processes of the service providers in favour of the service consumer. This means that fragments of service delivery that in a non-integrated situation have to be identified, selected, and requested by individual service consumers, are integrated into an overall service delivery process, offered by the joint service providers. As service consumer processes also cross the boundaries between the public and the private sector, both public and private service providers have to collaborate. In chapter three, we have argued that such a network of public and private service providers consists of many elements, including the organisations themselves, but also processes, information systems, and data. Collaboration between parties brings with it interdependence, which was defined as the extent to which the elements in the public-private service network have to work together in order to enable the network to function, which in this study means the ability to offer integrated services. In answer to research question one ("which elements of interdependence are useful to assess coordination in public-private service networks?") we found that the three layers – organisations, processes, technology – we identified in chapter one are useful to describe and analyse public-private service networks in terms of interdependence. They present high-level interdependent elements.

To realise integrated service delivery, the interdependencies have to be coordinated. However, both in literature and in the first explorative case study, we found that making the elements in a public-private service network working together gives rise to challenges that make the actual coordination of these interdependencies hard: the coordination challenges. For each of the three layers, the coordination challenges we found are presented in **Table 1**. Our search for the coordination challenges in public-private service networks was a response to research question two ("what are the coordination challenges in public-private service networks?"). For each of the interdependent elements, we discussed the difficulties of coordinating those

interdependencies. These coordination challenges are discussed in § 4.3. We discussed the conclusions for research questions one and two in the last section of chapter four (§ 4.5). The main conclusion for those two research questions is that the multi-layer view we set out with in chapter one enables us to find coordination challenges for each of those layers, whereas the literature discussed in chapter three either takes a very high-level view or focuses on a single level. Furthermore, the findings suggest that the multiple layers are interwoven themselves. Both the inventory of interdependence and the coordination challenges thus show the usability of the three layers and the interrelationships between those layers.

The interwovenness between the layers was also found in the RDW case study. Together with a series of independent interviews, this study was conducted to research how these networks are coordinated in practice, in answer to research question three ("how is a public-private service network coordinated in practice?"). In the interview series, we search for coordination strategies, by which we mean general approaches to dealing with coordination challenges. In the RDW case, we investigated a comprehensive set of coordination mechanisms employed in the network. That case describes in detail how the network deals with the coordination challenges it faces. The RDW case thus demonstrates the interwovenness of the layers of coordination by showing how mechanisms can be found for all layers and that these mechanisms are closely related. On the other hand, the interview series shows that a focus on one of the layers can also avoid having to deal with coordination challenges on another layer, so networks can coordinate by dealing with the interdependencies at a level that brings less potential conflict. In that way, the coordination mechanisms are not a comprehensive set across the layers, but the layered perspective is also essential to see how the coordination challenges are (or can be) dealt with.

The overall conclusion related to the findings to these three research questions is that a multi-layer view on interdependence is necessary to see the coordination challenges that the interdependencies in a public-private service network bring and to analyse the coordination mechanisms used to address these coordination challenges. In answer to the first part of research question four ("what framework can unravel the complexity of the interdependence in public-private service networks?") we put the findings of the first three research questions in a multi-layer framework of coordination in public-private service networks. This framework is a tool to unravel the complex challenge that the coordination of public-private service networks is and thereby addresses the gap that in literature, the coordination of the collaborative operations of public-private service networks has received scant attention. We started with three layers, but found that these did not capture all the detail needed; therefore more levels were added. A total of nine sub layers represent the complexity that exists within the layers. **Figure 10** shows these layers; the horizontal arrow represents that the interdependencies between the actors in a public-private service network exists

at all of these layers. The vertical arrow indicates that the layers are themselves interdependent. This is the reason why in some networks, the coordination is focused on one layer only in an effort to deal with coordination challenges at other layers (see § 5.1). The conclusion that can be drawn from this framework is that such a multi-level analysis is needed to assess the coordination in public-private service networks. Even though in practice the coordination mechanisms are a comprehensive set of tools, seeing how those tools address the coordination challenges requires that these are unravelled. Unravelling the interdependencies requires the analysis on multiple levels and considering the dependencies not only within those levels, but also between the levels.

To evaluate the framework beyond the explorative case studies it was based on, we put the framework to practice in two steps, in answer to the evaluation part of research question four (what insights are gained when using the framework to unravel coordination?). This does not only illustrate that interdependence in public-private service networks is a complex phenomenon that exists on multiple layers, but that also these layers are interdependent amongst themselves. We found that the coordination of the organisational interdependence and technical interdependence are out of sync (see also Overbeek, et al., 2009). Based on the combined findings for the individual research questions, discussed in the last sections of the individual chapters, and the results of putting the framework to practice in chapter seven, we draw three overall conclusions: first, we conclude that public-private service networks are not a separate form of organisation, but include both hierarchies and markets. In this conclusion, we affirm the second theory proposition made in the conclusions of chapter three. Second, we discuss the conclusion that the interdependence in public-private service networks can be unravelled using a multi-layer framework and thereby affirm the first theoretical proposition. The ordering of these conclusions is for the sake of readability, not priority. Third, we conclude that unravelling the interdependence enables us to see that the different layers in the coordination framework are themselves interwoven. Finally, we discuss the limitations of this study and – as no research endeavour is ever finished – provide suggestions for further research.

8.1 Public-private service networks: both market and hierarchy

The concept of networks was used to typify the inter-organisational relationships between partners in public-private service delivery. In literature, networks are here seen as a generic form of organisation that uses mechanisms such as trust, mutuality, consensus and community (Adler, 2001; Madhok, 1995; G. F. Thompson, 2003). Although networks are the organisational form of the collaboration between public and private organisations as argued by literature on developments in public service delivery, the concept of networks is still subject of debate. Podolny and Page (1998)

argue that networks are distinct from market forms of organisation in that networks pursue repeated and enduring relations, whereas in market relationships are formed for specific transactions. Borgatti and Foster (2003) illustrate the complexity of the concept by describing the discussion on whether a network is an intermediate form between markets and hierarchies or a new and unique organisational form. Some literature (e.g. Powell, 1990) stresses the unique characteristics of networks. This research contributes to the debate in the literature by revealing that public-private networks are not a unique organisational form; in public-private networks the two types of organisations involved (public and private) bring in both hierarchy and market forms of organising. For public-private constellations, networks are thus not completely separate from hierarchy and market, but the three exist together. We agree with Van Dijk (2006), who states that practice involves combinations of these three ideal types.

This conclusion is founded in the differences between public and private organisations. This difference is primarily found in the way public and private organisations deal with the *inter*-organisational level, as the way organisations deal with the *intra*-organisational level does not necessarily differ much since both often have comparable degrees of formalisation (Rainey & Bozeman, 2000). However, the way that organisations govern their interactions with other organisations differs. Thompson (2003) describes the structure of the public sector (comprising multiple public organisations) as being governed by hierarchy, with mechanisms such as command or authority, whereas the inter-organisational interactions in the private sector are marked by market mechanisms, such as price, contracts and competition.

Within our cases, these two basic forms of organising – hierarchy and market – come together and are combined with network characteristics. In the conclusions of chapter three, we proposed that this may clash, as the public and private organisations have a different way of dealing with other organisations. The public sector is traditionally attributed hierarchy as the basic form of organising, with command and authority as its main mechanisms (Albrow, 1970; Ho, 2002; G. F. Thompson, 2003). Public organisations are thus equipped to function in a multi-organisational system of hierarchy and authority, whereas private sector organisations operate in a market environment of competition and the risk or possibility of opportunism. Whereas theory on networks sees it as a distinct form of organisation, often between hierarchies and markets, in this research we found that in public-private networks hierarchy and market do not disappear, but all ideal types are present. Consequently, for this type of networks, literature that sees networks in terms of its own form provides an incomplete picture. This was most visible in the RDW case study.

The cases show that in public-private service networks, hierarchy and market mechanisms may provide conflicting directions to the organisations using one of them

to deal with the inter-organisational situation. For the private parties, bureaucratic rules and authority is a problem, for example as it infringes their autonomy. Furthermore, a public value like transparency conflicts with the private sector interests of not disclosing information to (potential) competitors. On the other hand, the public parties have to warrant public values such as accountability and transparency in a network combining both types of organisations.

A typical and easy to explain example found in our cases is the relationship between the RDW and the insurance companies. The basic vehicle registry is a basic infrastructural facility in the Dutch government and relies heavily on the quality of the data. As described in the case study (§ 5.2), much of this data is provided by businesses in the private sector. Among the data providers are insurance companies, as vehicles on the Dutch roads have to be insured and whether a vehicle is insured is registered in the RDWs registry. Therefore, the insurance company has to notify the RDW within 28 days after issuing an insurance policy. However, as the insurance companies are focused on sales, notifying the RDW to preserve the accuracy of the information in the registry does not have the priority of the companies and as a result, the notification is not always submitted in time. Consequently, the data registry contains incorrect information, which impacts the other actors that use this registry. This is where the two core modes clash in a network: for the insurance company, it is important to compete with other insurance companies and thus focus their efforts on their core business, at the lowest price possible. On the other hand, for the government organisation (the RDW, in this case), it is important to maintain and ensure an up-to-date information basis for the network, on which other network partners and society in general can rely. The ministry is the ultimate authority for them and this task is allocated to the RDW. Due to differences in the basic form of organising, they have different interests and responsibilities towards different types of stakeholders. As they collaborate in this network, such differences manifest in problems as described here.

Similar manifestations of the conclusion that public-private service networks are not a separate form, but also bring in hierarchical and market components are found in other cases as well. For example, in the first case study (described in chapter four) we found that the network often comprises departments of public organisations and not the organisation entirely. As that case study dealt with an electronic portal, the consequences of this were found in the automation efforts. The network logic would require departments to focus on supporting cross-organisational processes and technical interfaces to interconnect their information systems and data with that of other actors in the network. However, the fragmented information systems within an organisation are often addressed authoritatively – within the hierarchy of the organisation – and thus departments have to focus their processes and ICT on the rest of the organisation, not on the partners in the network.

This research concludes that public-private networks are not an organisational form separate from markets and hierarchies, but the forms are present in combination. As the three basic forms discussed in theory – networks, markets, and hierarchies – provide different generic coordination mechanisms (e.g. trust, price and authority, respectively), this research contributes to this literature that all these mechanisms are present in public-private service networks and that potential conflicts can be traced back to the different basic form of organisation that public and private parties have. This is also where public-private service networks are distinct from some other types of public-private relationships. In such relationships, contracts are often very important to connect the market to the hierarchy. However, in a network, if something goes wrong in the operations, "waving with a contract does not solve the problem", as one of the interviewees put it. The network requires collaboration, next to mechanisms able to deal with the still present hierarchy and market ideal types.

8.2 Unravelling interdependence using a multi-layer framework

The research problem we started with is that there was limited insight in what should be coordinated to realise service delivery by public-private service networks, and how. In our exploration of the coordination challenges and mechanisms this was confirmed. When looking at the forms of coordination that the abovementioned three basic forms of organising provide, even the finding that all forms should be taken into account does not provide concrete insight in how the interdependencies in public-private service networks are coordinated. As we found in chapter three, theoretical views on coordination are either too high-level or too narrow to assess the complexity of the coordination challenge in public-private service networks. Therefore, in answer to research questions one, two and three we explored the interdependencies and coordination in public-private service networks and based on these findings we have drawn up a multi-layered framework. In chapter one we identified three layers: the organisational setting, cross-organisational service delivery processes, and the use of ICT. These layers were used in our empirical studies and we found that this was a useful distinction to unravel the interdependencies in public-private service networks and therefore these three layers also form the basis of the framework. With the framework, this dissertation fills the knowledge gap on the lack of understanding of coordination in public-private service networks.

This knowledge gap was captured in the first proposition. This proposition from the theoretical chapter was that current coordination approaches were either too high-level, or too narrow. In our research, we find that this proposition is true. We illustrate this for the high-level approach first. The previous conclusion in this chapter tells us that public-private service networks combine actors that are equipped with mechanisms to deal with a hierarchical environment and actors that are equipped to operate in a market situation. In the literature, it is argued that hierarchies, markets

and networks are also forms of socio-economic coordination and governance (G. F. Thompson, 2003). The mechanisms to actually coordinate in these three basic types vary. Hierarchies coordinate by administrative means including rules, bureaucracy, routines, command and authority; markets coordinate by price, competition and contracts, with relationships focused on specific transactions; finally, networks coordinate by trust, mutuality and more informal mechanisms such as personal contact and loyalty (e.g. Adler, 2001; cf. Chisholm, 1989; Podolny & Page, 1998; Powell, 1990; G. F. Thompson, 2003). Whereas the literature proposing public-private collaboration for service delivery stresses the importance of the collaboration itself, we argued that generic concepts of collaboration and trust are too high-level to respect the complex interdependencies that arise when multiple actors are involved in joint service delivery.

In our research we find that for the coordination of inter-organisational interdependencies, generic coordination mechanisms such as trust and collaborative relationships are indeed important in public private service networks. This was also found in the cases, where most interviewees stressed the importance of a collaborative attitude towards network partners. However, neither trust nor a collaborative attitude alone provides concrete directions for dealing with the interdependencies that result from repeated interactions, which support both individual and joint functionality and that use shared resources. For example, in the RDW case study, the interviewees stressed the importance of a collaborative attitude of the RDW towards the partners in the network. However, the RDW has interactions with thousands of companies in the vehicle industry, which – in 2009 – changed the ownerships status of vehicles in the RDWs registries about three million times and registered an APK check (on the technical state of a vehicle) of about seven million vehicles (RDW, 2009). The collaborative stance attributed to the RDW is accompanied with – amongst others – the accreditation mechanism, and with procedures to monitor, spot check, and – if need be – sanction the accredited companies. Arguing that such organisational arrangements are primarily coordinated by generic mechanisms such as trust (cf. Adler, 2001) is too limited a view to identify the entire set of mechanisms in place to deal with the interdependencies in complex arrangements of public and private organisations providing joint services, as they also include other layers, such as processes, technology and data. The general notion that e.g. building trust and other informal mechanisms are very important does not yet provide any concrete answers to how the envisioned public-private service networks can coordinate the interdependencies that arise in their joint activities.

To understand the coordination between the actors in public-private service delivery, we also included literature on specific mechanisms to deal with interdependency at the operational level of cross-organisational service delivery. In the literature on coordination, this is often dealt with at the process level. In their work on

coordination, Thomas W. Malone, Kevin Crowston, and colleagues primarily focus on the dependencies between activities and resources in a process (Malone & Crowston, 1994; Malone, et al., 1999). This view on coordination could be used with respect to the process steps in – for example – the social support scenario in the first explorative case study. The steps described in § 4.2.2.3 can each be considered activities, which provide output that in turn is input for a next step. Also, these steps make use of resources, for example the shared case file on an individual service consumer. However, whereas this view is specific enough to lead to conceptions of business process orchestration in electronic service delivery (e.g. Janssen, et al., 2006), we find that it is also too narrow. This finding is supported by the cases. In the interview series, a Belgian situation was discussed which would fit the idea of a shared resource and activities pertaining to the brokerage of the information (which is the shared resource). However, the activities of the organisation in question are defined by the fragmented political landscape in which it is situated. Also in the first case study, the idea that a cross-organisational process flow can be orchestrated into execution authoritatively fails to respect the autonomy of the other actors.

