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**Exploring Public-Private-Collaboration in German eGovernment Projects -
Assessing Perceptions, Drivers and Barriers**

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Abbreviations

AI	Artificial Intelligence
DESI	Digital Economy and Society Index
EC	European Commission
EU	European Union
GDP	Gross Domestic Product
G2B	Government to business
G2C	Government to citizens
G2E	Government to employees
G2G	Government to government
ICT	Information and Communication Technology
OAA	Online Access Act
PPC	Public-Private Collaboration
PPP	Public-Private Partnership
RQ	Research question
SME	Small- and medium enterprises

Symbols

N	Number of individuals
I_{pri}	Private sector interviewee, i = number of interviewee
I_{pui}	Public sector interviewee, i = number of interviewee

1   Introduction

While Estonians can use almost every online service regardless of their location (e-Estonia 2022), Germans are still waiting for their public administration to go online. Although Germany is among one of the most developed nations and the third biggest economy in the world (IMF 2023), it is underperforming in the provision of digital public services in the European Union (EU). It is positioned 18th among the 27 EU member states in the Digital Economy and Society Index (DESI). Moreover, when examining the proportion of its citizens using digital public services, its performance deteriorates to the 24th rank (DESI 2022). Despite the current government's plan to be ranked among the top ten countries within the DESI index on digital public services by 2025, the current status does not reflect these intentions (Bundesregierung 2023; Felden et al. 2023). Numerous legislative measures and governmental strategies that aimed to accelerate the provision of electronic Government (eGovernment) applications have failed as expectations are not in line with reality (Halsbenning 2021; Kuhlmann and Bogumil 2021). It should be noted that eGovernment is not only the provision of digital public services; it includes a wide sphere of public administration. It aims to improve administrative processes and communication with the help of digital solutions (Yildiz 2007). For instance, services such as the possibility of online payments or the registration of a car online (Mergel 2019). But also internal processes need to become digital in order to make the external online provision of public services possible.

The introduction of eGovernment applications is not only integral due to the developments in Information and Communication Technology (ICT) in the past years; the evolvement of public administrations and their responsibilities shapes the efforts. Despite of ICT enabling the provision of eGovernment, the public sector is confronted with more demanding challenges that require higher levels of technical expertise. Consequently, public administrations are reaching their limits (Vorgel and de Marné 2002).

To overcome these challenges, sectoral cooperation is becoming essential (Arendsen et al. 2011; Lenk et al. 2022). Partnerships of the public sector with non-governmental stakeholders seem promising and needed. The task to innovate and digitalise the public sector needs various actors, especially private sector partners (Lühr 2021). This can also be seen in the German public sector; the vast majority of local level governments wish for more support in digitalisation matters (Initiative Stadt.Land.Digital 2020). Even among higher level governments, 59% wish for private partners as supporting actors. In 2019, more than 60% of the local level governments used external consultants or local

companies to help with the implementation of digital matters. Although less used, non-local companies are still in use by more than half of the governments.

Especially, public-private-partnerships (PPPs) are an established option in various countries (Goede 2019; Petrone 2021). Such partnerships between the public and the private sector can differ in their degree of collaboration and in their contractual arrangements (George et al. 2024). Thus, multiple levels of collaboration are possible. While some PPPs are closely associated with outsourcing activities, others take a more collaborative approach, in which public and private entities develop their ideas together (Liu et al., 2020). Nevertheless, requirements and characteristics of PPPs are changing. The scope of tasks and structures becomes wider when developing adapted forms of collaboration between the public and private sector. Researchers increasingly perceive difficulties in the separation of various forms of the two sectors working together (Quélin et al. 2017). Since the terminology of the concept is evolving and diverging all the time, this research refers to this as public-private-collaborations (PPCs). By using this term, the wider range of possible public and private collaborations is appreciated, that aim to establishing public services and address public sector challenges (George et al. 2024). Hence, this research refers to PPCs throughout the further course. The concept of PPCs is broad, encompassing several forms of collaborating. In Germany, IT procurements are often used. Such procurements are often consulting and software development services (BMWK 2023).

Contradicting the growing importance of PPCs and the implementation of eGovernment in public administration, the existing academic literature seems to be rudimentary (Irún et al. 2020). While both literature strings are well researched, the combination in the context of Germany lacks in research efforts. Especially since German public administration is lagging behind other EU countries, Mergel (2021) stresses the digital transformation to be a compelling matter. With the important role of private actors in eGovernment efforts, more knowledge is necessary to understand these dynamics (Yildiz 2007). Demands for further research are also brought up by other scholar as "a deeper inquiry into and understanding of their underlying hybrid nature" is necessary (Quélin et al. 2017, p. 767).

