A Balancing Act

Defining a control-oriented approach to public sector agility

Academic Paper

Ferre Westermann
Delft University of Technology
Faculty of Technology, Policy & Management
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Controlling public sector agility

The importance and implications of interfaces

1. Introduction

Upcoming challenges related to dynamic change on the forefront of technological, economic and climate related issues, in combination with the failure of old policy paradigms has been demanding the public sector to innovate. Traditional waterfall methods often proved ineffective since late changes made projects go overbudget as the initial plan was based on a lack of information which sometimes simply could not be known upfront. This situation led to new concepts of adaptive governance which better deal with complex and uncertain issues that unfold in a multi-actor arena given their incremental nature (Janssen & Van Der Voort, 2016; Luna-Reyes & Gil-Garcia, 2015; Nelson, Howden, & Smith, 2008; Nograšek & Vintar, 2014; Weerakkody, Janssen, & Dwivedi, 2011). An example of one of those concepts is agility which finds its roots in software development and provides a stark contrast to traditional waterfall decision-making models. Its incremental development process embodies a learning-by-design method which generates required information throughout the process (Balter, 2011). It therefore prevents projects from making late and costly changes and allows for creating quality closely related to stakeholders' needs while playing into topical change.

The use of agility, however, brings substantial implications. Fridman (2016) indicated the use of agility in itself already can bring complications as there is less predictability and lack of documentation while requiring more time and commitment and placing greater demand on both developers and the client and other stakeholders. The main paradox of agility is thus that even though agility appears at odds with control, it is required for agility to be effective. When furthermore considering the clear contrast between agility's self-organization and fast-paced adaptiveness and hierarchical centralized control, sectarianism and red tape in bureaucracies one might wonder if agility is even suitable for the public sector in the first place as its approach to control appears to provide its exact opposite.

This paper explores the implications of using agility in public sector bureaucracies and the interplay between the different types of control associated with both concepts. It indicates that the presence of many interfaces adds to the complexity of the agile process and thus the required control. This has especially repercussions for planning which is a main aspect of public sector bureaucratic control due to the external deadlines faced. The paper furthermore states that bureaucratic means of control such as centralized visions and planning can go hand in hand

with agility in public sector organizations or are even required to prevent loss of control due to the many interfaces present in the agile process.

First, the paper discusses the background of control in public sector bureaucracies along with its resistance to innovation while concluding that agility has the potential to overcome such barriers and provide a means of incremental innovation to the sector. Then the research approach and methodology are presented before the influence of interfaces on control over the agile process is discussed. The paper ends with recommendations and a concluding section.

2.1 Public sector bureaucracies, control and innovation
2.1.1 The awaited turn to post-bureaucracy

According to Weber (1958) bureaucracies have three main characteristics to perform with speed and unambiguity: hierarchy, rules and strict procedures (red tape), and specialized technical competence. They are furthermore considered to be related to a political decision-making body, while they embody concentration of administration or material resources (Max Weber, 1978). At the end of the 20th century scholars noted the need for a transition to 'post-bureaucracy' which would put flexibility and the human element at the center due to increasing public dissatisfaction (Ventriss, 2000) and scholar's criticism (Basu, 1994) regarding inefficiency and red tape that typified public sector bureaucracy. A shift was envisioned towards autonomy and teamwork through increased collaboration, trust and decentralization and reduction of formal structures and centralized control (Clegg, 1990; Cooke, 1990; Heydebrand, 1989). Parker and Bradley (2004), however, already indicated that control and hierarchy of the bureaucracy in the public sector did not make way for post-bureaucracy around the turn to the new millennium due to new forms of control on monitoring performance, such as benchmarking and financial controls (Farrell & Morris, 1999). Parker and Bradley then already stated that "instead of a shift from bureaucracy to post-bureaucracy there is rather a shift from one form of bureaucracy to another, not associated with less control but with different mechanisms of control" (p.212).