There is also literature focussing on other individual layers. For example, work on public-private partnerships also discusses the management of a shared project (which may bear resemblance to the contractual relationships common in markets). Also the work on networks provides mechanisms. For instance, Milward and Provan (2003) provide a discussion of mechanisms that focus on the relationships between the actors in a network. However, the same argument we make against coordination theory applies here as well: a focus on a single layer does not see the interdependencies that exist on other layers nor the effects of those interdependencies and matching coordination employed on other interdependencies. For example, the idea of clear principal-agent relationships (Milward & Provan, 2003) was also the view of a number of participants in the simulation game; who assessed the collaboration with third parties a relationship in which their organisation was the principal delegating work to agents (cf. Eisenhardt, 1989). However, these third parties are autonomous and the game participants overestimated the extent to which they could tell these third parties what to do. This is not just an organisational or cultural issue; the background of the prototype (§ 7.2) was based on the finding (of the first study) that organisations have their own ways of working and have their own information systems, which may not meet the requirements of the organisation or coalition leading the network. Therefore, an overestimation of the influence an actor has over others may also lead to issues in the interconnectivity of information systems.

Based on the findings of the four research questions and related to the first theoretical proposition, we conclude that a single-layer view on coordination does not capture the complexity of the interdependence in public-private service networks. Process

coordination does not respect the relationships between the actors and the autonomy of the organisations, and relationship coordination does not respect the challenges of dealing with a variety of information systems, a multitude of data and the automation of process step sequences that are hard to predict in advance.

We found that using our multi-layer perspective on interdependent elements enables the identification of various challenges as a coordination challenge. Our search for coordination challenges at the level of the network of organisations, at the level of the cross-organisational processes, and at the level of data and information systems yielded a number of coordination challenges that are important to take into account when coordinating public-private service networks. As the quote by Margaret J. Wheatley (heading chapter six) indicates: nothing exists in isolation or independence. The coordination framework reflects this finding that coordination challenges and mechanisms are found on multiple layers and cannot be understood independent of each other. As such, the framework reflects that collaborating organisations that rely heavily on ICT require a more differentiated view on coordination; joint service delivery requires intensive collaboration and alignment on all levels. In chapter seven, we evaluated the applicability of the multi-layered view in practice and have illustrated in a prototype that technical solutions do not necessarily require that a coordinating entity has something to say about the information and systems architecture of others, but can also focus on the interactions alone (as illustrated in the event-driven architecture), thereby respecting differences in how organisations technically handle the rest. The coordination framework helps to unravel the interdependencies, illustrates that coordination challenges are related to multiple layers, and can be used to assess how public-private service networks coordinate.

In the framework, the key findings are represented. For example, both literature and the empirical studies indicate that public-private service networks pose a complex multi-actor situation, with various stakeholders, autonomous actors and different and potentially conflicting interests. Especially in dealing with private organisations, this impacts the applicability of coordination mechanisms, as illustrated in the simulation game, in which participants overestimated their influence on other actors. The multi-layer model was discussed with experts, including participants in the RTD project that provided the first explorative case study and the participants on the simulation game sessions, where the model was presented. They found it very insightful, for example on the idea that coordination at one layer can deliberately be used to deal with a challenge at another. Vertical coordination can – in some fragmented situations – be so difficult that it might be preferred to coordinate horizontally, for example through ownership of data in the network.

In conclusion, the coordination framework enables us to assess the interplay between organisational issues, such as the potential conflicts due to different core forms of

organising, and its effects on processes and data, such as questions on autonomy versus authority and the responsibilities towards a basic infrastructural facility. A final illustration of its value can be provided by an example derived from the RTD project that was the topic of the explorative study in chapter four; in the project, the consortium of developers sought to break-up the service delivery into several steps in the process, performed by various organisations, and to orchestrate an a business process out of these components, based on the service demand. This is consistent with the idea of business process orchestration (e.g. Gortmaker & Janssen, 2007; Janssen, et al., 2006) and works well for relatively predictable processes that have a linear path and in which a coordinating entity or agreement (the 'orchestrator') is available. The value of such an orchestrator was also confirmed in a number of the interviews, reported on in chapter five. This approach was focused on coordinating the interdependencies between the activities and resources at the organisations involved. As these activities were often performed or supported by ICT, and as the resources are often information or data resources, this approach covers the gap between the process and the technology layer.

However, the complex multi-actor situation made this approach unrealistic in situations in which the actors were keen on their autonomy and in situations in which the process flow was not as predictable. Especially the autonomous position of the actors proved troublesome for using this solution, as it interfered with the concept of an orchestrator powerful enough to prescribe which actions have to be taken, at what time and by which actors. This approach was too authoritative to respect the autonomy of the individual actors, especially that of the private parties. Therefore, the coordination of the interdependencies in the process was itself interdependent with the organisational situation. Furthermore, to deal with this dependency, a loosely coupled technical interface based on events was proposed in chapter seven. This is a way to deal with the interdependencies between information systems in such a way that it satisfies the organisational setting by respecting the autonomy of the actors on how they handle such events internally, and thereby also influencing the way the process is orchestrated. However, simply a loosely-coupled technical solution (see also the next section) would also have underestimated the complexity of the coordination challenge, as the insurance that service delivery in fact takes place does – in the situation described here – no longer follow from the process orchestration, but has to be agreed upon between the actors at an organisational level. Collaboration poses a coordination challenge not just between the collaborating actors, but also between their processes, systems, and data. Although an authoritative approach is not feasible, some direction is needed as organisations may have different goals, values, interests and ways of working. As a game participant said: 'even a shared interest can be diverse'. This all illustrates the interdependencies at the different layers and the interdependencies between those layers that all have to be taken into account in the

coordination of the operations of a service network. If not, the execution of cross-organisational service delivery may face problems not seen because of a too limited assessment of the coordination issues at play.

8.3 The tension between organisational and technical coupling

Although the framework is set up as a descriptive model of coordination in public-private service networks, description and prescription are often considered two sides of the same coin. Therefore, we used the coordination framework to develop settings in which the framework was put to practice in the form of a simulation game and in the form of a technical demonstrator. From both we learn that the framework adds value in the identification of interdependent elements, the challenge of coordinating the interdependencies, and help to assess and develop mechanisms to deal with this coordination challenge. Unravelling the coordination into multiple layers enabled us to see how these layers are interwoven.

Already in the work re-integration scenario, we found the tension between the organisational interdependencies and the technical facilitation of the cross-organisational processes. The concept of an activity 'A' which then produces a piece of information that has to be used by another actor as part of activity 'B' fails to respect the autonomy of the actor performing activity B, which wants to be informed that activity A took place, but does not want to be told to 'now' perform activity B. As the actors are autonomous, there is not one actor that can enforce the way the entire cross-organisational flow has to be executed. As a solution to this, we developed a prototype of an event-driven architecture that focuses on a minimal message between the actors, thus leaving to the individual actors how they handle the message (technically and process-wise). However, as providing a public service is not optional, this loose coupling at the technical level in order to respect the autonomy of the actors needs to be accompanied by clear agreements on that events have to be handled; thus not on *how* it happens, but on the promise *that* it happens (i.e. output, instead of throughput). The process view on coordination does not incorporate this complex interplay between the interdependencies in the cross-organisational process, the multi-actor situation with autonomous organisations, and the technical opportunities and limits to not just exchange information but also to provide a means to deal with the difficulties of dealing with the interdependence and coordination challenge at other layers.

The classical literature on organisational action, such as the work of Thompson (1967), provides a useable distinction between sequential and reciprocal process flows. In this research, we illustrate that this distinction has severe consequences on the coordination of process flows in a setting of multiple, ICT-intensive organisations. A contribution of this research is that it makes a concrete case for the differences between coordinating technology-supported sequential cross-organisational

processes and reciprocal multi-organisational process flows. This difference starts with the idea of a shifting decoupling point between service providers and consumers, as put forward in chapter six.

As the decoupling point between the process of the service consumer and those of the service providers shifts in favour of the service consumer, the coordination burden shifts to the network of service providers. Improving service delivery means that the joint service providers take over as much of the burden of orchestration the various components of a service delivery process as possible. Thus, the more the decoupling point is shifted in favour of the service consumer, the more coordination needs to be done by the network of service providers. The more the decoupling point shifts, the more coordination by the service providers is required. In literature, coordination is often seen as managing the dependencies between activities. In the explorative first case, we found five types of activities: the activities that are performed within an organisation, the activities of an organisation that interact with activities of others, the activities of the service consumer, shared activities, and federated activities. Together, the activities of these types make up the activities within a cross-organisational process. The coordination challenge is to deal with the activities that interact with the activities of others (thus, the interdependent activities) without interfering with the activities within (so as to respect the autonomy of the other actor); however, within an organisation, some activities without direct interdependence to activities of other actors have interdependence with activities that do. Furthermore, some activities are not of one actor alone; they are shared or federated (note that federated activities are not necessarily different than activities that interact with others), and multiple actors in the network depend on them. Such activities bring in other coordination challenges, such as trust, as found in research into research question two (see chapter four). Also, such activities may need resources that need to be maintained by one, some or all of the actors in the network.

Together, the activities for a specific instance of a service make up a process flow. This process may be sequential and the flow predictable, but in the context of demand-driven service delivery, less predictable and reciprocal flows can also typify the cross-agency process. They provide a nested structure of service delivery, responsibilities and performing activities, as depicted in **Figure 6**. Some of the service requests that – as a consequence of the shifting decoupling point – have to be coordinated by the service providers result in a cross-organisational service delivery process that has a very predictable line of action, often trough a sequential process flow. However, networks also feature reciprocal processes in which the various actors have to mutually adapt to the situation in a specific case, thus for a specific service consumer. The line of action is then not easy to specify in advance, as it may vary per service consumer.

Technically, there is a challenge that also follows from the interrelationship between organisation and technology. ICT is not deployed in a green field situation and as organisations automated a legacy – fragmented – organisational structure, cross-organisational service delivery has to deal with the legacy of a fragmented information systems landscape, which is a major hurdle for integrating or joining-up service delivery. Organisations often have monolithic information systems within functional siloes. Thus, the activities that an organisation performs may involve multiple departments (which may also have some degree of autonomy) and involve multiple information systems and sources of data. These information systems and data have to be interconnected. However, a process approach of orchestrating a business process from various building blocks that open up functionality from the various systems works well with processes that are predictable, but less in situations with unpredictable process flows.

A reciprocal process flow puts different requirements on the technological facilitation of the process than sequential process flows do. That is, if the network of organisations aims to automate the process flow; non-technical coordination mechanisms could include a case manager. However, as our study of a reciprocal flow focused on electronic service delivery, we needed much flexibility in the interfaces between the various components in a service delivery process. As a result, very loose technical coupling was required. In the demonstrator, this requirement was met by using an event-driven approach. Events serve as a small communication mechanism to inform or instruct, and are permissive in nature. Thus, the way that actors in the network react on them or how they process them, is up to those organisations. As such, it respects the autonomy of the organisations in the network. However, public service delivery is not permissive; if a service consumer is entitled to a certain service, it needs to be realised. Thus, the events are accompanied by agreements that specify that although the events are technically permissive, the handling of those events is not. Organisations that connect to the technical infrastructure of the network agree – by connecting – on those terms and thus pledge that they will perform their part of the service delivery in case a certain event that is relevant to them occurs. Taken together with the technical facilitation of the sequential process flow in the other scenario, we can identify two dimensions of this coupling: one ranging from a tight technical coupling to a loose technical coupling, whereas the other ranges in the reverse direction from a loose organisational coupling to a tighter organisational coupling as depicted in **Figure 15**.

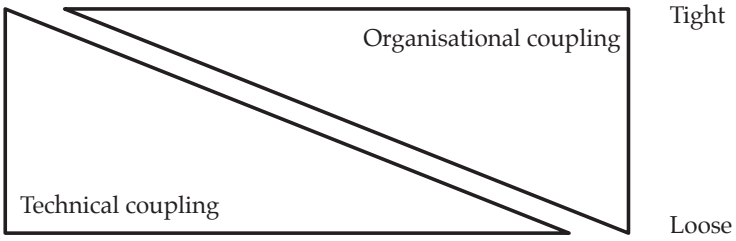

Figure 15: **slider model of organisational versus technical coupling**

The interchange between the technical facilitation of the network and the need for accompanying agreements to secure process execution leads us to conclude that there are not just interdependencies at these various layers, but also between them. This finding was supported in our assessment of the coordination of public-private service networks in practice, discussed in chapter five. Primarily the interviewees working in federal systems indicated that in situations with very fragmented layers of government and socio-political hurdles to coordinate between organisations, there were deliberate choices to coordinate at a lower layer, in this case, the data layer. A too narrow view could mistakenly interpret this situation as simply coordinating the data, but as we have also taken the coordination challenges at the level of the organisational network into account, we see that the potential for conflict is greater when the interdependencies in the network were to be coordinated at that level.

Thus, the predictability of the line of action has an effect on the requirements on the coordination solution. This shows that in the extreme ends there are two archetypical forms of coordination. On the one hand there is a service process in which a low predictability requires high flexibility and leads to an archetype with relatively tight agreements, contracts and governance and loose coupling (e.g. through the use of events) at the technical level. The other end of the scale consists of an archetype in which a very predictable situation enables tight coupling of information systems based on steps in a process, and put less stress on agreements and other coordination mechanisms at the organisational level. This can even be a conscious strategy in situations that make agreements very difficult, as we have seen in the interview series. These two archetypes form the extreme ends on a scale in which a specific context of a situation renders a tendency towards the one or the other more applicable.

8.4 Limitations and suggestions for future research

As the final step in this chapter, we discuss the limitations of this study and provide suggestions for future research.

8.4.1 Limitations of the study

There are two main sets of limitations of this study. One has to do with the scope and theoretical lens of this research. We discuss that in the next paragraph. The other has to do with the methodology used. In chapter two, we have already discussed some of the limitations of our use of a case study strategy and how we deal with validity concerns. Still, this research is limited by being interpretative and qualitative in character, by the limited number of cases researched and the focus on exploring the topic in-depth instead of empirical testing. Although public-private partnerships and the contracting out of government tasks have some history, the collaborative public-private service networks as we defined it are a contemporary phenomenon. Consequently, we were limited to explorative research. As a result, generalizability is limited at best, as we evaluate the use of the framework in settings different from the explorative studies, but these settings have validity concerns as they represent an abstraction of reality. Given that both literature and practice expect that more public-private service networks will form in the near future, we choose to study the coordination of these networks now, despite the consequences this has for the methodology and consequently the validity. When more of these networks come to maturity, other methods can be used to study them and put them to empirical testing to enable generalizability. For now, the framework is primarily analytical by enabling the unravelling of interdependence. It is partially used heuristically in chapter seven, where it enables seeing trade-offs.

The second strand of limitations is related to our view on the object of study. We studied the delivery of public services by networks of public and private organisations and have delineated service delivery to the facilitation and execution of the tasks that follow from the obligations or entitlements of individual citizens and businesses towards government. This thus includes passports, taxes and specific social support, but excludes infrastructure (e.g. roads), hospitals or educational institutions in general. When it comes to public and private organisations, we have focused on collaboration between the two types of organisations in order to realise joint service delivery. Thus, we have not looked at the interdependencies that arise when governments fully outsource certain tasks or functionality, such as ICT, to private sector companies. Also, whereas much literature on networks in public administration is on policy networks, we have focused on the execution of tasks. These may be a result of policy, but the networks we focus on actually provide services.