Therefore, research focusing on PPCs in eGovernment projects in Germany is necessary in order to form a deeper understanding of their environment and their role in the digitalisation of the public administration. With ICT becoming more relevant, the insights are urgent. Hence, this research aims to address the following two research questions:

RQ 1: How do the public and private sectors in Germany perceive Public-Private-Collaborations in the realm of eGovernment projects?

RQ 2: What are the drivers and barriers for Public-Private-Collaborations in eGovernment projects in Germany?

Both research questions focus on PPCs in the context of projects that aim to enhance eGovernment in Germany. The objective of research question (RQ) 1 is to analyse the perceptions of the public and the private sector for PPCs in eGovernment initiatives in Germany. Hereby, four categories are studied: the understanding of PPC as a context, positive, and negative perceptions as well as the future role of private companies in eGovernment initiatives. With the urgent matter of eGovernment, the results might lead to new insights. Moreover, special emphasis is devoted to the factors and conditions that influence the forming and the operation of these collaborations in RQ 2: the drivers and barriers. Both can be encountered by PPCs throughout their whole lifecycle. Although there is academic research on the drivers and barriers of PPCs, most of it is conducted in the context of construction and building activities. Taking a varying perspective, with eGovernment in this case, allows to see context specific drivers and barriers. Hence, the reasons and factors encouraging such collaborations are analysed through the drivers. Barriers, on the other hand side, are necessary to understand why such projects might become complex and have the potential to fail. Further, they explain why some stakeholders may opt-out of these collaborations. Since both sectors, the public and private, are essential to the collaboration, both perspectives are incorporated and identified.

This research uses a qualitative and explorative research design to answer the two research questions of how both the public and private sector perceive public-private collaboration in Government projects in Germany and what the driver and barriers for such collaborations are. For this, 14 semi-structured interviews with 15 participants were conducted in the data collection phase and analysed through coding afterwards. The interviewees experience PPCs in their day-to-day professional activities. The public employees work for German cities which have between 100.000 and 480.000 inhabitants. The local level is chosen as this level has the most responsibilities in implementation tasks as stated in section 3. Private sector interviewees are all based in Germany, with most of them working for German entities. Due to the aforementioned lack of relevant literature, explorative research is suitable to combat both research questions. Due to this, explorative research is suitable to understand the RQs in depth while being open to various elements of the interviewees' perceptions and experiences. This research does not incorporate other

forms of PPCs such as collaborations with research organisations, non-profits, and citizens. Neither is it researching on PPCs with foreign entities.

The findings of this research intend to contribute to a more thorough understanding of the context and circumstances that PPCs and their stakeholders face in the specific context of Germany. It provides insights into the spheres of such collaborations and contributes to the existing literature by studying the perceptions of employees from both sectors and identifying the influences for such collaborations. While the perceptions of PPCs remained positive and stable among the interviewees, the importance of the collaboration's necessity is highlighted throughout the interviews. The need is mainly driven by the qualitative and quantitative resource constraints and the need for efficiency gains. The collaborative efforts are hindered through a lack in project know-how and legal challenges. Organisational and cultural structures as well as disparities between the public and private sector function as ambivalent factors. Through the findings, this research aims to enhance PPCs. As public and private perspectives are incorporated, the major stakeholders are interviewed. This contributes to an enhanced understanding between the sectors and provides scholars with a variety of starting points for future research.

The next section comprises a literature review that presents the current research on eGovernance and PPCs. Adding to this, the institutional context is introduced, elucidating Germany's public administrative system in combination with the context of the topic at hand in Germany. Section four elaborates on the used methodology, in which the research's approach is presented. Following this, the results are presented, aiming to answer the presented research questions. A subsequent section follows, discussing the results and the implications for both research and practice. Ultimately, the research is concluded, limitations are described and ideas for potential future research are provided.

2 Research background

This section represents the current status of the literature. In this context, the major databases Scopus, Web of Science and Google Scholar were used to search and identify relevant literature. During this process, journals and conference papers were filtered based on their quality as well as their thematic suitability. Within three main sections, an overview of the terminology of eGovernment is presented, followed by a broader section on PPCs with a definition and types, along with their benefits and drawbacks. The third subsection gives particular attention to literature with a niche focus on PPCs in eGovernment in order to bring both principles together.