An important aspect of the performance-based mechanisms is the presence of strategic planning within public sector bureaucracies (Vigado-Gadot, 2003). Johnson (2015) lays out how the debate on centralization and central planning versus decentralization and incrementalism has been ongoing since the end of the Second World War and showcases through case studies that out of the different schools of thought stated by Mintzberg, Ahlstrand and Lampel (2009), such as power, positioning and learning, the planning school is most present as a means of control. While the emphasis on planning is related to external deadlines regarding legislation Johnsen

states it is a "paradox that the public sector extensively uses strategic planning where the organisations often are professional bureaucracies and the environments are unstable." (p.262) while he also remarks that planning is needed since there is "policy ambiguity, demands for openness, attentive publics, time problem, and shaky coalitions" (p.264). This indicates that both planning and flexibility is desired in the public sector.

Next to the presence of planning the bureaucratic hierarchical nature of public sector organizations persisted throughout the years (Bontis, 2007; Hazlett, McAdam, & Beggs, 2008; Marilena & Elena-Mihaela, 2008) which more specifically can be characterized given the following characteristics. Public sector organizations have rather complex inter-organizational structures (Rashman, Withers, & Hartley, 2009) while staff members are considered as important repositories of knowledge (McAdam & Reid, 2000) which means that transferring across departments, which occurs often, leads to a loss of tacit knowledge (Marilena & Elena-Mihaela, 2008). Public sector bureaucracies furthermore still have relative lack of autonomy (LaPalombara, 2001; McNabb, 2007), high presence of political accountability (Kothari, Hovanec, Hastie, & Sibbald, 2011) and risk-aversive cultures (Bontis, 2007; Ferguson, Burford, & Kennedy, 2013; LaPalombara, 2001). These together indicate that a turn to more autonomous and human-oriented type of bureaucracy did not yet take root and large-scale innovation was off the table.

2.1.2 Public sector bureaucracies and innovation

There is, however, a desire for innovation due to stakeholder expectations (Rashman et al., 2009) such as the general public or politics, aim for cost-reduction and increase of efficiency (Larsen, 2015; McAdam & Reid, 2000) and recognition to make use of technological developments (Moussa, McMurray, & Muenjohn, 2018). As the previous paragraph already indicated there are certain characteristics of public sector bureaucracies which provide barriers to innovation such as the risk-aversive culture. Further impediments are the blockades to information flow by command-and-control structures and red tape (Chiem, 2001), vertical hierarchies (Marilena & Elena-Mihaela, 2008), bureaucratic sectarianism and performance measures (Sørensen & Torfing, 2011), poor reward mechanisms, lack of time, constraining culture and failure to halt failing projects (Mulgan & Albury, 2003; Vigado-Gadot, 2003). That some of these, such as inadequate communication, centralized hierarchical control, lack of resources, risk- and change-aversiveness and sectarianism, were already noted by Kanter (1984)

indicates how these aspects are firmly rooted into public sector bureaucracies and are challenging to overcome.

2.1.3 Types of innovation in the public sector

While Van de Ven et al (2008) define innovation as a dynamic journey Stewart (2010) distinguishes between three types of innovation: incremental, radical and systemic. Incremental innovation entails that minor improvements are made "to existing products or services and in so doing meet standards for regulation compliance" (Wagner & Fain, 2018, p. 1207), radical innovation entails rather disruptive change by replacing old with new systems and therefore bares a higher likelihood of risks and costs, while systemic innovation is primarily driven by developments within the used technology. While radical innovation can be very beneficial public sector organizations generally tend to avoid it given its inherent risks and potential costs of failure (Luke, Verreynne, & Kearins, 2010). Walker (2007) and Stewart (2010) on the other hand states that for public sector organisations the use of incremental innovation is the most desired as it better aligns with regulatory responsibilities and mandates while Sørensen and Torfing (2011) also applaud use of an incremental manner in the public sector given its potential for long-term foresight.

2.1.4 Innovation as and through agility

This is where agility comes in as a potentially successful form of innovation since incremental adaptation basically captures the essence of the approach. Agility in itself is not a thought-through detailed framework but rather a concept that is widely used and has been given different definitions in different contexts (Luna, Kruchten, & de Moura, 2015). In itself it is merely a set of values and principles which comes from the 'Manifesto for Agile Software Development', written by a group of representatives of software companies in the beginning of the 2000s (Beck et al., 2001). At the core stand the following four values:

"Individuals and interactions over processes and tools;
Working software over comprehensive documentation;
Customer collaboration over contract negotiation;
Responding to change over following a plan."