We have taken a coordination lens, thus focusing on the elements in public-private collaborations that are interdependent for the goal of realising public service delivery. In the design of this research, we choose to assess the interdependent elements in a public-private service networks as black boxes, and focus on the interdependence between those black boxes. This means that did not look into e.g. information systems,

but focus on their role in a public-private service network. Furthermore, we have not looked inside organisations and their internal monitoring and management, except when this impacted interdependence or coordination in the network, which is the case for the fragmentation and functional siloes within organisations. Furthermore, we did not focus on the legal and judicial aspects that are an important part of most activities of government organisations. In practice, there may be legal hurdles that limit the involvement of private organisations. In the research, we have encountered some, such as the limitations of certain e-government building blocks that may not be used by private organisations. Also ICT was assessed on the interdependencies it poses and its impact on other elements of interdependence. Apart from this we did not go into the details of the specific technologies and their capabilities, for example web service orchestration languages, XML, EDI and Standard Business Reporting. A similar limitation applies to human factors or resistance to change that might play a role within organisations. These factors were outside the scope of this research.

Pertaining to our focus on public-private service networks: we argue that such networks have a different character than public-private partnerships for e.g. infrastructure projects. Therefore, our findings cannot necessarily be applied to such PPPs. However, such partnerships might learn from this study. In general, this study provides insight in interdependencies between public and private organisations, findings that can be used by any government party that works with private partners.

Also, we have not measured the actual quality of service delivery, but start from the literature arguing that services should be provided by public-private collaborations. Measuring service delivery quality is a different challenge, with its own difficulties (see e.g. Pollitt, 2009). The same applies to the efficiency of services. Although this is an argument often made in e-government literature, we have not measured the costs or efficiency savings in public-private service delivery. Consequently, this research does not make a choice in favour or against public-private service delivery, but explores how to deal with the interdependence in such a complex organisational and ICT setting.

Finally, researching complex or 'wicked' issues always involves choices. Every description of every part of such an issue relies on choices – deliberate or not – on what is seen, what is reported on and what is analysed. In this research, we have attempted to show as much as possible of the relevant complexity by clearly specifying the theoretical background of our view, by being explicit on the elements we have studied, and in using them to structure the empirical material. However, ultimately choices are always to a certain extent arbitrary. In the same way, it was also a deliberate choice not to employ quantitative methods, such as surveys. We feel that this is justified, as this would have required a reduction of the complexity of the

situations we researched, which would have harmed the objective of understanding a phenomenon in its complex environment.

8.4.2 Suggestions for future research

Research is never entirely finished. For this study, we identify two strands of potential future research directions. The first is based on an expansion of the research conducted in this study. The second is based on our findings and is expanded to other domains and theoretical perspectives.

To start with the first category, we expect that more public-private service networks will arise in the years to come. This provides opportunities for expanding the research done in this dissertation. Future public-private service networks can be studied to test and refine the coordination framework. This can be done in multiple ways:

- As we have discussed in the limitations section, the coordination framework consists of elements that we have treated largely as a black box. The individual concepts that are part of the framework may have a variety of perspectives and theories underlying it. This study provides the overview, the bigger picture. Future research could focus on a more detailed understanding of those underlying concepts and how they relate to the bigger picture. In other words: in future research, the individual black boxes should be opened, for which the coordination framework can be used to unravel the coordination that takes place between that opened black box and other boxes.
- We have focused on integrated service delivery in the sense that it is provided to service consumers upon their request. However, another form is also imaginable, in which the service providers act upon information from the network. The service consumers then do not have to request a service; instead of a 'single window', this is more like 'no window' service delivery. Future research can investigate how the coordination challenge for that and other forms of service delivery differs from our study here. For example, the idea of a shift in the decoupling point between service providers and service consumers is also very relevant to businesses, whereas we have been focusing on citizens for most of this dissertation. Businesses ideally have a good overview on their own processes and much information that governments need is also relevant from the business perspective. Governments could therefore use business information as an authentic source of information, and thereby reduce the need for businesses to provide information to a wide variety of different government organisations. The additional coordination burden that arises from this shift from single window to a no-window (also referred to as an extended single window) will have to be investigated. As a result, organisations can – in their development of single window solutions – already prepare for no-window service delivery.

- To strengthen the validity of the research, comparative studies on the coordination of service delivery in multiple areas or countries can be undertaken. Such comparative research is available at the level of policy coordination and should be extended with our multi-layer approach to coordination as integrated service delivery is not just a policy issue, but needs to be realised in actual cross-organisational processes, which involves a complex and often fragmented setting of organisations, information systems, and data. In longitudinal research, the developments can be tracked over time. In general, other methods should be employed to empirically test the framework.
- Furthermore, the organisations involved in this research are primarily large government organisations that provide a limited number of services in large quantities. In future research, this should be expanded to include organisations that offer many different services (e.g. municipalities).

In the second category of recommendations, we can distinguish a trend in the developments of integrating or joining-up service delivery. Currently, organisations attempt to integrate the operations within organisations to deal with the fragments in them. Next, multiple organisations offer services in a one-stop-shop, or integrate across a service delivery chain or network. Currently, nation-wide facilities are under development to combine service offerings of organisations in one place. The next step could – for some situations – be the European or global level. In all those situations, collaboration between public and private organisations is expected to become more important.

Especially for services on a multinational scale – such as global trade lanes, which include multiple national authorities and large private companies – this alters the playing field. In this study, in the relationships between the actors in the network, principal-agent relationships were both proposed by literature and seen in the cases, as in both the portal in chapter four and in the RDW case in chapter five, a government organisation assumes a leading role. In an international situation, the networks consist of many – autonomous – actors in which directive coordination may not be applicable, and self-regulation may be more important. Still, also in a national situation, the nature of government to try to account everything in hierarchy needs adaptation to meet the network character of today's issues. System-based controls should be researched as an alternative to the current focus on individual transactions, to accommodate the nature of networks better.

The multi-layer model from this dissertation can add the multi-layer perspective on interdependence between the steps in such global processes. However, for this it needs to be expanded with other perspectives. For example, an institutional perspective can help to provide a solution on the question how actors realise

collective action in a situation of complex interdependence and of diverging interests and perspectives while there is a common goal. This requires a structured analysis of the stakeholders, their positions, what they want to disclose, what not, etc. Furthermore, in self-organising situations, the balance of power between the actors needs to be taken into account, as it is undesirable that one party takes over everything in e.g. global trade lanes. In the field of physical infrastructures, this idea is gaining importance (e.g. as a result of liberalisation and deregulation).

Such a global network of public and private parties can be studied in extension of our finding on the different modes of organising, as hierarchy may clash with markets in these global networks. Expanding our coordination view with lessons from institutional economics and political economy, we can build a theory for collaborations between public and private actors that aim to realise collective action, on any scale.

Epilogue

"Whoever ceases to be a student has never been a student"

- George Iles -

The provision of public services by networks comprising both public and private organisations brings many interdependencies. Such networks are capable of relieving citizens and businesses of the burden of contacting various departments and organisations as part of essentially the same process, but then these interdependencies have to be coordinated by the service providers in order to realise integrated service delivery. In chapter one, we therefore started with the objective of understanding the interdependence and coordination in public-private service networks. In our study of the theoretical backgrounds of this research, we argue that this objective does not just serve the goal of improving service delivery, but also adds to the scientific understanding of interdependence and coordination in such networks, as current literature does not sufficiently cover this.

The coordination challenge in public-private service networks is complex as there are many elements that are interdependent and they are interdependent in complex ways. It is unlikely that in a globalised and information-intensive world, the complexity of the interdependence will be reduced. On the contrary; interdependence is everywhere. Compare, for example, the interdependencies in the process of something as simple as a loaf of bread. In ages long past, this included a farmer, a miller, a bakery, and the customer. Nowadays, it involves supplies from all over the world, food regulations, safety regulations, banks, Customs, taxes, transportation, bakeries, middlemen, buyers, and sellers. To deal with the complexity of the interdependence, we require a better understanding of the coordination challenge this poses and the coordination mechanisms suitable for dealing with this challenge. In this study, we have mapped that complexity and came up with a multi-layer framework of coordination. During the process of this research, insights were gained that are technically not part of the research and – for the reasons of rigour – cannot be discussed as part of the conclusions of the study. Therefore, this last chapter serves as an epilogue to this study, in which we widen the scope. We start with the implications of this research for theory and after that discuss the implications for the practice of public-private service delivery, although these are not always entirely separable.

Implications for theory

Public-private collaboration to realise public values

The theoretical foundation of the public-private collaboration we have been focusing on is in the discussion of public sector reform found in public administration literature. This started with a response on the perceived inefficiencies of traditional (Weberian) bureaucracy. A major stream in public sector reform has been that of the New Public Management, focusing on exporting private sector practices to the public sector and shift government activities to the private sector. The response to this movement, in turn, targeted the perceived narrow utilitarianism of this movement and argued that in practice, governments often do not go as far as NPM prescribes. In the service delivery arrangements we have looked at, the relationship with the private sector is not one of outsourcing and competition, but one of collaboration; public and private, instead of public versus private. Literature also describes networks as a way of seeing and describing the organisational structure found in organisations and between organisations. When combining the two, we have seen that of the two implicit theories in public-private networks that Milward and Provan (2003) describe (i.e. competitive contracting and continuum of care) the networks we found primarily focus on the idea of creating a continuum of care, crossing the boundaries between public and private organisations. Only the social support scenario in chapter four has some elements of competition in it, but even there the goal is to provide added value by offering choice to service consumers and integrating the selection among the choices with other steps in the service delivery process. So, in terms of the debate between NPM and post-NPM scenarios, the real competitive element of NPM is not the driver of the public-private collaboration, but such collaborations are enacted for the goal of realising public values, such as described in various terms and concepts (e.g. Public Value Management, Collaborative Governance, The New Public Service).

The idea of providing a continuum of care matches the e-government idea of integrating or joining-up service delivery in order to improve service delivery to service consumers, which is seen as an important public value. The primary argument is then to realise public value by improving service delivery. Improving efficiency may also be a goal, but is not the primary argument. With the risk of being too normative, we could say that – given the pitfalls that literature provides for public-private partnerships – in public-private service networks the value argument should go first and any efficiency gains are desirable, but not pursued if there is no gain in public value.

Given the importance of public sector values, public-private service networks (PPSN) could be considered the public-private form that fits within what Pollitt and Bouckaert (2004) call the Neo-Weberian State (NWS), in the same way that many

public-private partnerships (PPP) fit the NPM. Therefore, developments towards public-private service delivery do not mean a radical transformation of the way governments operate towards a market system. The existing hierarchies, networks and markets shape the context in which future developments will take place. There is no green field to design a new public administration in.

In fact, the provision of services through a public-private service network is also a choice. A public-private service network is – in that sense – an abstract form of coordinating service delivery. The organisation(s) responsible for the specific services can also choose for attempting to provide services by hierarchies, or to outsource them to the market. The choice for public-private service networks is determined by the goal of improving service delivery by integrating the various service components. In other words: it is a choice to facilitate the process that a service consumer goes through, even if that entails interactions with other organisations – both public and private. Consequently, if a government organisation decides that services should be integrated from the service consumer perspective (i.e. the service provider/consumer decoupling point is shifted in favour of the latter), this means that the coordination mechanism should also facilitate public-private service networks.

Coordination theory versus practice

We gathered both classical literature on coordination (primarily within enterprises) and contemporary literature on the coordination in networks or of activities. The literature describes forms and types of interdependence, primarily between the activities that together make up a process flow. For these interdependencies, a library of potential coordination mechanisms is available. When it comes to more high-level forms of coordination, networks themselves are considered not only concrete forms of organisation but also forms of coordination. As such, networks are often placed on the level of hierarchies and markets, which are then considered the other archetypical forms of coordination. At that high level of abstraction, hierarchy is said to coordinate through formal control and bureaucracy, whereas markets coordinate through mechanisms such as price and competition. Networks, which are often positioned in between, rely on trust and mutual adjustment as main coordination mechanisms.

However, these ideal types are not easily found in practice. Also within government, the type 'hierarchy' is an oversimplification of the fragmented organisational structure that comprises various actors with varying levels of autonomy. A hierarchical (i.e. authoritative, top-down) approach is not always entirely applicable within government, especially not in politically sensitive structures. Furthermore, the actors (e.g. departments) within organisations are formally part of the hierarchy of the organisation, but in practice, they work in one or multiple chains and networks. Integration within the organisation can then be based on hierarchy, but conflict with the reality of the organisational setting that these departments work in. This supports

our (theoretically substantiated) assumption that nowadays, more and more service delivery is realised through networks. Thus, the affiliated coordination mechanisms (trust and mutual adjustment) are more applicable than hierarchical mechanisms.

However, whereas coordination approaches that focus on managing the dependencies between activities are too narrow to accommodate the complex socio-organisational and technical setting, generic coordination mechanisms such as trust do not tell much on how to coordinate the many everyday interactions between the actors in a network that provides services. When looking at literature on networks or public-private partnerships, the interdependencies between the organisations are managed at what could be called a project-managerial level. Clear principal-agent relationships, primarily by strict contracts and agreements are important, however, together with a coordination focus on activities, these views are too narrow. A public-private service network has a structural component to it, as it comes with long-term, repetitive exchanges between the actors involved. Furthermore, for every cross-organisational service delivery process (could be thousands a day), the network has to deliver. A focus on just activities is not enough as it does not respect the complex socio-organisational situation, and the focus on that situation through contracts and agreements foregoes on the operational or executive nature of the network, in which a wide variety of (legacy) information systems have to be interconnected, data has to be shared, and process steps have to be aligned seamlessly.

By looking for interdependence between organisations, process step, information systems and data, we were able to respect the complexity of the case studies, as the coordination challenge was not just on dealing with pieces of service delivery, but also about dealing with the organisations that provide those pieces, the background and interests of these organisations, the technology that is used to interconnect these pieces, and the data that is used throughout the network.

Socio-political environment

Although not central to our research, it is important to recognise the socio-political environment of the matter at hand, and the impact of this on our object of study. The study at hand poses a typical multi-actor problem. In the theoretical background we have seen that networks can be typified as having multiple stakeholders. When it comes to public-private networks, the difference between types of stakeholders becomes even more complicated and multi-layered. This complex multi-actor environment results in a situation in which there is no objectively perfect outcome, as the usability and impact of the decisions made in the analytical and design process depends on the interests and perspective of each of the stakeholders.

The cases illustrate that it is important to recognise and cope with the autonomous positions of many of the actors involved. Primarily in the case backgrounds, the

complexity of the case – including the complexity stemming from the multi-actor situation – is clearly illustrated. In the framework, we have used the insight that coordination mechanisms have to respect the relative power positions and autonomy of actors. In the game sessions, we have seen that game participants overestimate the room they have for the subordination of other actors, which is something public servants are used to, if the hierarchical structure allows it. The game shows that the capabilities that public organisations have developed for stages such as the introduction of information systems need to be adapted when the earlier stages of development are complete. The capabilities need to dynamically be substituted for those stressing collaboration and transformation, if public organisations are to realise collaborative and integrated public services.