2.1 eGovernment

This section provides an overview of the concept of eGovernance, including a brief explanation of its development and the primary obstacles it faces.

2.1.1 Definition and concept of eGovernment

The concept of eGovernment has evolved over the past decades. Even in periods when the term itself was not yet coined, scholars recognised the potential of utilising technology in government. In their publication from 1986, Bozeman and Bretschneider (1986) discuss the use of Management Information Systems in the public sector. The concept of eGovernment became more prominent around a decade later. Although the first appearance cannot be fully verified, Heeks and Bailur (2007) estimate the introduction of the word electronic governance in 1993 in the U.S. National Performance Review. According to the scholars, e-government as a term first became prominent in 1997. Despite the term being used for almost three decades, it is always evolving.

The looseness of the eGovernment concept is still evident. This becomes visible when assessing academic literature (see Aldrich et al. 2002; Yildiz 2007). Nonetheless, the majority of scholars define eGovernment as "a government's use of ICT, particularly Web-based Internet applications, to enhance the access to and delivery of government information and service to citizens, business partners, employees, and other agencies and entities" (see Layne and Lee 2001; Ogonek et al. 2016; Wang and Liao 2008). This definition originates from Associate Director of the U.S. General Accounting Office, David McClure, in 2000 (Layne and Lee 2001). While not emerging from an academic source, it is widely acknowledged and utilised in the academic environment.

Even other definitions show parallels. Meijer and Bekkers (2015) distinguish between eGovernment as a *set of techniques* and eGovernment as *a practice*. eGovernment as a

set of techniques focuses on its significance as a catalyst for the advancement of the public sector. Considering eGovernment as practice emphasises "the use of ICT in order to design new or to redesign existing information processing and communication practices in order to achieve a better government." (Meijer and Bekkers 2015).

The European Commission (EC) perceives eGovernment as the combination of the use of ICT by governmental bodies and a component indicating a changing behaviour and the rethinking of organisations and processes (European Commission 2006). With this, public services should be delivered more efficiently to the citizens. For the EC, eGovernment bares the hope to interact more easily and faster with the government while being more cost efficient. This definition sets the focus on the use of ICT to enhance the delivery of information and services to a public system's users.

The main objective of eGovernment efforts, is to "improve public services, democratic processes and public policies" (European Commission, 2006) by making use of information and communication technology. Additionally, organisational changes and the advancement of skills play an integral role (European Commission, 2006). Various advantages are listed, ranging from cost savings to efficiency gains but also to social benefits by designing the public sector more user-friendly (Sharma 2007; Witte et al. 2019).

The main stakeholders that are affected by eGovernment are citizens, private companies, and the government. Hereby, the complexity around the different stakeholders becomes clear. Three different dimensions of eGovernment are commonly referred to in literature (see Wang and Liao 2008, Evans and Yen 2006): government to government (G2G), government to citizens (G2C) and government to businesses (G2B). Other scholars, such as Ndou (2004) and Rao (2011) include employees of the public sector to the main stakeholder groups (G2E). The interaction with eGovernment of each of the stakeholder group differs according to Jaeger (2003). The author perceives citizens to be mainly affected by eGovernment advancements. Next to increased participation and enhanced services and processes, information can be accessed more easily. Besides these compliance duties, G2B can also include digital procurement processes. Benefits such as less transaction costs can occur as efficiency is raised. Moreover, possibilities for collaborations with the government can be made better available for the public. In G2G relations, the communication can be among various governmental levels as well as across departments. According to Jaeger (2003), G2G eGovernment has benefits such as increased efficiency and proficiency in information sharing. G2E is internally driven by digital services for civil servants such as human resource management or training (Rao 2011).

Public authorities are one of the main influences to implement eGovernment applications. While eGovernment itself has potential to enhance service delivery and enforce democratic standards, the opposite might happen. The drawbacks of eGovernment should not be overlooked. Public authorities can take advantage of the technologies by surveilling and controlling citizens' movements (Lindgren et al. 2019).

2.1.2   Stages of eGovernment

The stages of eGovernment unveil the scope and broad dimensioning of eGovernment initiatives. This is integral to understand the RQs presented in the introduction. Herewith, the conceptual application of the notion of eGovernment is concretised.