Table 1: The four values of the Agile Manifesto

For this article, the definition of agile projects specified to the following. Agile projects:

1. Focus on the deliverance of **value** and acknowledge the requirements are not known up-front but will be **learned** during the **incremental** process through **short cycles** and continuous **evaluation and adaptation**

2. Focus on keeping things **simple** and only include what is **necessary** and **efficient** to meet the retrieved **requirements** which **change during the process**.

3. Bring **human interaction and collaboration** to the forefront, both through **team facilitation, self-organization** and **daily interaction** in the development process and **stakeholder collaboration**.

These characteristics of agility also provide a hypothetical strong case for succeeding in bringing innovation to the public sector. Multiple scholars indicated that innovation depends on an organization's ability to manage internal and external cooperation to exchange ideas through free flow of information to create value and reduce the previously stated barriers and allocate resources in such a manner which facilitates these actions (Agolla & Van Lill, 2013; Ingraham, Joyce, & Donohue, 2003; Walker, 2007). The concept of agility serves to promote cooperation within an organization and with its stakeholders while eliminating barriers by focusing on simplicity, efficiency, and speed. It has furthermore been indicated that decentralization and self-organization foster innovation (McMillan & Carlisle, 2007; Rashman et al., 2009; Wynne & Otway, 1983) which are also core elements of agility. Besides, agility finds its root in software development and has clear linkage to IT. Since Kim et al (2014) indicated that IT innovation can help overcome red tape procedures and sectarianism in bureaucracies the potential of agility to improve public sector organizational effectiveness through new means of control becomes an even stronger case.

Together these factors indicate the potential agility has to foster innovation in the public sector while simultaneously providing a new form of control which bridges the performance-based control with the post-bureaucratic need of flexibility.

3. Research approach and methodology

The research uses an explorative approach to identify the potential implications of public sector bureaucracy characteristics on control over the agile process. By combining an extensive theoretical study (see Appendix I) with a case study the research explores the distinction

between control mechanisms related to 'pure agility' and those specifically required given public sector characteristics. A single embedded case study approach was chosen given its potential for the required in-depth explorative research (Yin, 1994) which was performed at a program of one of the main executive institutions of a Dutch Ministry. Management already indicated the need for research on how to enhance control over the agile process given previous undesired developments. As the agile process had been ongoing for about 1.5 years it provided a suitable case given the rich experience of desired control in the past while also focusing on the challenges still at hand. The author conducted 17 semi-structured interviews as this allowed for explorative research within a certain pre-defined framework (Rubin & Rubin, 2011). The interviewees included staff members ranging from team to higher management with, for instance, Scrum Masters and a Deputy Director. The interviews furthermore represented both the business and technology interests given the associated roles in agility. Three validation sessions were performed at the Dutch Sociale Verzekeringsbank ('Social Insurance Bank') and another main Dutch public executive institution. Together the organizations involved in the research, while varying in size, provided a representative selection of important national executive institutions of the Dutch public sector.

4. Control over public sector agility

4.1 Similarities theory and practice

The case study provided clear links to the findings of the theoretical study when it comes to control mechanisms to be used. All identified clusters from the theoretical research were present as represented in table 2. A separate thesis report related to this paper contains more information on the mechanisms incorporated in each cluster. Agility aims to have the agile process itse;f function as the main control mechanism. While agility in itself is not a method or framework, it should be noted that the statements made are generally related to some of the main methods associated with agility such as Scrum and SAFe. Regular events with strict procedures are meant to create simplicity and transparency in the process while roles with clear responsibilities and tasks add to the simplicity and predictability of the cooperation in which feedback and checks and balances between business interests and technology are incorporated in the process.