We conclude by stating that coordination – in every form and layer – has a political component to it. The result of this is that the applicability of coordination mechanisms and architecture does not (only) depend on the fit and quality of those mechanisms and architecture, but also on the power setting. Even though this is a sidetrack in the research, this needs to be acknowledged for its potential to influence the findings in the main tracks of this research. Though many service integration efforts focus on the technological facilitation thereof, this research could not have been done properly without taking the organisational situation into account. The coordination model unravels that layer and shows reasons at the level of the network of organisations for the interdependence between the layers. One could study the layers independent from each other (which has been done often enough), but the consequence of this is that such approaches leave out key components relevant for the coordination of public-private service networks.

Implications for practice

Governments aim to improve service delivery to citizens and businesses. Often, this is translated to the integration or joining-up of services. Such integrated service delivery reduces the administrative burden of the service consumers, as they no longer have to manage every individual interaction with every individual actor involved in a service process. From a service consumer's perspective, service delivery processes transcend organisational boundaries as well as the boundaries between the public and the private sector. Public-private service networks are a way of portraying the situation in which both public and private organisations collaborate in order to provide public services. The application is still limited, but the concept has the potential to becoming a widespread mechanism to deliver public services. The private organisations can play different roles, but have to add value to the service delivery. Such added value can for example come from the additional service channels that they form or because they complete a set of services offered by government organisations.

In these days of a global economic crisis and recession, governments are also forced to cut costs and improve the efficiency of their operations. In The Netherlands as well as in other countries, there appears to be a revival of the idea that governments can cut costs by allocating tasks to private sector organisations, thus do less themselves. Although we have not specifically looked at the financial benefits of public-private service networks, the feeling we get from the cases is that – properly supported by ICT – they offer the potential to improve efficiency of government operations alongside effectiveness of public service delivery. However, to avoid the pitfalls that public-private partnerships have encountered, the set-up of such networks has to be right. The goal of realising high-quality service delivery, combined with other public values (e.g. accountability) and the extensive use of ICT in government, makes that the story is bigger than just costs.

Despite the ideas about peer relationships and networks, we see that some kind of principal-agent relationships form in public-private service delivery. We believe this is due to fact that the responsibility for warranting public value lies with a/the government agency in a network; they are held accountable and for those parts that they put out to other actors, they have to have some governance, steering or control mechanisms to ensure that values like equality, transparency, accountability, and service delivery are also allocated properly in a network. This is needed as they need to be able to bear the accountability requirement put on them. In case that more tasks are allocated to private parties, this is the role that a government organisations needs to play in a network and the technical arrangement needs to match this; it needs to be able to realise this role of a government partner. Also in case the technical coupling is looser, the agreement level needs to take care of this. This coordination problem also plays a role in society at large; the roles and responsibilities of all actors (government, businesses, citizens) need to be allocated clearly, in which respect is paid to the interests and contribution of other actors, and attention paid to the information/technical arrangement, as that is an undeniable part of contemporary structures.

Public-private service networks require cross-organisational collaboration, which introduces a complex set of interdependencies. These interdependencies have to be understood in order to coordinate these networks. Governing through public-private service networks requires that more respect is paid to the autonomy of the partners than would be the case in a network comprising only public partners. But even in such networks, the fragmentation of organisations already leads to a coordination challenge at the organisational level. One of the main difficulties in dealing with private organisations is that public values need to be warranted by the public partners. Both in theory and in a case study, we have seen that the values and interests of private parties are different than the values of government. This is not necessarily a problem, but the government partners have to ensure that public values

are respected. In general, governments need to retain control over the vital infrastructures of society, but it can allow private parties and non-profits to play a role.

As service requests essentially cross organisational boundaries, the efforts that organisations put in improving coordination within their organisations have to respect this. Currently, government organisations attempt to deal with the fragmentation within the organisations, but they should not lose sight of the interdependencies that the fragments within the organisations have with actors in the networks they operate in. The integration of functions in an organisation, nor in a network, should be a goal in itself. It should lead to e.g. improved effectiveness of government operations, to the reduction of redundancy, to the improvement of efficiency, and to improved quality of data that is used by the organisations.

The specific goals vary per situation and situations vary as they have different organisational, political and judicial contexts, different levels of ICT maturity, different values, different types of processes, etc. Therefore, there is not a one-size-fits-all coordination solution. In this research, we have attempted to unravel the complexity of the interdependence, but the actual deployment of a certain form of coordination varies for every situation. The coordination model can be used as a descriptive model of coordination in public-private service networks. However, by unravelling coordination in the description of it, the additional understanding gained by that process could be used to put together coordination more informed. As such, the model can also be used in a prescriptive sense. The idea is that the multi-layer approach is necessary to enable differentiation of coordination mechanisms in order to select the mechanisms that math the complex situation better than coordination approaches driven by a narrow view can. The complexity of reality is very large and requires flexibility in the pool of potential coordination mechanisms. By unravelling the coordination challenge through multiple layers, coordination is public-private service networks can be assessed better and more flexibility can be handled. The findings illustrate the coordination can be based on differentiation of coordination layers, and do not necessarily rely on integration.

In the game we have seen that centralised directive coordination only works insofar the coordinator can manage the complexity. More structural forms of coordination are required if the situation becomes too complex. This observation has severe implications for management; previously the focus was on vertical management, but our findings show that vertical management can be substituted or accompanied by horizontal management, for example by exerting ownership over data throughout a chain of organisations. Horizontal management is useable in settings that are too fragmented for vertical management, whereas vertical management is for example

very suitable to coordinate from central to lower government agencies, as they are part of a hierarchical structure.

To go beyond the results of this study, we think that the discretionary power involved in a decision can be considered a variable in determining the appropriate coordination solution. A bounded decision does not leave much discretion for public servants, and thus enables more predictable line of action compared to free decision, which features more discretionary powers of professionals. With this observation, we wish to make two remarks. First of all, the requirement of flexibility can also come from the frequency of changes in law independent whether they are bounded or free. Furthermore, bounded decisions can be performed well by machine bureaucracies, whereas from the perspective of high quality service delivery this is unlikely to be the preferred solution, as from a service perspective, the cross-organisational services are hard to capture in a machine bureaucracy. In case of free decisions, service consumers are more likely to accept a higher administrative burden, because it is clear that it in such cases it is more difficult to establish whether someone is entitled to something.

Finally, the collaboration with private organisations has implications for the electronic infrastructure and the building blocks for e-government that accompany that infrastructure, which governments are rolling out. In The Netherlands, this infrastructure is focused on the public sector only. However, physical infrastructures as well as other government issued facilities such as passports are used by the entire society, not just by the public sector. Governments should consider this in every building block they are planning; even if they are initially designed to facilitate government to service consumer or government to government communication, the digitisation and network structure of the society levels boundaries between the digital world (e.g. electronic authentication) and the non-digital world (e.g. passport). Combined with the idea that (service delivery) processes cross boundaries between organisations and sectors, a focus on facilities on one sector and one world only is obsolete. The distinction between government and e-government may no longer be relevant when talking about the executive part of government.

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Appendix A: Semi-structured interview protocol

This is the generic interview protocol used in the interview series and the RDW case, both reported on in chapter five. The goal of the interview is to gain an understanding of coordination in public service delivery within its real-life context. As a result, the questions cover the setting as well as the interdependencies and coordination mechanisms employed.

In an introduction to the interview, the interviewer introduces the research, the goals of the interview, and discusses the main concepts, such as public-private service delivery, coordination, interdependence, and networks to ensure that the same terms and understanding of them is used. Based on this, the interviewer asks the interviewee to answer the questions having the organisation's main service delivery and main organisational network in mind. For the RDW case, the interviewees are asked to focus on vehicle network and the service delivery towards citizens buying and owning a car.

The interview is designed as a semi-structured interview. The protocol therefore primarily contains topics that are discussed. During the interview, the interviewer determines if every topic has been sufficiently discussed. As the topics are interrelated, the order of the questions is not fixed and the interview protocol serves as a general guideline for the conversation. The same person conducts all interviews in order to maximise reliability. This interview protocol is translated from Dutch.

Service delivery and the internal organisation

- What services does the organisation provide?
- Which are the key services? Can you describe them?
- What are recent developments in service delivery? Or what is the future goal? How is this realised?
- (How) does the organisation aim to improve service delivery?
- What are the main hurdles for improving service delivery?
- What other goals or public values are important to realise? How?
- What are the main interdependencies within the organisation (related to service delivery)?
- How would you describe the most important mechanisms of coordination to manage these interdependencies?
- (How) are these mechanisms related?
- What are the (expected) consequences for interdependence and coordination of recent or near future changes in the way the organisation provides services?

Network and interdependence between actors

- Which organisations are involved in the service delivery chain/network? How?

    - What does the cross-organisational process look like?
- What is the relationship between your organisation and the other actors?
- Which (kind of) interactions are there between your organisation and the others?
- What is the frequency of those interactions?
- Are there problems? What is their nature? How are they dealt with?
- How are public/government values warranted when working with private parties?
- Would you say that the collaboration is primarily aimed to improve the situation (e.g. service delivery) for the service consumer, or to improve the operations of the organisations (e.g. synergy)?
- Which (elements of) interdependence exists in the network?
- How is the network governed?
    - Why (this way)? Were there recent changes? What are the pros and cons?
- How are the interdependencies in the network coordinated?
    - Why (this way)? Were there recent changes? What are the pros and cons?
- How are cross-organisational processes managed?
- How much is formalised?
- How is stability/continuity warranted?
- If you are the lead organisation; when are other actors involved in processes? E.g.
    - Operational processes,
    - Design of service delivery,
    - Policy making,
    - …
- (How) does the structure of your organisation and/or that of the network impact the collaboration with partners?
- How would you describe the coordination arrangement or the most important mechanisms of coordination in the network?

Back office, information and data

- Which information/data is shared in the organisation? And in the network?
- Which data is not shared? Why not?
- What are the consequences of sharing or not sharing?
- Which role does information/data play in the network?
    - How is that role formalised or arranged?
    - How is information exchanged in the network?
- Which interdependencies exist between systems? And between data?
- Which forms or mechanisms of coordination are applied?
- Which hurdles can be identified in the interdependence at the level of systems and data?
    - How are they dealt with?

- How is the cross-organisational service delivery supported by technology?
    - (Technology includes e.g. information systems, data, architectures)
- How is the technology supported by the (choice of) process and organisational arrangements?
- What are the limits of the organisational, social or political setting for the choice and deployment of technology?
- What are the limits of the technological setting for the realisation of cross-organisational service delivery?

Appendix B: Publications by the author

Scientific publications – journal articles

- Klievink, B., & Janssen, M. (2008). Improving Government Service Delivery with Private Sector Intermediaries. *European Journal of ePractice, 5 (October)*, 17-25.
- Klievink, B., & Janssen, M. (2009). Realizing joined-up government - Dynamic capabilities and stage models for transformation. *Government Information Quarterly, 26*(2), 275-284.
- Janssen, M., & Klievink, B. (2009). The Role of Intermediaries in Multi-Channel Service Delivery Strategies. *International Journal of Electronic Government Research, 5*(3), 36-46.
- Overbeek, S., Klievink, B., & Janssen, M. (2009). A Flexible, Event-Driven, Service-Oriented Architecture for Orchestrating Service Delivery. *IEEE Intelligent Systems, September/October*, 31-41.
- Van Veenstra, A. F., Janssen, M., & Klievink, B. (2009). Strategies for Orchestrating and Managing Supply Chains in Public Service Networks. *Electronic Journal of e-Government 7*(4), 425-432.
- Klievink, B., & Janssen, M. (2010). Simulation gaming as a social development instrument: dealing with complex problems in the 2.0 era. *Information Polity, 15*(1-2), 153-165.
- Janssen, M., & Klievink, B. (2010). Gaming and simulation for transforming and reengineering government: Towards a research agenda. *Transforming Government: People, Process and Policy, 4*(2), 132-137.
- Bharosa, N., Janssen, M., Klievink, B., Van Veenstra, A. F., & Overbeek, S. (2010). Guiding Integrated Service Delivery: Synthesizing and Embedding Principles Using Role-Playing Games. *Electronic Journal of e-Government 8*(2), 83-92.
- Van Veenstra, A. F., Klievink, B., & Janssen, M. (2011). Barriers and impediments to transformational government: insights from literature and practice. *Electronic Government, An International Journal, 8*(2/3), 226-241.
- Van Stijn, E., Klievink, B., & Tan, Y.-H. (2011). Innovative ICT solutions for monitoring and facilitating international trade. *Network Industries Quarterly, 13*(3), 26-29.
- Janssen, M. & Klievink, B. (forthcoming). Can Enterprise Architectures Reduce Failure in Development Projects? *Transforming Government: People, Process and Policy*.

Scientific publications – conference papers

- Klievink, B., & Janssen, M. (2008). *Stage models for creating joined-up government: from local to nation-wide integration.* Paper presented at the 9th Annual International Digital Government Research Conference, Montréal, Canada.

- Janssen, M., & Klievink, B. (2008). *Improving Governmental Service Delivery: Disintermediation and Re-Intermediation Strategies for Multi-Channel Management*. Paper presented at the 8th European Conference on e-Government.
- Klievink, B., Janssen, M., Lankhorst, M. M., & Van Leeuwen, D. (2008). *An Event-Driven Service-Oriented Architecture for Coordinating Flexible Public Service Networks*. Paper presented at the 7th International Conference EGOV 2008.
- Janssen, M., & Klievink, B. (2008). *Do we need intermediairies in e-government? Intermediaries to create a demand-driven government*. Paper presented at the 14th Americas Conference on Information Systems (AMCIS 2008).
- Klievink, B., Van Veenstra, A. F., & Janssen, M. (2009). *Failure to Transform: The Gap in e-Government Stage Models*. Paper presented at the 9th European Conference on e-Government.
- Klievink, B., & Janssen, M. (2009). *Improving Integrated Service Delivery: A Simulation Game*. Paper presented at the 10th Annual Conference on Digital Government Research (dg.o 2009).
- Van Veenstra, AF, Janssen, M. & Klievink, B. (2009). *Strategies for Integrated Service Delivery and Supply Chain Management*. Paper presented at the 9th European Conference on e-Government (ECEG 2009).
- Van Veenstra, AF, Klievink, B & Janssen, M. (2009). *Barriers for Transformation: Impediments for Transforming the Public Sector through e-Government*. Paper presented at the 17th European Conference on Information Systems (ECIS 2009).
- Janssen, M, Klievink, B & Kuk, G. (2009). *A practice approach for Orchestrating Service Delivery Channels*. Paper presented at a pre-ICIS workshop.
- Klievink, B., & Janssen, M. (2010). *Coordinating e-Government Service Delivery*. Paper presented at the 11th Annual Conference on Digital Government Research (dg.o 2010).
- Janssen, M., & Klievink, B. (2010). *ICT-project failure in public administration: The need to include risk management in enterprise architectures*. Paper presented at the 11th International Digital Government Research Conference (dg.o 2010). **Best Paper Award.**
- Bajnath, S, Janssen, M, Bharosa, N, Both, C, Klievink, B, Overbeek, S, & Van Veenstra, AF, (2010). *Deriving Service Delivery Principles Using a Role Playing Game*. Paper presented at the 10th European Conference on e-Government (ECEG 2010).
- Klievink, B., & Janssen, M. (2010). *Simulation games for collaborative development in e-Government*. Paper presented at the Hawaii International Conference on System Sciences (HICSS) 43.
- Overbeek, S, Klievink, B, Hesketh, D., Heijmann, F, & Tan, Y-H. (2011). *A web-based data pipeline for compliance in international trade*. Paper presented at the 1st Workshop on IT Innovations Enabling Seamless and Secure Supply Chains (WITNESS 2011) held in conjunction with the EGOV 2011 Conference.