Over the past decades, various researchers have tried to divide the differences in eGovernment efforts into stages (Ingrams et al. 2020; Layne and Lee 2001; Scholta et al. 2019a; Siau and Long 2005). Layne and Lee (2001) set four stages in the early days of eGovernment. Due to this, it is one of the most cited papers for eGovernment stages. Their model consists of two axes: the y-axis representing increasing technological and organisational complexity behind eGovernment, while the x-axis reflects increasing integration efforts. The model itself is shown in Figure 1.

In Layne's and Lee's (2001) model, the first stage is the so-called catalogue stage. Within this, the state is building up online access to information such as websites. Subsequently, the second stage, the transaction stage, changes the manner in which citizens engage with the government. As citizens are demanding an increase in online engagement, they can be served through eGovernment. Public services, such as filing taxes, are now available online.
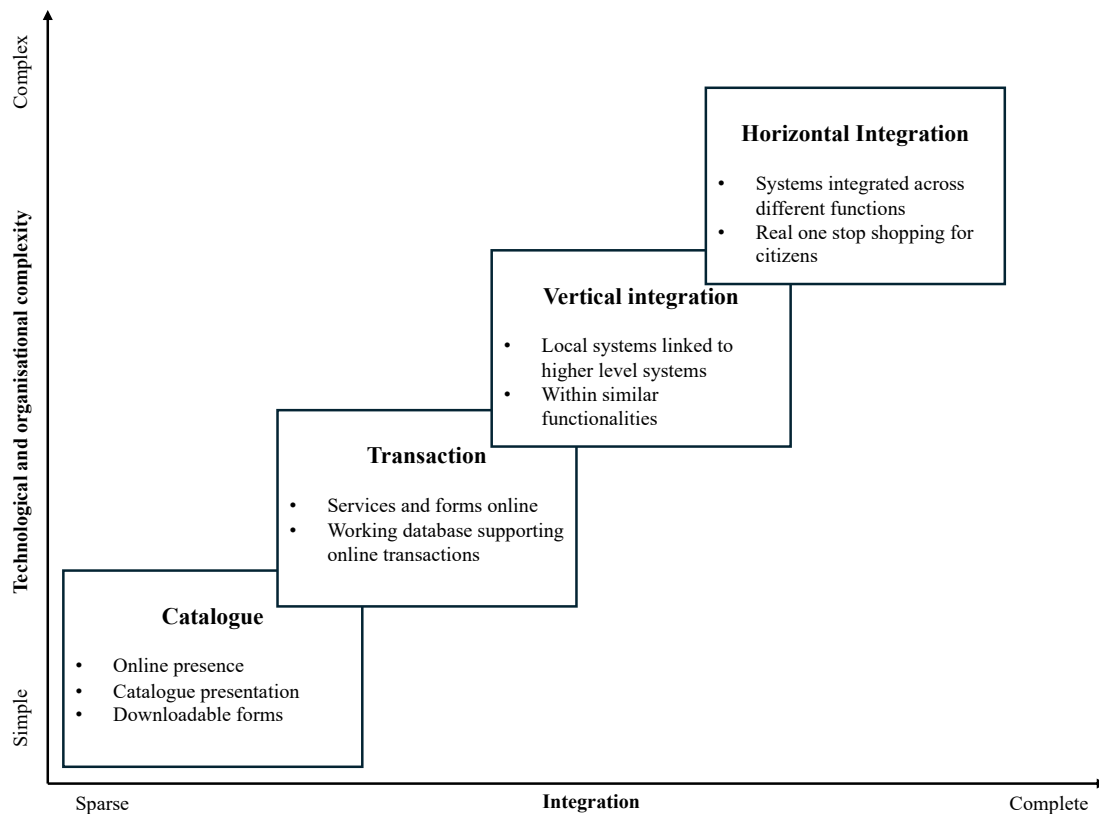
Figure 1 Dimensions and stages of eGovernment development. Derived from Layne and
Lee (2001)

The last two stages are about the vertical and horizontal integration. Both stages have a
significantly higher complexity than the first stage as well as strive to complete the
integration of eGovernment. Vertical integration needs the various levels of government
to be linked, especially when concerning similar functions. Unlike the previously
mentioned two stages which addressed the automatization and digitisation of existing
services, this stage aims to transform governmental services. The fragmentation of
different levels of government is supposed to be resolved by connecting and interacting
across these levels. An example given by Layne and Lee (2001) is the application for a
business license. Here, the citizen hand in their data locally and the application is
transmitted throughout all necessary levels of government. The last stage is the horizontal
integration. This refers to the integration across functions and the establishment of a one
stop shop for citizens. Within this stage, integration happens across functional silos,
meaning that various services can be managed through one point of access. Andersen and
Henriksen (2006) extend this model by shifting the focus to the front-end of the processes
and the citizens by adding activity and customer centric stages to the model.