Agile leadership	Organizational set-up
Agile mindset and skills	Portfolio and budge
Continuous adaptation	Teams and roles
Collaboration and feedback	Technology and tools

Events and procedures	User and stakeholder interaction

Table 2: Control clusters present in theory and practice

From the similarity between the theoretical findings and practice one can already state that agility in the public sector has a clear connection to what theory prescribes which is promising for its use within the public sector. Certain aspects, however, proved challenging such as the agile mindset and also the linking of traditional functions to new roles. Training and education on agile skills and mindset is crucial while the departments in charge of certain roles should generally be equipped with the desired knowledge and skills. In general, the case study illustrated that while the control clusters stated above all provide valuable recommendations on internal control over the agile process their specific mechanisms should be tailored to the organization's context and interests. Besides, as the following paragraph discusses, there are also other substantial implications which need to be taken into account when using agility within public sector organizations.

4.2 Discrepancy theory and practice

The case highlighted new themes as control clusters which were not identified in the theoretical study and can be contributed to the characteristics of public sector bureaucracies. These themes are related to the following points:

1. The interaction with interfaces which increases the complexity of agile process.
2. The need for planning and the implications this has on performing control.
3. The difficulty of the specification of requirements which is rather different than what the business is used to in waterfall projects.
4. The need for clear visions that provide insight into:
    a. The current and future desired functioning of agility in the organization and departments
    b. The specification of requirements and their prioritization by setting direction on to be developed products
5. The interaction between agility and top-down waterfall structures

This paper elaborates on the implications the many interfaces bring to the agile process and its control since it has far reaching implications on the agile process and all of the other observations stated above.

4.3 Interfaces in public sector agility

There can be many interfaces in the agile process, for instance with other system applications, departments, or development teams. The dependencies with interfaces are so present since the value stream in public sector bureaucracies is in general cut up over different departments and systems. Agility presumes a smooth value delivery stream of client-to-client process as one uniform structure but this stream is broken up in public sector organizations given their traditional organization into functions. This distinction is visualized in figure 1.
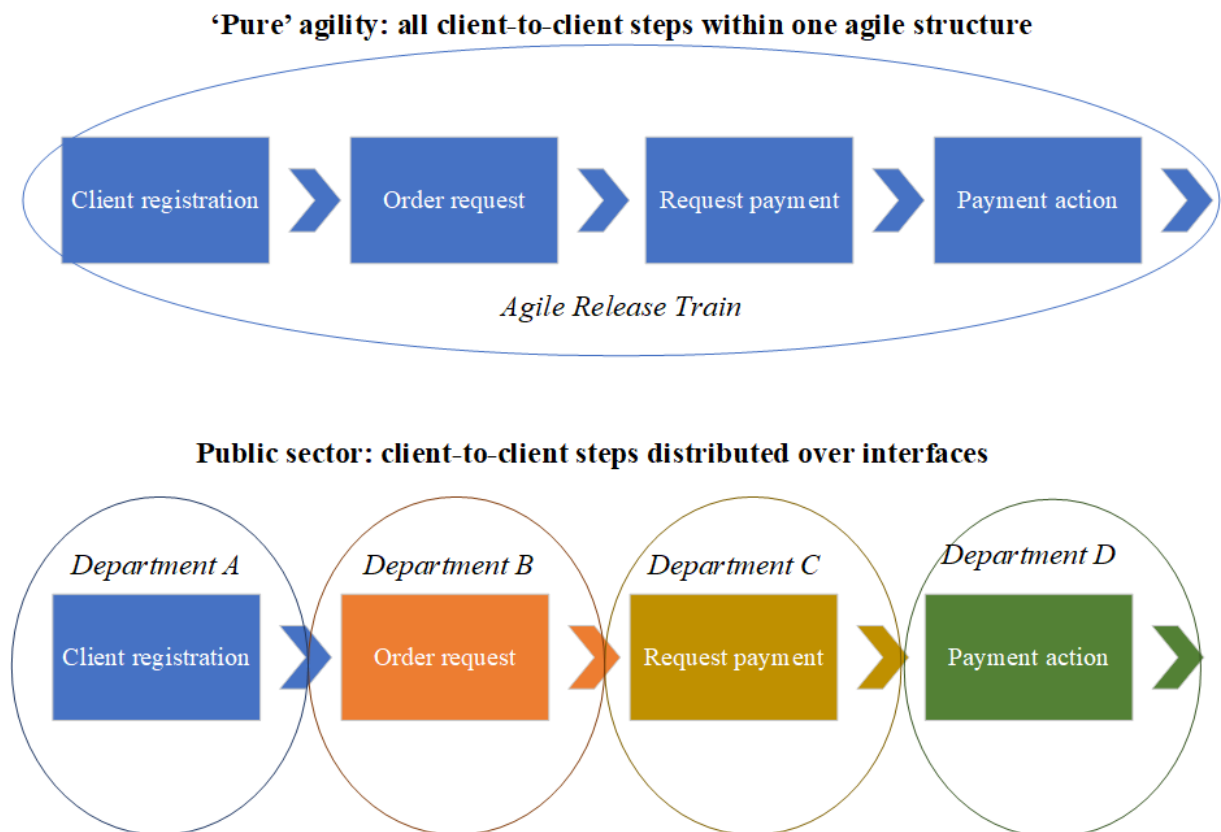