Scientific publications – book chapters

- Klievink, B., Derks, W., & Janssen, M. (2008). Enterprise Architecture and Governance Challenges for Orchestrating Public-Private Cooperation. In P. Saha (Ed.), *Advances in Government Enterprise Architecture* (pp. 263-283). Hershey: IGI Global.
- Bharosa, N, Feenstra, R.W., Gortmaker, J, Klievink, B, & Janssen, M (2008). Rethinking Service-Oriented Government: is it really about services? In Harry Bouwman, Roger Bons, Martijn Hoogeweegen, Marijn Janssen, & Hans Pronk (Eds.), *Let a thousand flowers bloom* (pp. 237-254). Amsterdam: IOS Press BV.
- Klievink, B., & Janssen, M. (2011). Integrating Public and Private Services: Intermediaries as a Channel for Public Service Delivery. In V. Weerakkody (Ed.), *Applied Technology Integration in Governmental Organizations: New E-Government Research* (pp. 215-226). Hershey: Information Science Reference.

Professional publications and research reports

- Klievink, B & Janssen, M (2008). Coördinatie als bouwsteen van MCM in de overheid. Regievraagstukken bij kanaalmanagement. Enschede: Telematica Instituut.
- Heerink, L, Lankhorst, MM, Leeuwen, D van & Klievink, B (2008). Instrumenten en technologie voor kanaalmanagement. een overzicht van technologie en instrumenten ten behoeve van het gebruik en beheer van communictiekanalen. Enschede: Telematica Instituut.
- Klievink, B, Janssen, M, Lankhorst, MM & Leeuwen, D van (10-24-2008). Integratie e-diensten lastig maar haalbaar. Digitaal Bestuur - uit 't lab.
- Fielt, E, Janssen, M, Klievink, B & Pieterson, W (2008). Internationale lessen voor multichannelmanagement. Een studie naar praktijkervaringen in Europa, Canada en Australië. Enschede: Telematica Instituut.
- Lankhorst, MM, Klievink, B, Oude Luttighuis, P, Fielt, E, Heerink, L & Leeuwen, DJ van (2008). Kanaalpatronen. Functionele structuren voor multichannelmanagement. Enschede: Telematica Instituut.
- Teerling, M., Pieterson, W, Janssen, M, Fielt, E, Klievink, B & Pauwels, K. (2008). Multi-Channel Management Workshop. In Ae.Chun Soon, Marijn Janssen & J..Ramon Gil-Garcia (Eds.), dg.o 2008. The Proceedings of the 9th Annual International Digital Government Research Conference (pp. 385-386).
- Pieterson, W, Teerling, M., Klievink, B, Lankhorst, MM, Janssen, M & Boekhoudt, P (2008). Multichannel management. De stand van zaken. Enschede: Telematica Instituut.
- Klievink, B, Janssen, M, Lankhorst, MM & Leeuwen, D van (2008). Regie van samenwerkende dienstverleners. Coordinatie van het B-dossier. Enschede: Telematica Instituut.
- Klievink, B, Janssen, M, Pieterson, W & Fielt, E (2008). Multi-Channel Management Strategy and Coordination: The next hurdle in customer-orientation. The

Proceedings of the 9th Annual International Digital Government Research Conference (dg.o 2008) (pp. 385-386). **Best Poster Award**.

- Klievink, B. (2009). Book Review: Digital Government: E-government Research, Case Studies, and Implementation. Information Polity (2009:1/2). 143-145
- Pieterson, W, Klievink, B & Janssen, M. (2009). (Workshop) Multi-Channel Management: Putting it into Practice. The Proceedings of the 10th International Digital Government Research Conference (dg.o 2009).
- Klievink, B & Janssen, M. (2009). Kanaalcoördinatie: een simulatie game voor het verbeteren van multichannel publieke dienstverlening (Novay)
- Two electronic deliverables: Kanaalkompas en Wiki Kanalen in Balans (Novay)
- Klievink, B. Kanaalcoordinatiegame: Twister of Vier-op-een-rij?

Awards

- Best Management Paper Award: ICT-Project Failure in Public Administration: The Need to Include Risk Management in Enterprise Architectures (paper with Marijn Janssen at dg.o 2010).
- Best Poster Award: Multi-Channel Management Strategy and Coordination: The Next Hurdle in Customer Orientation (poster at dg.o 2008).

Summary

Government organisations aim to improve service delivery towards citizens and businesses, for example by using Information and Communication Technologies (ICT) to make services more accessible, make government operations more efficient and effective and thereby reduce the administrative burden for citizens and businesses. A major hurdle in this development is that many government organisations have a fragmented organisational structure, with various departments that are focused on their own functions and have isolated information systems. As service consumers (the term we use to designate the users of government services) often have service requests of which the response requires action of multiple departments, overcoming this fragmented structure is an important step that governments seek to take in order to improve service delivery. These developments go by a variety of names, like joining-up, single-window, or service integration. All of these have the same general idea: the providers of the services have to deal with the interdependence between parts of a service, instead of the consumer of the service.

However, like the process of a service consumer does not stop at the boundaries of individual departments or systems, it often also does not stop at the boundaries of individual organisations. Therefore, organisations have to collaborate and services should not just be integrated within organisations, but also across organisational boundaries. What is more, academic literature indicates that government organisations should also collaborate with actors from the private sector, as they can also contribute to the services provided by government organisations, for example by adding their activities to joint service delivery.

The focus of this research is therefore on cross-organisational integrated service delivery by public and private organisations.

To realise this, the organisations have to attune their activities. We therefore view such networks of public and private organisations as a system of interdependent elements that have to be considered and made to act together (in other words: coordinated) in order to realise concerted action. The concerted action in this research is public-private service delivery.

Even within organisations, integrated service delivery is a challenge due to a lack of interoperability. This challenge is even bigger for service delivery processes that cross the boundaries between organisations. E-government literature, for example, pays specific attention to interoperability, as ICT is not just an enabler for improving service delivery, but also a barrier. Technical means are being developed to deal with this barrier (e.g. SOA, XML, Web services, etc.). Essentially, cross-organisational integrated service delivery has to deal with vertical fragmentation (siloes within

organisations) and horizontal fragmentation (services are fragmented across organisational boundaries).

However, the setting is even more complicated as the interdependencies between the systems that have to interconnect steps in a process are not the only interdependencies that play a role. Organisations have a certain degree of autonomy and, especially when collaborating with the private sector, there are interdependencies at what we call the organisational level. The specific nature of our study is that public and private organisations collaborate (thus not replace each other, as in e.g. outsourcing). Such collaborations for service delivery are intensive and require that systems work together, but also that organisations are aligned and that the service providers jointly orchestrate an integrated process that is able to provide the service required by the service consumer.

Public-private service networks thus seem a good idea from a service perspective, but they result in much interdependence. We posit that a coordination lens can be used to look at public-private service networks as systems of interdependent elements, which have to be considered and made to act together to realise concerted action. The concerted action of our focus is service delivery. Realising this concerted action requires that the coordination deals with a fragmented field of systems, departments, organisations, and a network in which also private parties play a role.

Despite the arguments made in practice and literature in favour of collaborative public-private service delivery, it is unclear how the many and complex interdependencies in such service delivery arrangements have to be dealt with. In other words: it is unclear what needs to be coordinated in public-private service networks, and how, in order to realise joint service delivery. This is the main research question that this research addresses.

Research approach

How we address this main question is discussed in chapter two, where the design of this study is presented. In brief, we use three layers (organisations, processes and technology) to describe the interdependence in public-private service networks. We explore the coordination challenges that arise in public-private service networks when concerted action has to be realised by making the interdependent elements act together. Furthermore, we research how the interdependencies and the coordination challenges they pose are addressed in the coordination of a public-private service network.

We use case studies as we seek to understand coordination in the complexity of the real-world context. Trying to isolate parts of it may improve validity and enable us to look for ‘causal’ relationships between concepts, but as the object of our study (public-private service delivery) exist in a complex setting with many variables that

may play a role and with only a limited number of cases, we have chosen a case-study methodology for two studies. In the first study, we use an explorative case-study approach to identify challenges that arise in dealing with the interdependent elements in a public-private service network. An example to clarify the relationship between the elements and the coordination challenges; organisations are interdependent elements, and their autonomy and potentially varying goals pose challenges to making them act together; the coordination challenges. This explorative study is discussed in chapter four.

In the second study, we use a case study strategy to investigate how – in a public-private service network – coordination takes places. This is addressed in a case study on a Dutch public-private service network. As this is only one case study, we also look for a range of coordination mechanisms in a series of interviews, not focused on a specific case. Both the interview series and the RDW case study are discussed in chapter five.

In all of these empirical steps, we look at the three layers identified in chapter one: organisations, the process, and the information systems. We regard these elements as a sort of black box and focus on the interdependencies between them. This enables us to unravel the coordination of public-private service networks. We consolidate the findings of these two empirical steps in a framework, which thus covers the main interdependent elements in public-private service networks and per element identifies the main coordination challenges. This framework provides insight in what needs to be considered and dealt with in order to realise integrated public-private service delivery.

Theoretical background

In chapter three we trace back the concept of public-private service networks to a debate in literature on the management of the public sector. In brief, this debate finds its origin in the (perceived) inefficiency of government and its overly bureaucratic structure, which serves as the background for proponents of a new public management (NPM) paradigm. That paradigm holds that governments should look more towards business as an example of how they manage government operations. Furthermore, the government should focus on its core tasks and leave to the private sector all what needs not necessarily be done by government. As a response to this, contemporary literature on public sector management and reform stresses that the traditional structure of government also has its benefits – primarily when it comes to realising public values (e.g. equality, transparency) – which are largely neglected by the NPM rationale. Under a variety of names they therefore propose models of public administration that deal with the problems of traditional public management whilst at the same time overcoming the negative aspects of NPM. The role of the private parties shifts towards that of collaborative partners. We summarised this as a shift from

public versus private to a model that focuses on public and private to deal with public questions and tasks.

We combine this strand of public sector literature with developments of ICT in government, the so-called e-government literature. As a result, we adopt a view on developments in public service delivery strongly rooted in both literature on the public sector and the role of private parties and in literature on the role of ICT-enabled public service delivery. Furthermore, we combine this ICT-enabled public-private service view, with literature on networks as a form of organising.

The result is a view in which organisational issues among public organisations and between the public and the private sector are present, but also a view on the information systems and other electronic support that these actors use to perform their tasks. To bring all of those on the same level, we describe a public-private service network as a system of interdependent elements. To realise service delivery, these elements have to be considered and made to act together. Viewing a public-private service network as a system of interdependent elements comes from using coordination theory as a lens on such a system. We thus look at parts of this system (which comprises organisations, systems, services, etc.) that have to work together in order to realise service delivery.

In coordination theory, we see that much mechanisms and perspectives are focused at the level of operational business processes. As such, the way that interdependent organisational elements and more technical elements impact the bigger picture is unclear. More specifically, we find that some literature looks at coordination in its generic forms (e.g. networks as a form of organisation are said to be coordinated by means of trust and mutuality) and that other literature sees coordination as a specific way to deal with dependencies between elements at the level of operational processes (e.g. activities and resources). The theoretical problem we identify is that the first does only provide a general direction of coordination, without being specific as to how concerted action is realised, whereas the second does not address the interdependencies between elements on other layers, such as how the differences between actors are dealt with in the coordination of public-private service delivery.

Ultimately, two propositions are made. One builds on to the theoretical problem and holds that a single layer view on coordination is too narrow to properly assess interdependence and the coordination thereof in public-private service networks. The second asserts that in public-private service networks, networks as a form of organising are not unique and separate from market and hierarchy, but co-exist with both.

Based on this literature review we have a perspective on public-private service networks, construed from various disciplines and backgrounds, and combine that with a lens based on coordination theory. We use organisations, processes and

information systems as layers to assess coordination challenges and coordination in public-private service networks. In chapter four, we use these three layers to analyse the case and affirm that they can be seen as (high-level) interdependent elements in public-private service networks.

Explorative study: coordination challenges

The coordination lens is used to study empirical material in order to answer research questions one, two and three. First, we conducted an explorative study on the development of an electronic portal aimed to provide integrated services by public and private service providers to citizens. This study provides an answer to research question two, and is discussed in chapter four. We use an explorative study, as the number of cases that match our concept of public-private service networks is limited and as we wanted to explore the interdependent elements and their coordination challenges as they come up in the design of public-private service delivery. We describe the case of this service delivery portal in terms of the three layers identified in chapter one: organisations, the process, and technology. This approach leads to the identification of three main interdependent elements: the actors in the network (i.e. the organisations and departments), the steps or activities in the service delivery process that these actors jointly perform, and the information systems and data that are used in these processes.

All interdependent elements found in the description of the case can be related to these three main elements. As each specific situation is likely to yield very specific interdependencies, we stick to the three main levels of interdependence and for each of those we explored the hurdles or challenges that arise in public-private service networks when coordinating these interdependent elements to realise integrated service delivery. These coordination challenges answer research question two. Table 1 summarises the coordination challenges for the three layers. For example, the actors in a network are interdependent, but to deal with these interdependencies, the autonomy of the actors and the organisational structure lead to challenges in the coordination of these interdependencies. The demarcation between interdependencies and coordination challenges is not always entirely clear. For example, each organisation has goals and values, which in itself are not necessarily interdependent with the goals and values of other organisations. However, as the organisations are interdependent, a situation in which the goals and values of various organisations provide different directions for the way in which they collaborate presents a coordination challenge. Ultimately, in chapter six, we go further and argue that the layers themselves are interdependent and a particular coordination challenge may impact coordination challenges at other layers, or find a resolution on such another layer.

We conclude chapter four by discussing our findings from the first case study for both the coordination views we found in the literature in chapter three. When it comes to the generic view on coordination, we found that there is not one unequivocal form of coordination that applies to public-private service networks as the actors that together make up the network encounter multiple of these theoretical forms. Also, high-level coordination mechanisms (such as trust) may play out differently on different layers. For the process-oriented coordination view, we found that although it may be a useable perspective for (cross-organisational) process flows, it does not deal with the complex organisational setting of multiple, autonomous and interdependent actors. Furthermore, cross-organisational processes are also challenged by a landscape of fragmented and legacy systems. On top of that, data also have specific characteristics that increase the coordination challenge. Finally, we found that even within the process perspective, different types of processes can be identified. Whereas many processes have a sequential flow, in which step A precedes step B and so on, we also found services in which the process flow is more of reciprocal character, which relies on coordination by mutual adjustment, which in turn relies more heavily on decisions and communication between actors, which are more at the level of organisations than on the level of processes. In general, the first study affirms the theoretical proposition that the views we found are either too general or too limited to assess the coordination challenges in public-private service networks.