However, Scholta et al. (2019a) are not considering the end of eGovernment by realising
a one-stop shop. Their models start with a one-stop shop but continue to a limited no-stop

shop and end in a no-stop shop. The ladder provides proactive citizen services to citizens as the government anticipates upcoming needs. The citizens do not need to fill out forms or provide other data to the government. The middle option, namely the limited no-stop shop, provides proactive citizen services while still needing various information from the citizens. Certainly, all these stages bring challenges with them. These are presented in the next section.

2.1.3 Challenges of eGovernment

Even though the growth of eGovernment is crucial globally, certain challenges and barriers cause divergences in its implementation among countries and regions. Studies from the early 2000's report an at least partial failure rate of more than 50% (Anthopoulos et al. 2016).

The reasons why eGovernment projects fail are manifold. Nonetheless, the challenges of implementing eGovernment remain consistent over the years. In their publication from 2001, Layne and Lee discuss technical as well as managerial challenges. While heterogenous databases and requirements play a part at the technical side, managerial challenges are related to a change in mindset of leaders in governmental institutions. They criticise the established "silo" structure of agencies, referring to managers who perceive their agency as the most important. This might result in difficulties when trying to implement eGovernment projects or even obstructs them. This, however, is not beneficial in terms of efficiency neither is it citizen-friendly (Layne and Lee 2001).

Ogonek et al. (2016) see more complexity in the reasons. For them, next to the availability of technology, suitable and committed staff with expertise is vital for the success of such projects. Then, this does not solely refer to managerial staff; especially the role of street-level bureaucrats is often neglected in research. Their perceptions and behaviour shape the success during the implementation phase of such projects (Snellen 2002).

Scholta et al. (2019a) experience shared challenges across countries. Investigating Estonia, Austria and Australia, all nations shared the division of power in government and thus the resulting fragmentation of government as a barrier. According to them, this shows to be one of the main barriers especially in the context of objectives and interoperable processes and systems. Moreover, legislation plays an integral part to eGovernment efforts. It has been visible that all three countries experience difficulties in data privacy and security measures (Scholta et al. 2019a). The reasons for the divergences across different regions are less well researched. Ingrams et al. (2020) found in their global longitudinal research across 100 countries that population size, GDP and regional competition have a positive correlation at all stages.

Additionally, the adoption of eGovernment services of citizens seems to be a challenge, addressed by various scholars. Li's and Shang's (2020) study reach out to the citizens' value perception of eGovernment services. They conclude that perceived value acts as a link between service quality and the intention to continuously use the online service. For instance, if a service's quality is good, but citizens do not believe in its benefits, this service will not be used often. In their findings, the perceived value of an online service is dependent on how much the eGovernment system improves effectiveness, inclusiveness, and democracy. Malodia et al. (2021) observe that citizen-oriented strategy leads to the most positive effect on the success of eGovernment initiatives. Their research observes that this in turn fosters trust in the government and enhances the use of eGovernment services. However, when trying to enhance eGovernment services, new challenges arise. Although the concept of proactive service delivery seems desirable, it comes with various challenges. The need for citizens consent impedes the implementation as not all citizens may approve of it (Scholta et al. 2019a).

Challenges can also have societal roots. The digital divide of a society negatively influences the adoption of eGovernment initiatives (Malodia et al. 2021). The digital divide can be understood in mainly two dimensions; the divide of having access to technology and the divide in the ability to use and understand technology and information. Therefore, countries with an extensive digital divide must not solely invest into IT on its own but also into the advancement of digital skills for citizens and public sector employees, leading to split resources (Malodia et al. 2021).

Ultimately, the use of ICT in government cannot be generalised as beneficial or harmful. Lindgren et al. (2019) considers the way public organisations apply these technologies to be crucial in determining whether the impact on citizens is positive or negative.