Figure 1: Simplified example of interfaces breaking up the client-to-client process

These interfaces can play an important role in the agile process as they allow for more flexibility and can increase speed but from the findings of the interviews it became clear this process is currently not under control due to three reasons.

1. Interface dependencies generally lead to delays given lack of capacity or due to the interface working in a waterfall method which cannot respond that fast to changing needs.

2. Interface dependencies add complexity to the to be developed product as they bring their own input requirements so new developed increments correspond interfaces.

3. Some of the interfaces are associated with legacy systems which are being replaced (or will be over time) which means that development should also take interface developments into account as expanding on legacy systems only increases the complexity to replace it later.

From these observations it becomes clear that interfaces bring such substantial implications to the agile process that separate control mechanisms are required to prevent grave delays, ensure input for requirements, and do not increase dependencies on legacy systems.

5. Increasing control within interface complexity

This chapter discusses four types of control which should be used to overcome the barriers to cooperation interfaces create or to prevent loss of control over an agile process due to development in its interfaces. They relate to overcoming sectarianism within public sector bureaucracies, incorporating interface interactions in planning, ensuring creating a strategic vision on renewal programs and priorities, and shaping the organizational structures to reflect the value delivery stream.

5.1 Overcoming sectarianism in public sector bureaucracies

The case study illustrated that the sectarianism is present in practice as indicated in the literature. Given the dependencies between departments and teams it is important to overcome these island structures as agility requires cooperation to coordinate dependencies and provide input on requirements for the development process. While interviewees indicated that agility already helps in itself to overcome barriers between department and increase cooperation it was also stated that this mainly relates to staff working on the team level since there is more competition present at the management layer. While further measures seem required there are certain mechanisms inherent to agility which already aim at overcoming such barriers.

Methods commonly associated with agility such as Scrum and SAFe provide structured approaches in which there are events in which stakeholders participate to receive information on developed increments and in turn give feedback to further guide the development process. When the stakeholders at these events represent the interfaces this already provides one set-up which can be used to increase the control over stakeholder involvement in the agile process. There should furthermore be one or two persons, Product Management in SAFe, active on the program layer in charge of stakeholder engagement. By keeping the contact points limited to a

couple persons it is ensured there is a concentration of knowledge regarding interface dependencies and wishes which can directly be translated to the Program Backlog which in turn is used to guide the Product Backlog on team levels. One of the ARTs in the case used 13 Product Managers given the many interfaces at hand. This is rather problematic since this created a situation where the interests of interfaces might be represented within Product Management, but there was no translation of such desires into the Program Backlog and thus to be developed product since there was not one Product Manager clearly in charge over the process.