Coordination mechanisms

As we found coordination challenges for multiple layers of interdependence, the question is how public-private service networks deal with these. In other words: how do they coordinate? This is research question three and is the topic of the second stage of empirical research, described in chapter five. This stage consists of a series of interviews and a case study. In the interview series, we elicited the views of experts (primarily practitioners) on the coordination strategies they find in practice. With coordination strategies we refer to a generic approach to dealing with coordination challenges, instead of a comprehensive set of methods and tools employed to that end. This latter is what we refer to when speaking of coordination mechanisms. In the second case study, we cover the case of the Dutch Department of Road Transport (RDW), which operates in a public-private service network. The coordination in this network comprises a comprehensive set of mechanisms employed to deal the interdependencies on all three layers we worked with up until here.

In the series of semi-structured interviews, we have spoken with 20 people from five government agencies in The Netherlands and a total of four government agencies in Belgium and Canada. We used document analysis to strengthen our understanding of the coordination strategies discussed in the interviews. We found that the interviewees identify coordination mechanisms (more specific) or strategies (more

general) on all three layers we used to describe and analyse the interview results. In other words: for different situations, the interviewees discussed ways to deal with coordination challenges on the organisational (even political) layer as well as on the technical layer. Although interviewees spoke of the relationships between the layers within the organisations (for example that in order to streamline a business process, an organisational actor such as a designated department may be required to overcome the coordination challenge of fragmented information systems), in the overall analysis we found that all of these layers play a role across organisational boundaries as well. In other words: whereas the cross-organisational coordination is often focused on one layer (e.g. contractual relations, process orchestration or technical standardisation), a public-private service network has cross-organisational coordination challenges on all three layers. This was further illustrated by the finding that in some situations, coordination can deliberately emphasise one layer to mitigate a greater coordination challenge on another layer. Although the coordination strategies found in the interview series show that the field of coordination includes a horizontal dimension (across actors) and a vertical dimension (across the layers), we did not find a strategy that covers the entire field of these dimensions in public-private service networks. As our proposition holds that this is too limited a view, we conducted a study on the RDW network to explain how coordination can cover the full breadth of interdependence in a public-private service network.

For the RDW case study, we interviewed people from the RDW, the sector association of the motor vehicle industry (BOVAG), and an external consultant. The interviews were semi-structured and we corroborated the results with documents analysis on studies that included the RDW and on factual information from the RDW and Dutch Government. The RDW plays a central role in the networks of organisations that have to do with motorised vehicles on the Dutch roads. In the second part of chapter five, we discuss the case by describing the service delivery processes and the organisations involved. Building on that description, we discuss the coordination in the network. The coordination mechanisms that are used to manage the interdependencies in this network cover the breadth of the interdependent elements (organisations, processes, information systems, and data) and coordination challenges at the various layers. In the network, a basic registry with vehicle information (held by the RDW) is the most important point of exchange in the network and is therefore a coordination mechanism for the data interdependencies in the network. This mechanism is accompanied by coordination on other layers; a network administrative role, a strong focus on collaboration and mutuality, technical interoperability, SLAs, accreditation, applications, agreements, the allocation of roles and responsibilities, formal procedures, and other components discussed in chapter five.

A hallmark of the coordination in this network is that the coordination mechanisms are interwoven. As we used a broad and multi-layered view on coordination, we were

able to see that all the abovementioned elements are part of the coordination of the network. The 'interwovenness' makes it hard to discuss or assess parts of the coordination in isolation. For example, the RDW needs to be a reliable party for the other actors in the network. This is achieved by a combination of consultations, clear communication, interoperable systems, availability, temporary provisions in case of maintenance and other elements of coordination. A focus on only one of these does not respect the complexity of the coordination challenge and mechanisms in the real-life situation.

When corroborating the findings of the RDW study with the interview series, we find that the lens we have used – which means that we were looking at the objects of study as systems of interdependent elements on multiple layers – enabled us to identify a variety of mechanisms used to address interdependence in public-private service networks, and to see that these mechanisms exist on all layers. Furthermore, we have seen that the coordination challenges and mechanisms are interwoven, even to the extent that coordination challenges at a certain layer can potentially better be dealt with by coordination mechanisms at another layer.

A coordination framework for public-private service networks

Based on the theoretical background and the empirical research in chapter four and five, we aggregate our findings on coordination in public-private service networks in chapter six. First, we shed some light on the developments in public service delivery. The move towards cross-organisational integrated service delivery by public and private partners can be described in terms of a decoupling point between two different types of processes: the process that a service consumer goes through and the service delivery process of the joint service providers. The decoupling point is where these two processes meet. The more services are integrated by the service providers, the more the decoupling point shifts in favour of the service consumer, as the service consumer does not have to contact multiple departments or organisations independently for different parts of a service. Offering services in an integrated manner entails that the burden of coordinating the different steps that make up a service delivery process is put on the joint service providers. As the service consumer is no longer the linking pin between parts of the service, the interdependencies that exist between the service providers, the steps in the process, and the information systems and data have to be coordinated by the network of service providers. Thus, the more the decoupling point shifts in favour of the service consumer, the more interdependencies have to be dealt with by the service providers and thus, the more coordination challenges arise for them. In the case studies, we have seen that these interdependencies and the coordination thereof are complex and interwoven. Even though a focus on cross-organisational (chain) processes is relatively common in the discussion of e-government and public service delivery developments, limiting the

coordination to interdependencies at that level alone does not work. For this a broader perspective is required: organisational issues play a role, as the chain process crosses boundaries of autonomous actors, which for example may have different or conflicting values and interests. Furthermore, these organisations have fragmented systems, use different data or use the same data differently.

The three layers we started with have proven useful to describe and analyse coordination in public-private service networks. This multi-layered structure serves our research goal of understanding interdependence and coordination in public-private service networks by enabling three things:

- Unravelling the interdependence in public-private service networks;
- Identify coordination challenges in these networks; and,
- Assessing the coordination of these networks.

The multiple layers can be seen as three main elements of interdependence: the network of organisations, the cross-organisational processes and activities, and the data and information systems. For these interdependencies, we found coordination challenges that public-private service networks encounter when dealing with them. The precise elements that play a role in a network and the precise coordination challenges that these elements bring are case specific. In chapter six we describe the more general lessons on coordination we draw from our research.

As we find that our layered approach helped us to unravel the interdependence and coordination in such a way that enabled us to see that both coordination challenges and mechanisms exist on all the layers and that they are interwoven, we propose a framework that represents the key findings. The framework enables the unravelling of the interwovenness of coordination in public-private service networks. This framework represents: the main interdependent elements in a public-private service networks, including the network of organisations, cross-organisational process flow, and information systems and data; the coordination challenges that can be encountered when dealing with this interdependence; and the fact that interdependence exists across those layers (vertical) and between organisations (horizontal). The framework describes three general layers: the interdependent elements at a high level, and nine sub layers. This complexity – these layers – has to be considered in coordinating public-private service delivery. In chapter six, we discuss the nine sub layers of the framework in more detail. The description represents the outcome of the three steps discussed above: unravelling the interdependence in order to identify the coordination challenges and assess the coordination that deals with these challenges. As such, the nine sub layers can be seen as sources of coordination challenges and ways to deal with them. Taken together, they represent the complexity of coordinating public-private service networks.

To translate this finding to practice we propose that for each level of interdependence there is a trade-off that characterises the main determinant of the coordination challenge. For the network of organisations this is authority versus autonomy. At the level of the cross-organisational process flow this is the sequential versus the reciprocal process flow and at the level of information systems, this is the tight versus loose coupling of the technical elements.

Although this is a simplified view of the complexity, it represents how the interdependencies in cross-organisational public-private processes exist on all three layers, which are interwoven. Based on this view, actors can choose to focus coordination mechanisms to address the interdependencies at the level that involves the smallest coordination challenge. In other words: if a certain situation poses immitigable issues of autonomy at the organisational level, an authoritative coordinator at the organisational level to address the interdependence will not work. If some authority is needed, this can for example be achieved by controlling the data in the network. We found strategies in which actors can reduce the overall coordination challenge; they can seek coordination mechanisms to deal with the interdependence in a way that coordination challenges are smallest and best surmountable. Dealing with coordination challenges where they are smallest, however, requires a multi-layered view as represented in the framework. Using the framework thus enables actors to reduce the overall coordination challenge.

Based on this chapter, we put forward the proposition that not just a multi-layer perspective on coordination is needed, but that the layers are themselves interwoven. This is the key characteristic of the framework. Therefore, we assess this by applying the framework to practice. For this, we use two archetypical situations, based on the three 'determinants' discussed above:

- A predictable, sequential process flow, in an organisational situation that primarily relies on authoritative approaches and has a tight technical coupling;
- A reciprocal process flow, which requires loose technical coupling between the autonomous actors involved.

Putting it to practice

We put the framework to practice to see how the interwovenness plays out in practice. We want to evaluate how it enables to see the coordination challenges on other layers and the potential impact of mechanisms on other layers. We do this in two steps; first we apply the first archetypical situation in a simulation game setting, in which we assess how the organisational setting creates coordination challenges in a relatively straightforward cross-organisational service delivery process, even in a limited and controlled environment.

Second, we put the proposition on the interwovenness of the organisational and technical levels to practice in a demonstrator of an event-driven service-oriented architecture, which provides a way to deal with the interdependence on the level of the interfaces between (technical) components in a reciprocal process flow. This requires loose coupling to deal with the coordination challenge at the level of the interfaces and we see how this impacts the other layers in the network. The consequence of this approach is that the very loose technical coupling requires agreements at the organisational level. However, instead of agreeing on what happens within the process steps (the throughput), a major coordination mechanism is agreements (e.g. SLAs) that focus on the output. In other words: organisations have to agree on what they do, not on how they do it.

We use these two steps to put the framework to practice as the game is based on a sequential process flow and primarily looks at the coordination challenges such a flow brings to the organisational layer, where the tension between an authoritative approach in a network with autonomous actors becomes visible. The demonstrator of the event-driven architecture looks at a technical means to realise a reciprocal process flow. In this demonstrator, we show how the framework enables solutions, as the technical coordination solution needs to be accompanied with mechanisms at the organisational level. Together, these two steps cover all three layers and show how the framework can be used to analyse why coordination goes wrong (in the game) and how it can be used to develop solutions to coordination challenges in a complex public-private service delivery process (in the demonstrator).

In the simulation game, we simulate a real world situation of coordination challenges in a cross-organisational service delivery process in a limited and controlled environment. The framework is used to analyse what goes wrong and, as it is a (non-technical) role-playing game, we use the framework to discuss with the participants how the framework can help in overcoming these problems. Some of the coordination challenges that were put in the game are that some people were awarded a role with an authoritative approach (which is the way many government organisations work) and at the same time an autonomous partner was present. Furthermore, a legacy back office system was introduced and information and activities were fragmented in the organisation and the network. In the five sessions of the game we played, the coordination framework was found to contribute to having participants recognise the dependence they have on other actors for realising the service delivery process. Furthermore, when analysing the issues in the sessions, the framework shows how the organisational tension between the authoritative approach in hierarchy and the autonomy of other actors impacts the other layers. When looking at the game situation as a system of interdependent elements, it became clear to the participants that for dealing with a problem that the front office encounters, an integrated solution is required by the entire chain (including back office departments and partner

organisations) that is involved in the service delivery. Furthermore, the coordination framework showed them that this is not just a question of identifying the interdependencies in the process flow, but that there are also coordination challenges that have to be dealt with at the level of the organisations. A major example from the game is that to make sure the service delivery process offers an integrated response to the service consumer containing the correct data, the various actors that play a role have to collaborate at the organisational level in order to make the original data available to the entire network. Focusing on one layer only is insufficient. Many participants indicated that it opened their eyes to see that their service delivery process yielded incorrect results due to the fact that information was not shared properly in the network, which could not be resolved due to the way this problem was addressed at the organisational level (i.e. authoritatively).

In chapter six, the coordination framework is primarily a descriptive model of coordination in public-private service networks. Its use became clear in the game, where people experienced problems and using the framework they identified coordination challenges on multiple layers as the underlying issue. Apart from using the coordination framework for analysing coordination issues, we developed a demonstrator of an Event-Driven Service-oriented Architecture (EDSOA) to show how the framework can be used to deal with coordination challenges in a public-private service delivery process. The demonstrator shows that for reciprocal process flows the interfaces between process steps can be made very thin in order to accommodate the flexibility needed in the process flow. Using the framework, we see that this increases the coordination challenges at the organisational level. In situations where autonomous actors are able to collaboratively deal with these coordination challenges, the burden of coordinating a cross-organisational service delivery process can thus be transferred from the links between steps in the process to the organisational level.

Conclusions

Based on the combined findings for the individual research questions, discussed in the last sections of the individual chapters, and the results of the practical evaluation in chapter seven, we draw three overall conclusions: first, we conclude that public-private service networks are not a separate form of organisation, but exist together with hierarchies and markets. In this conclusion, we affirm the second theory proposition made in the conclusions of chapter three. Second, we discuss the conclusion that the interdependence in public-private service networks can be unravelled using a multi-layer framework and thereby affirm the first theoretical proposition. Third, we conclude that unravelling the interdependence enables us to see that the different layers in the coordination framework are themselves interwoven.

This research contributes to the debate on hierarchies, markets and networks by revealing that public-private networks are not a unique and separate organisational form; in public-private networks the two types of organisations involved (public and private) bring in both hierarchy and market forms of organising. For public-private constellations, networks are thus not a form separate from hierarchy and market, but co-exist with them both. This conclusion is founded in the differences between public and private organisations. This difference is primarily found in the way public and private organisations deal with inter-organisational level. The way that organisations govern their interactions with other organisations differs. The structure of the public sector (comprising multiple public organisations) is governed by hierarchy, with mechanisms such as command or authority, whereas the inter-organisational interactions in the private sector are marked by market mechanisms, such as price, contracts and competition. Within our cases, these two basic forms of organising – hierarchy and market – come together. Whereas theory on networks sees it as a distinct form of organisation, often between hierarchies and markets, in this research we found that public-private networks are not distinct from hierarchy and market, but include them both. Consequently, for this type of networks, literature that sees networks as a separate form provides an incomplete picture. As the three basic forms discussed in theory – networks, markets, and hierarchies – provide different generic coordination mechanisms (e.g. trust, price and authority, respectively), this research contributes to this literature that all these mechanisms are present in public-private service networks and that potential conflicts can be traced back to the different basic form of organisation that public and private parties have.

In the first proposition from the theoretical chapter we argue that current coordination approaches are either too high-level, or too narrow. Based on the findings of the four research questions, we conclude that a single-layer view on coordination does not capture the complexity of the interdependence in public-private service networks. Process coordination does not respect the relationships between the actors and the autonomy of the organisations, and relationship coordination does not respect the challenges of dealing with a variety of information systems, a multitude of data and the automation of process step sequences that are hard to predict in advance. Also, the general notion that e.g. building trust and other informal mechanisms are very important does not yet provide any concrete answers to how the envisioned public-private service networks can coordinate the interdependencies that arise in their joint activities.

We found that using our framework on interdependent elements enables the identification of various challenges as a coordination challenge. Our search for coordination challenges at the level of the network of organisations, at the level of the cross-organisational processes, and at the level of data and information systems

yielded a number of coordination challenges that are important to take into account when coordinating public-private service networks.

The framework reflects that coordination challenges and mechanisms are found on multiple layers and cannot be understood independent of each other. As such, the framework reflects that collaborating organisations that rely heavily on ICT require a more differentiated view on coordination; joint service delivery requires intensive collaboration and alignment on all levels.

Finally, our third overall conclusion pertains to the interwovenness between the technical facilitation of the network and the need for accompanying agreements. This leads leads us to conclude that there are not just interdependencies at the various layers, but also between them. This finding was supported in our assessment of the coordination of public-private service networks in practice, discussed in chapter five. Primarily the interviewees working in federal systems indicated that in situations with very fragmented layers of government and socio-political hurdles to coordinate between organisations, there were deliberate choices to coordinate at a lower layer, in this case, the data layer. A too narrow view could mistakenly interpret this situation as simply coordinating the data, but as we have also taken the coordination challenges at the level of the organisational network into account, we see that the potential for conflict is greater when the interdependencies in the network were to be coordinated at that level. The predictability of the line of action has an effect on the requirements on the coordination solution. This shows that in the extreme ends there are two archetypical forms of coordination. On the one hand there is a service process in which a low predictability requires high flexibility and leads to an archetype with relatively tight agreements, contracts and governance and loose coupling (e.g. through the use of events) at the technical level. The other end of the scale consists of an archetype in which a very predictable situation enables tight coupling of information systems based on steps in a process, and put less stress on agreements and other coordination mechanisms at the organisational level. This can even be a conscious strategy in situations that make agreements very difficult, as we have seen in the interview series. These two archetypes form the extreme ends on a scale in which a specific context of a situation renders a tendency towards the one or the other more applicable.

Samenvatting (summary in Dutch)

AFHANKELIJKHEDEN ONTRAFELD:

COÖRDINATIE VAN PUBLIEK-PRIVATE DIENSTVERLENINGSNETWERKEN

Veel overheidsorganisaties – zowel in Nederland als elders – proberen hun dienstverlening aan burgers en bedrijven te verbeteren. Vanuit het perspectief van de afnemer van een dienst bestaan veel dienstverleningstrajecten nu nog uit verschillende onderdelen die door verschillende afdelingen en organisaties worden uitgevoerd.

Overheden willen met behulp van ICT, hun diensten steeds meer geïntegreerd gaan aanbieden. Omdat voor de afnemer het dienstverleningstraject niet stopt bij de grens van een organisatie, moeten organisaties samenwerken. Sterker nog, vanuit de gebruiker bezien maken veel overheidsdiensten deel uit van een groter geheel waarin ook private partijen een rol spelen. Daarom wordt – in literatuur en praktijk – gesproken over een ontwikkeling die zich richt op meer samenwerking tussen publieke en private partijen op het gebied van dienstverlening. In de samenwerking van die, soms heel verschillende, organisaties brengt dit veel onderlinge afhankelijkheden met zich mee, onder andere op het gebied van informatiesystemen, gegevens en processen.

In dit proefschrift worden die verschillende afhankelijkheden in kaart gebracht en wordt verkend hoe hiermee kan worden omgegaan (door middel van coördinatie) om geïntegreerde dienstverlening door samenwerkende publieke en private organisaties te realiseren.

Probleemstelling

Het integreren van diensten is een enorme uitdaging, zelfs binnen één enkele organisatie. De veelal gefragmenteerde systemen moeten samenwerken en dat vereist interoperabiliteit. De uitdaging wordt groter wanneer dienstverleningsprocessen over organisatiegrenzen heen gaan. Interoperabiliteit is ook hierin de grote uitdaging en dat krijgt specifiek aandacht in onder andere e-government literatuur. ICT biedt daarin niet alleen de kans om dienstverlening te verbeteren, maar is ook een uitdaging.

De situatie is echter nog gecompliceerder omdat niet alleen de afhankelijkheden tussen stappen in een dienstverleningsproces een rol spelen. De betrokken organisaties hebben vaak een bepaalde autonomie, zeker waar het gaat om private partijen. Er zijn daarom ook afhankelijkheden op wat we het organisatieniveau noemen. Dit proefschrift richt zich op samenwerking tussen publieke en private partijen en niet op vormen waarbij de één de ander vervangt, zoals bij

uitbestedingrelaties. Dergelijke samenwerkingsverbanden zijn zeer intensief en vereisen niet alleen dat systemen samenwerken, maar ook dat organisaties op één lijn zitten en de dienstaanbieders gezamenlijk tot een geïntegreerd proces komen waarmee aan de vraag van de dienstafnemer voldaan kan worden.

De aanleiding van dit onderzoek is dat, ondanks dat zowel in praktijk als in de literatuur de ontwikkeling richting dienstverlening door samenwerkende publieke en private organisaties wordt beschreven, het onduidelijk is hoe om moet worden gegaan met de vele complexe afhankelijkheden die dergelijke dienstverleningsstructuren met zich mee brengen. In andere woorden: het is onduidelijk wat coördinatie behoeft in publiek-private dienstverlenings-netwerken en hoe dit vorm moet krijgen wil men gezamenlijke dienstverlening realiseren.

Aanpak

In hoofdstuk twee wordt beschreven hoe deze vraag te beantwoorden. De afhankelijkheden in publiek-private dienstverleningsnetwerken wordt op drie lagen (organisaties, processen en technologie) in kaart gebracht. Eerst verkennen we de coördinatie uitdagingen die ontstaan als de verschillende, wederzijds afhankelijke, elementen in zo'n netwerk samen moeten worden gebracht om diensten re realiseren. Vervolgens onderzoeken we hoe met de afhankelijkheden en de bijbehorende coördinatie uitdagingen wordt omgegaan in een specifieke casus over een publiek-privaat dienstverleningsnetwerk.

De belangrijkste methode van onderzoek is die van de case study. Hiervoor is gekozen omdat we 'coördinatie' willen begrijpen in de werkelijke context. Het isoleren van delen hiervan zou wellicht de validiteit van het onderzoek kunnen verbeteren, bijvoorbeeld door te zoeken naar correlaties tussen concepten echter, publiek-private dienstverlening beweegt zich in een complexe situatie, waarin vele variabelen een rol kunnen spelen. Aangezien er slechts een beperkt aantal netwerken voor het onderzoek beschikbaar zijn, hanteren we een case study methode voor twee cases. In de eerste case study inventariseren we de coördinatie uitdagingen. In de tweede case study onderzoeken we hoe coördinatie in de praktijk van een publiek-privaat dienstverleningsnetwerk vorm krijgt. Dit wordt onderzocht in een case over een Nederlands netwerk rondom de RDW, waarin publieke en private partijen nauw samenwerken om publieke diensten te leveren. In de tweede case study is een wat meer gestructureerde methode gebruikt dan in de eerste case, door het gebruik van een semigestructureerd interview protocol. Voordat we de diepte van de case in zijn gegaan, hebben we de breedte van mogelijke coördinatievormen in publieke dienstverlening in kaart gebracht door middel van interviews met vertegenwoordigers van andere publieke dienstverleners. Zowel de interviewserie als de case study zijn in hoofdstuk vijf beschreven.

Binnen al deze empirische stappen gebruiken we de drie eerder genoemde lagen. Feitelijk zijn dit elementen van een publiek-privaat dienstverleningsnetwerk, die we ieder als een soort van black box benaderen. Daarbij richten we ons op de afhankelijkheden tussen die black boxes. Dit stelt ons in staat om de coördinatie in deze netwerken uiteen te rafelen. Uiteindelijk worden de bevindingen van de cases en de interviews verwerkt in een raamwerk. Dat raamwerk bevat de belangrijkste onderling afhankelijke elementen in een publiek-privaat dienstverleningsnetwerk en beschrijft per element de belangrijkste coördinatie uitdagingen. Dit raamwerk maakt inzichtelijk aan welke afhankelijkheden en coördinatievraagstukken aandacht moet worden besteed wil men publiek-private diensten realiseren.

Theoretische achtergrond

In hoofdstuk drie bekijken we de theoretische achtergronden van publiek-private dienstverleningsnetwerken. Deze achtergronden vallen terug te voeren op een debat in de literatuur over management van de publieke sector. Kort gezegd vindt dit debat zijn oorsprong in de kritiek op het opereren van de overheid en de bijbehorende sterk bureaucratische structuur. Tegen deze achtergrond wordt een 'new public management' (NPM) voorgesteld. Dit NPM paradigma stelt dat overheden meer zouden moeten kijken naar hoe bedrijven opereren en daar een voorbeeld aan nemen. Daarbij zou de overheid zich moeten richten op haar kerntaken en verder zoveel mogelijk aan de private sector overlaten. In reactie hierop is er een stroom aan hedendaagse literatuur ontstaan over overheidshervormingen waarin wordt gesteld dat de traditionele overheidsstructuur ook zijn voordelen heeft. Het gaat hierbij dan vooral om het bewaken en realiseren van publieke waarden zoals gelijke behandeling en transparantie. Deze voordelen van een bureaucratische benadering worden goeddeels genegeerd in de NPM gedachte. De literatuur die zich tegen het harde karakter van NPM afzet, stelt (onder diverse benamingen) bestuurskundige modellen voor, waarmee de nadelen van de traditionele bureaucratie het hoofd worden geboden, terwijl tegelijkertijd de negatieve aspecten van NPM worden vermeden. Belangrijk onderdeel in deze literatuur is dat de rol van private partijen vooral als die van partner van overheden wordt geschetst.

Samenvattend stellen we dat de bestuurskundige literatuur op dit terrein neerkomt op een verschuiving van een idee van publiek versus privaat, naar een model dat zich richt op publiek én privaat om hedendaagse publieke vraagstukken te adresseren.

We combineren deze bestuurskundige achtergrond met ontwikkelingen op het gebied van ICT in de overheid; de zogenoemde elektronische overheid ofwel e-government. Deze e-government literatuur combineren we met de bovengenoemde literatuur over het functioneren van de publieke sector, de rol van private partijen daarin en de literatuur over netwerken als organisatievorm. Op basis van deze combinatie komen we tot een theoretische lens op de ontwikkelingen richting geïntegreerde

elektronische dienstverlening die worden geboden door netwerken met publieke en private partijen. Belangrijk element van deze lens is dat we dergelijke netwerken bezien als een systeem dat bestaat uit wederzijds afhankelijke elementen. Deze afhankelijkheden moeten worden gecoördineerd om de geïntegreerde diensten te realiseren.

Deze lens komt voort uit het gebruik van de coördinatietheorie. In die theorie zien we dat veelal wordt gekeken naar het afstemmen van afhankelijkheden die binnen een proces bestaan. Daarin is het vaak onduidelijk op welke manier de afhankelijkheden tussen organisaties en meer technische componenten het geheel beïnvloeden. Een deel van de literatuur hierover is erg algemeen (met name het idee dat netwerken gecoördineerd worden door middel van vertrouwen) of richt zich specifiek op operationele processen en de activiteiten daarin. Tegen deze achtergrond identificeren we het theoretische probleem van dit onderzoek, namelijk dat de eerste stroming te algemeen is en geen beeld schetst hoe gezamenlijke acties kunnen worden gerealiseerd, terwijl de tweede stroming weliswaar specifiek is, maar niet kijkt naar de afhankelijkheden die op andere niveaus dan het procesniveau spelen.

Uiteindelijk leidt dit tot twee stellingen. De eerste borduurt voort op het theoretische probleem en stelt dat het benaderen van coördinatie op één enkele laag te beperkt is om de afhankelijkheden en coördinatie in publiek-private dienstverleningsnetwerken goed in kaart te brengen. De tweede stelt dat netwerken als organisatievorm gelijktijdig en samen bestaan met de andere twee andere ideaaltypen: hiërarchie en markt.

Empirische stappen

De theorie schiet dus tekort waar het gaat om het bieden van inzicht in de coördinatie van publiek-private dienstverleningsnetwerken. Om dat inzicht op te doen, hebben we – in twee stappen – empirisch onderzoek verricht. In de eerste stap hebben we de coördinatie-uitdagingen in dergelijke netwerken, verkend in een realistische situatie. Omdat we een zo breed mogelijk inzicht wilden krijgen in de verschillende afhankelijkheden die zich in zo'n netwerk voordoen hebben we dit bekeken in een onderzoeks- en ontwikkelproject over een elektronisch portal voor het leveren van geïntegreerde diensten van publieke en private organisaties. Daarin hebben we zowel het proces van onderzoek en dat van de technische ontwikkeling onderzocht op de coördinatie-uitdagingen die naar voren kwamen. Tevens hebben we projectdeelnemers gevraagd naar de coördinatie-uitdagingen die zij zien of tegenkomen in de praktijk van hun organisatie. Deze projectdeelnemers vertegenwoordigen een aantal van de grootste Nederlandse overheidsorganisaties. Echter, die organisaties waren ten tijde van het onderzoek nog niet actief betrokken in publiek-private dienstverleningsnetwerken zoals wij die definiëren. Hun betrokkenheid bij deze haalbaarheidsstudie naar een publiek-privaat

dienstverleningsportal was daarom een uitgelezen kans om de coördinatie-uitdaging te verkennen die dergelijke gezamenlijke dienstverlening met zich meebrengt.

In deze exploratieve studie zijn twee scenario's gebruikt die dienst deden als specifiek toepassingsonderwerp voor het concept van het portal. In de beschrijving van deze exploratieve studie – in hoofdstuk vier – zijn deze scenario's en de samenstelling van het netwerk daarbinnen besproken als deel van de organisatorische situatie. De twee andere onderdelen die eerder zijn besproken - organisatie overstijgende dienstverleningsprocessen en het gebruik van ICT – voorzien in de rest van de structuur om deze casus te beschrijven. Binnen alle drie de onderwerpen hebben we gekeken naar de afhankelijkheden die naar voren kwamen. Op basis daarvan hebben we een aantal coördinatie-uitdagingen geïdentificeerd in deze exploratieve studie (zie tabel 1).

Als resultaat van de eerste exploratieve studie is er meer grip op de coördinatie-uitdaging in publiek-private dienstverleningsnetwerken. Het doel van dit onderzoek was echter tweeledig; naast begrip van de afhankelijkheden in deze netwerken is ook begrip van de coördinatie zelf een doel. Daarom hebben we ook onderzocht hoe in praktijk met de coördinatie-uitdaging wordt omgegaan. Deze tweede case study bestaat uit twee stappen. Eerst zijn de coördinatiemechanismen in kaart gebracht die organisaties gebruiken of identificeren om de afhankelijkheden in dienstverlening te coördineren. Dit hebben we onderzocht in een interviewserie met experts en mensen die zich dagelijks bezighouden met deze materie in overheidsorganisaties (de ene groep sluit de andere overigens geheel niet uit). In deze interviews hebben we de gesprekspartners gevraagd om een beschrijving van de wijze van coördineren van dienstverlening die zij identificeren. Dit is dus niet noodzakelijkerwijs beperkt tot publiek-private samenwerking, maar is gericht om een breed inzicht te verkrijgen in het speelveld van coördinatie van organisatie-overstijgende dienstverlening. De tweede stap is een case studie naar een publiek-privaat dienstverleningsnetwerk om te zien hoe dat netwerk wordt gecoördineerd. Bij beide methoden hebben we in de beschrijving vastgehouden aan het onderscheid tussen de drie elementen die we ook hebben gebruikt in de eerste case studie.