Even when the set-up of agility should hypothetically work just fine it can be that cooperation of interfaces is still hampered by the present sectarianism. Another possibility is that the interfaces are interested in such cooperation but are not taken along by the department in charge. Process Management (De Bruijn, Ten Heuvelhof, & In 't Veld, 2010) and Management in Networks (De Bruijn & Ten Heuvelhof, 2008) provide valuable recommendations which can be used to facilitate cooperation between parties while acknowledging their strategic interests and respecting their core interests. Adaptive governance, an umbrella approach under which agile governance can be placed, also recommends the use of such mechanisms to increase stakeholder understanding and cooperation (Janssen & Van der Voort, 2016). While the approaches provide a multitude of options, the following can be regarded as essential for increasing the trust currently absent between parties while also making the process interesting to engage with. Firstly, the agile process can be considered as a multi-issue game where different topics are discussed and timing is crucial in case of sensitive or contested decisions since a process does not evolve around one clear decision but embodies a multitude of smaller increments which together form the final product. Secondly, according to theory sense of urgency should be created to ensure stakeholders are interested in participating in the agile events. Especially for departments or teams using waterfall methods which might not be as excited about agility it is important to show the benefits of participating. Furthermore, the agenda can be altered to match the process with relevant interface developments. A third important mechanism is to create a fair process since the case study indicated a clear lack of trust between departments. Parties should be aware of each other's core interests and there should be clear rules of the game for which the agile events, procedures and roles can be used as a basis.

5.2 Incorporate interface interactions in planning

While interfaces can contribute to flexibility and fast development in agility this is currently not to be expected in public sector bureaucracies given a lack of capacity or waterfall methods used in such interfaces. The case study showed that planning, like stated in the literature, is an important control mechanism in the public sector given the need to meet external deadlines for implementation of legislation. It was, however, also shown that interfaces generally lead to delays when a component of the development or testing is required of them which in the case of agility can even mean sprint goals are not met with when there is delay of just a couple of days. Interactions with interfaces should therefore be planned beforehand to the extent possible which might seem contradicting for agility but does not have to disrupt the process. It does not mean that the precise content of the request is known beforehand, an interface interaction can already be planned when it is clear some form of dependency will occur. This also means that if it is known beforehand an interface is only available at a certain time since it is fully booked for the rest of the agenda the agile teams or an ART should adapt to this if it else brings substantial delays. Another implication interfaces bring regarding planning is that when they change their teams the predictability changes which is also problematic for planning. Since the value stream is broken up over multiple departments this is also expected to happen if no further measures are taken. To control cooperation with interfaces when it comes to planning and team stability departments might want to make extra agreements to explicitly mention what is required of who at what time.

5.3 Creating a strategic vision on renewal programs and priorities

Given the many interfaces at hand there are a lot of interests embodied within the agile process. Without strategic vision on prioritization there is no clear direction to the process but reacts to whatever comes up that moment. This itself might not seem like an issue in general as agility aims to be adaptive but it becomes problematic in the public sector where a Minimum Viable Product (MVP) should be ready before the deadline. A strategic vision on priorities is therefore needed to guide this process. The vision should, however, not only focus on prioritization of upcoming deadlines but should also illustrate which renewal programs will be initiated when. Renewal programs to replace legacy systems are an important facilitator for agility and efficient development in the public sector in general since the adding increments to legacy systems makes it an even bigger challenge to replace it to generalizable modular increments which allow for fast development. While updates in interfaces can bring delays in the development, an unanticipated renewal program can substantially change the required functionality or

architecture of a service and might demand alteration of already developed increments. An organizational strategic vision which incorporates both prioritization of deadlines and renewal programs thus enhances the control over the agile process since meeting deadlines will not be threatened by unexpected technical changes and upcoming projects might be deliberately used as windows of opportunity to combine with such renewal programs.

5.4 Shaping the organizational structures to reflect the value delivery stream

A final recommendation orients at the interfaces themselves. Enhancing control can be performed by limiting the complexity that rises due to interfaces through eliminating the need for interfaces in the first place. When the organizational structures are set-up to resemble the value delivery streams the interfaces between departments increase and the required capacity is placed internally within an ART or other form of agile organizational structure. A vision for organizational change over time is valuable for such a transition as this allows for the necessary training and education agility requires. Yet, it should be recognized that such an organizational set-up appears rather utopian on the short-term for most contemporary public sector bureaucracies. The vast presence of interfaces and especially those between waterfall and agile teams are expected to persist in the near future.

6. Conclusion

Agility is increasingly being used in the public sector so it can be more flexible and play into technological developments and changes in contemporary societies. While it seems like a promising concept to help public sector bureaucracies overcome their sectarianism and seemingly ineffecient centralized hierarchical control to achieve such adaptiveness, it therefore also provides a clear contrast to current types of control which typify public sector organizations. To explore the conflict and potential synergy between control in public sector bureaucracies and that incorporated within agility the paper presents the findings of a theoretical study and single embedded case study at a main executive institution of a Dutch Ministry.

The results indicated that while the control mechanisms associated with 'pure agility' find resonance in public sector agility, it also becomes clear that further control is required for agility to fit the public sector. A main influencer to the agile proces is the vast presence of interfaces which exist since organizational structures are generally set-up to functions rather than to resemble the client-to-client value delivery streams agility aims for.

To increase control over the agile proces in public sector bureaucracies these interfaces should be cared for. Firstly, the sectarianism between department as potential external stakeholders should be aimed to be decreased. While agility already demands closer cooperation and therefore brings parties together, more is needed to increase trust between parties for which process management and management in networks provide valuable recommendations, such as related to creating a fair process of interaction in which parties' core interests are protected. While interfaces can be used for flexibility and fast development their dependencies can also bring substantial delays to the agile process given a lack of capacity or waterfall methods used. Given the importance of planning as a means of control in the public sector due to external deadlines sector the interactions with interfaces should therefore be planned to the extent possible. Thirdly, there should be a strategic vision on renewal programs and priorities on the organizational and program level to prevent loss of control over the direction of the agile process. Lastly, to decrease the complexity of interfaces organizations can aim to have their organizational structures better reflect the value delivery streams.

While the paper indicates the presence and inluence of interfaces on the agile process their actual implications differ per program given the organizational context and program requirements. As the paper embodied a rather explorative approach it provides recommendations which are valuable for awareness raising but might need to be specified more for different contexts. Research should therefore be performed on presence, implications and required control over interface ineractions which includes multiple public sector organizations to identify trends and provide more tailored recommendations.

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Appendix I: Theoretical Study

For the theoretical study, control mechanisms were identified by analyzing thirteen different management methods and frameworks categorized into four application areas: agile oriented methodology, agile project and portfolio management, adaptive and agile governance, and stakeholder interaction. Together, these provide insight into the control mechanisms inherent in the agile approach while also providing potential complementing mechanisms from other approaches. The following table provides an overview of the methods and frameworks.

Agile oriented methodology	
DevOps	A framework originating from software development which links development and operations change with a focus on automation and monitoring (G. Kim, Debois, Willis, & Humble, 2016).
Holacracy	A management model in which team members self-organize within determined rules, roles and customer demand (Robertson, 2007).
Kanban	A method often used in Scrum to help manage product development processes which entail continuous delivery in a visual manner while aiming to enhance flow and limit the amount of work in progress (Sutherland & Schwaber, 2013).
SAFe	A framework which can be used to apply scaled agility on not only a project, but also program, portfolio, or larger solutions level (Scaled Agile, 2017).
Scrum	An iterative and incremental agile framework with clear roles, short communication lines and development sprints (Sutherland & Schwaber, 2013).
Agile project and portfolio management	
Agile portfolio management	A management approach which links an agile project with the overall strategy and tactical execution of other related individual projects (Chin, 2004).
Agile project management	A management approach which focuses on agile team dynamics, tools and measurements for success (Crowder & Friess, 2015).
Conditions agile project management	An approach to agile project management to consider whether agility is suitable for an organization and the relevant project (Chin, 2004).

Adaptivity & agile governance	
Adaptive governance	A governance approach in which balancing between adaptability and stability is required while building ambidextrous organizations which embody, accept and address conflicting interests and values (Janssen & Van Der Voort, 2016).
Agile (project) governance	Two conceptual frameworks which focus on the dimensions of agile project governance, such as steering, controlling, system states and laws of interaction (Lappi & Aaltonen, 2017; Luna-Reyes & Gil-Garcia, 2015).
Stakeholder interaction	
Process management & Management in Networks	Approaches which focus on managing the process of decision-making in a versatile multi-actor network with competing, while focusing on the dilemmas at play and factors that support or block change (De Bruijn & Ten Heuvelhof, 2008; De Bruijn, Ten Heuvelhof, & In 't Veld, 2010).

Table A1: Overview of analyzed management theories and frameworks