Het resultaat van deze verschillende stappen van empirisch onderzoek is dat zowel de coördinatie-uitdaging als de coördinatiemechanismen een breed veld aan wederzijdse afhankelijkheden beslaan, vanaf het organisatie-overstijgende niveau tot aan de technische facilitering van de interacties tussen de partijen en alles wat daar tussen zit. De coördinatie van het netwerk in de tweede case studie is gebaseerd op samenwerking, regelmatig overleg met partners, overeenkomsten, escalatieprocedures, relatie management, training van het middel-management, erkenning van partners, steekproeven, ICT applicaties en services met Service Level Agreements, een gedeelde basisregistratie van gegevens en meer. Daarnaast laat de

interviewserie zien dat in de situaties waarin actoren de coördinatie niet richten op alle lagen, dit ook een bewuste strategie kan zijn, bijvoorbeeld als het coördineren op organisatieniveau moeilijk is door politieke gevoeligheden. In het interview waar die situatie naar voren kwam bleek dat de coördinatie sterk gericht was op de basisdata om zo met de complexe politieke situatie om te kunnen gaan. De details zijn uitgebreid besproken in de twee hoofdstukken die over dit empirisch onderzoek gaan (hoofdstukken vier en vijf).

Een analytisch coördinatieraamwerk

De theoretische achtergrond en de bevindingen van de case studies zijn geaggregeerd in een coördinatieraamwerk voor publiek-private dienstverleningsnetwerken en worden besproken in hoofdstuk zes. In dit hoofdstuk duiden we de ontwikkelingen op het gebied van dienstverlening in termen van een klant-ontkoppelpunt. Dit is het punt waar het proces van de dienstafnemer (het klantproces) en het proces van de dienstverleners (het dienstverleningsproces) elkaar raken. De ontwikkelingen in de richting van gezamenlijke of geïntegreerde dienstverlening verschuiven dit ontkoppelpunt ten gunste van de dienstafnemer. Het onderliggende idee is dat veel dienstverleningsprocessen – vanuit het perspectief van de dienstafnemer bezien – interactie met meerdere actoren beslaat, zoals tussen organisaties, maar vaak ook tussen afdelingen binnen organisaties. De taak om de verschillende interacties met al deze verschillende actoren te ondernemen en onderling af te stemmen lag – en ligt vaak nog steeds – bij de dienstafnemer. De vele stappen worden door de individuele dienstaanbieder gezien als diensten, terwijl zij vanuit de dienstafnemer bezien slechts een deel zijn van een groter geheel. We zeggen dat het ontkoppelpunt dicht bij de dienstaanbieders ligt als de dienstafnemer – voor het verkrijgen van de totale dienst – met verschillende organisaties en afdelingen te maken heeft. Hoe meer dit ontkoppelpunt ten gunste van de dienstafnemer verschuift, des te meer afdelingen en organisaties 'achter' dit ontkoppelpunt vallen. In geval van geïntegreerde dienstverlening wordt de afstemming tussen de dienstaanbieders door die partijen zelf gedaan, wat de administratieve lasten voor de dienstafnemer reduceert maar de afstemmingslast voor de dienstaanbieders groter maakt. Daarin ontstaan vele afhankelijkheden die gecoördineerd moeten worden. Om het geheel hiervan in kaart te brengen is een brede blik op coördinatie nodig: organisatorische zaken spelen hierbij een rol aangezien ketenprocessen de grenzen van de autonome partijen voorbij gaan. Dergelijke partijen hebben soms andere belangen en waarden, gebruiken andere en veelal gefragmenteerde systemen en gebruiken andere data, of dezelfde data op een andere manier. Die brede blik wordt gevangen in het coördinatieraamwerk (figuur 10).

Het coördinatieraamwerk is geënt op de drie lagen die zijn afgeleid van de algemene, wederzijds afhankelijke elementen waarin ook de cases zijn gestructureerd:

organisaties, processen en informatiesystemen. Deze gelaagde aanpak draagt bij aan het begrip van afhankelijkheden en coördinatie in publiek-private dienstverlening door middel van:

- het uiteenrafelen van afhankelijkheden;
- het identificeren van coördinatie uitdagingen;
- het analyseren van coördinatie.

In het raamwerk zijn de drie bovengenoemde elementen opgenomen met de daarbij behorende coördinatie-uitdagingen die ontstaan in het omgaan met de afhankelijkheden tussen de elementen. Daarnaast worden de afhankelijkheden tussen de lagen zichtbaar gemaakt (verticaal) en hoe de lagen organisatiegrenzen overstijgen (horizontaal). Uiteindelijk bestaat het raamwerk uit drie hoofdlagen en negen sublagen, waardoor de verwevenheid van coördinatie in publiek-private dienstverleningsnetwerken ontrafeld kan worden. De individuele lagen worden in detail besproken in hoofdstuk zes.

Op basis van dit hoofdstuk stellen we dat niet alleen een brede blik op coördinatie nodig is, zoals vertegenwoordigd in de lagen, maar ook dat de lagen zelf onderling zijn verweven. Om te zien in hoeverre het raamwerk ook bruikbaar is om deze constateringen in andere dan de in de cases onderzochte situaties te zien, passen we het raamwerk toe op twee archetypische situaties.

Het raamwerk in praktijk gebracht

Om te zien hoe het raamwerk gebruikt kan worden, passen we het toe op twee situaties. Eerst op een simulatiegame, waarin we bekijken hoe de organisatorische setting bijdraagt aan de coördinatie-uitdagingen in vrij eenvoudige dienstverlening. Ten tweede bekijken we de verwevenheid tussen organisatorische en technische afhankelijkheden in een demonstratie van een op events gebaseerde servicegerichte architectuur. Het doel van die architectuur is om het zwaartepunt van de coördinatie te leggen op de interfaces tussen de technische componenten. De technische koppeling is daarom erg 'los'. We kijken daarbij hoe dit de andere lagen beïnvloedt. Het gevolg van deze vorm van losse technische koppeling is dat er strikte afspraken op organisatieniveau nodig zijn. Door de losse technische koppeling gaan deze afspraken vooral over de output van het proces, niet op de manier waarop het wordt uitgevoerd. Beide aspecten worden besproken in hoofdstuk zeven.

In de game wordt een dienstverleningssituatie nagebootst in een beperkte en gecontroleerde omgeving. Het raamwerk is daarin gebruikt om te analyseren wat er mis gaat in de coördinatie van de afhankelijkheden die in die situatie bestaan. Omdat het een niet-technische game is (het is een rollenspel), gebruiken we het raamwerk om met de deelnemers te bespreken hoe de inzichten van dat raamwerk gebruikt kunnen worden om de problemen te zien en het hoofd te bieden. Om hier te komen

zijn er een aantal typische coördinatie-uitdagingen bewust in het spel gebracht (zie hoofdstuk zeven). Deze uitdagingen gaan onder andere over het spanningsveld tussen autoriteit en autonomie en het omgaan met een verouderd informatiesysteem. In totaal zijn er vijf sessies van de game gespeeld. Daarin gaven de deelnemers aan dat het raamwerk nuttig was om de afhankelijkheden te zien. De game toont de spanning tussen enerzijds de traditioneel hiërarchische structuur van overheidsorganisaties en anderzijds de autonomie van andere partners in het netwerk goed aan. Daarnaast werd het verkregen inzicht over de onderlinge verwevenheid van de lagen, zeer gewaardeerd door de deelnemers.

Waar het raamwerk, ook in de toepassing in de game, voornamelijk een analytisch instrument is, wordt het meer heuristisch ingezet in de technische demonstratie. Die demonstratie toont aan dat voor zeer complexe processen, de koppeling tussen de verschillende stappen in het proces zeer dun kan worden gemaakt om op die manier de vereiste flexibiliteit te leveren. Door het raamwerk te gebruiken wordt hierin duidelijk dat hiermee het zwaartepunt van de coördinatie verschuift naar het organisatieniveau.

Conclusies

Tenslotte worden op basis van de bevindingen voor de onderzoeksvragen, drie hoofdconclusies geformuleerd. Ten eerste concluderen we dat netwerken niet naast, maar tezamen met hiërarchie en markt als andere basisvormen van organisatie bestaan. Ten tweede wordt de conclusie getrokken dat de afhankelijkheden in een publiek-privaat dienstverleningsnetwerk kan worden ontrafeld door middel van het gelaagde coördinatieraamwerk. Ten derde concluderen we dat het ontrafelen van de afhankelijkheden het inzicht biedt dat de verschillende lagen in het raamwerk zelf ook onderling afhankelijk zijn. We bespreken deze drie conclusies kort hier; het volledige argument staat in hoofdstuk acht.

Met de eerste conclusie draagt het onderzoek bij aan het debat over hiërarchie, markt en netwerken als ideaaltypen van organisatie. Netwerken zijn daarin niet een volledig aparte vorm, maar bestaan tezamen met de twee andere vormen. Deze conclusie is gebaseerd op de verschillen tussen publieke en private partijen, met name waar het gaat in de omgang met andere organisaties. Overheden zijn daarin veel hiërarchischer, waarbij mechanismes als autoriteit een belangrijke rol spelen. Bij private partijen spelen echter marktmechanismen, zoals prijs en contracten. Een netwerk vervangt deze basisvormen niet, maar brengt ze samen. Omdat alle drie de vormen verschillende coördinatiemechanismen met zich meebrengen, toont dit onderzoek aan dat mogelijke conflicten terug te voeren zijn op de verschillende organisatievormen die, gelijktijdig, in deze netwerken aanwezig zijn.

De tweede conclusie heeft betrekking op de eerste theoretische stelling, zoals die aan het eind van hoofdstuk drie wordt geformuleerd. Deze stelling behandelt dat de

huidige zienswijze van de coördinatietheorie ofwel te algemeen, ofwel te beperkt is. Op basis van de onderzoeksvragen concluderen we dat het bezien van coördinatie op één enkele laag niet voldoende inzicht geeft in de complexiteit van de afhankelijkheden in publiek-private dienstverleningsnetwerken. Procesgerichte coördinatie doet onvoldoende recht aan de relaties tussen partijen en de autonomie van organisaties. Daarnaast doet coördinatie gericht op relaties tussen partijen onvoldoende recht aan de moeilijkheden bij het omgaan met verschillende informatiesystemen en lastige processen die moeilijk definieerbaar zijn. Ook het algemene beeld dat bijvoorbeeld vertrouwen een belangrijke rol speelt, vertelt onvoldoende hoe de specifieke afhankelijkheden die ontstaan bij gezamenlijke dienstverleningsprocessen het hoofd kunnen worden geboden. Door het raamwerk te gebruiken zijn verschillende uitdagingen te zien voor het coördineren van geïntegreerde dienstverlening. Het raamwerk weerspiegelt dat deze coördinatie-uitdagingen en –mechanismen gevonden kunnen worden op verschillende niveaus en niet los van elkaar gezien kunnen worden. ICT-ondersteunde, geïntegreerde dienstverlening heeft dus een gedifferentieerde blik op coördinatie nodig; gezamenlijke dienstverlening vereist samenwerking en afstemming op alle niveaus.

Tenslotte, de derde en laatste conclusie gaat over de verwevenheid tussen de technische kant van het netwerken en de noodzaak om afspraken te maken tussen organisaties. Op basis van deze verwevenheid concluderen we dat afhankelijkheden ook tussen de verschillende niveaus bestaan. Deze bevinding wordt gesterkt door de bevindingen in de interviews die in hoofdstuk vijf zijn besproken. Met name geïnterviewde personen die in een federaal systeem werken, gaven aan dat in sommige situaties met veel politieke moeilijkheden er bewust is gekozen om in bepaalde situaties de afhankelijkheden te coördineren op het niveau van de data. Een te nauwe blik op coördinatie zou hierin alleen waarnemen hoe de afhankelijkheden tussen data worden gecoördineerd, maar door middel van het raamwerk is nu ook waarneembaar dat dit een manier is om de uitdagingen op het niveau van het netwerk van organisaties het hoofd te bieden. De coördinatie-uitdaging op die laag is groter dan die op de data-laag, waarbij het raamwerk in staat stelt de keuze te maken voor een vorm waarin de totale coördinatie-uitdaging het kleinst is.

Curriculum Vitae

Bram Klievink was born in Ravenstein, the Netherlands, on November 25, 1982. After secondary school, he studied Business Information Systems at Avans Hogeschool in Den Bosch (Avans University of Applied Sciences). He did a graduation internship at the Information Management Office of Tilburg University and graduated in 2004, resulting in a Bachelor degree in engineering (ing.). During his study, Bram got more and more interested in socio-organisational issues. Combined with an existing interest in politics, the 'logical' next step was to study Political Science at Radboud University Nijmegen, where he graduated in 2006, resulting in a Master of Science (MSc.) degree.

In 2007, Bram started as a PhD researcher in the ICT (Information and Communication Technology) section of the Faculty of Technology, Policy and Management at Delft University of Technology. During this period, he participated in the B-Dossier project (2007), a combined research initiative with partners from government, business and academia. The project aimed to support integrated, demand-driven electronic services from public and private organisations to citizens and businesses. Furthermore, he participated in the Kanalen in Balans project (2007-2009), aimed at finding solutions for the multichannel management problems of government organisations. He was also involved in teaching in both the Bachelor and Master programmes of the faculty.

Bram published close to 30 peer-reviewed articles in journals, conferences and books. This resulted in two awards. Papers were published in, amongst others, Government Information Quarterly, IEEE Intelligent Systems, the International Journal of E-Government Research, and Information Polity. Furthermore, he has written a variety of professional publications and research reports.

From 2008 to 2010, Bram acted as a member (secretary) of the board of the Dutch Alliance for Vital Governance (Alliantie Vitaal Bestuur - AVB), a strategic research alliance for collaboration and knowledge transfer between two Dutch Ministries, the Dutch Tax and Customs Administration, five Dutch Universities, and three applied research institutes. The focus is on the overlap between information- and communication technology, innovation and the public sector.

Since 2009, Bram continued his teaching activities and started new research activities while staying in the same department at TU Delft. The new research focuses primarily on complex interdependence in networks of government authorities and commercial parties in global supply chains. The current research activities are conducted as part of two European projects and one national project.

UNRAVELLING INTERDEPENDENCE

Coordinating Public-Private Service Networks

Governments aim to improve service delivery towards citizens and businesses. One of the main trends in this area is that organisations are increasingly trying to integrate service delivery by using information and communication technology (ICT). Service integration is necessary as individual service offerings are often just a part of a bigger process. This overall process does not stop at the boundaries of individual organisations, or at the boundary between the public and the private sector.

Therefore, in order to improve service delivery, the service providers have to collaborate and integrate their services across organisational boundaries. The challenges that these collaborations face are varied, including heterogeneous organisations, a variety of processes, and fragmented information systems.

How can we deal with these challenges to realise integrated service delivery? It is this question that is the background of this dissertation. It is addressed by exploring the interdependence in integrated service delivery, provided by networks of public and private organisations. Ultimately, the dissertation improves the understanding of the coordination of such public-private service networks.

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