2.2 Overview of Public-Private-Collaboration

This section provides an overview of PPCs and its corresponding concepts. As mentioned in the first section, this literature review draws upon various literature streams related to PPCs, such as PPPs, public procurement, hybrid public-private and public-private interaction.

2.2.1 Defining PPC

PPCs have been in use for centuries. For instance, in ancient Rome, the state implemented a practice known as "tax farming." Private people have been delegated the task by the state to collect taxes from the public (Levi 1989). The extent of the state needing private companies has grown ever since (Wettenhall 2010).

Notwithstanding the fact of its long existence, Hodge and Greve (2007) argue that the concept lacks in clarity. With an increasing interest in research, the complexity around it becomes evident. The definition used in this research is provided by George et al. (2024). The scholars define PPCs "as organizational arrangements where relevant services or investments result from the joint action of public and private actors with varied degrees and types of engagement and responsibility" (p.12). This definition leaves room for various types of PPCs, ranging from corporations to service arrangements to state-side support from the public sector within private fields.

Taking a closer look at the concepts of public and private within this definition, both concepts describe bureaucratic organisations with differences in their goals, structures, and governance virtues (Kivleniece and Quelin 2012). While public actors are usually established or owned by the government and receive most of their funding from the government's side, are private entities in private ownership (Wamsley and Zald 1973). Although there are some entities which can have elements of both, most organisations belong to one of the types (Rainey 1983).

The third part of the term PPC, collaboration, lacks a common definition (O'Leary and Vij 2012). Oftentimes, the terms cooperation and coordination are discussed in the same setting as collaboration. The scholars criticise its conceptual weakness, also in relation to other concepts such as coordination, cooperation, collaborative governance, and many more:

> "The multiple terms, meanings, and implications are overlapping, elusive, and unclear, leading to inconsistencies in the nomenclature." – O'Leary and Vij (2012, p. 517)

"Varied degrees and types of engagement and responsibility" (George et al. 2024, p. 12), refers to the involvement of each actor throughout a collaborative effort. Usually, the degree and type are set beforehand within a contract with various possible options (Haller 2019). Typically, joint effort is less present in such forms. However, O'Leary and Vij (2012) make the author responsible for the providing a shared definition during their research effort.

As briefly mentioned in section 1, the borders between PPCs and PPPs are not always clear. This is due to the wide range of PPP contextualisation and its definitions. This in turn depends highly on 1) the scholars, 2) the research's environment and 3) the regions these are operating in, as the definition of PPPs can vary profoundly. Western European countries use a neath meaning, highly connected to risk sharing and private financing, in the context of infrastructure projects. On the contrary, the definition in the United States

is commonly a wider one, covering various instruments to involve private companies to pursue public sector goals (Skelcher 2009). Such differences of varying PPP definitions are also echoed by other scholars. Savas (2000) elaborates on PPPs at three different levels, of which the first one covers any arrangements of the public and private to deliver goods and services, while the other two cover complex infrastructure projects, with the third referring to formal collaborations to improve urban conditions.

2.2.2   Scope of PPC

Whereas the chosen definition in this research includes various types of PPCs, so does the literature. While Roehrich et al. (2014) elaborate on the spectrum of PPCs without service contracts, Liu et al. (2020) name four stages of PPC that the scholars observe in their research: outsourcing, service co-delivery, joint management and collaborative governance. The closer both actors work together, the closer they get to the collaborative governance stage. The duration usually depends on the project and the level of collaboration among the stakeholders. Besides this, the risk allocation of the partnership and the cost arrangements are subject to the contractual agreements which are stipulated in advance between the partnership's stakeholders (Haller 2019). Additionally, it is seen as an instrument that encourages synergies and development (Liu et al. 2024).

As this research focuses on the definition provided by George et al. (2024), the details in scope are presented in the following. The scholar provide a figure, which is is illustrated below as Figure 2. The illustration is adapted from Roehrich et al. (2014), who focus on PPPs and the varying degrees of such. George et al. (2024) elaborated further on it, with the figure now functioning as a theoretical basis within this research. The spectrum is divided into three main areas: the first and third area, both of the exteriors on the graph, are prone to less collaboration. The upper part is driven by major public responsibility, while the lower part is mainly driven by private responsibility with only support mechanisms by the opposing actor, the public sector. The second main area, the middle part, shows hybrid partnerships between the public and private actors. Here, the public and private partners share the responsibilities for the duties worked on. However, it is evident that collaborative efforts within this area can take various characteristics and designs as well.
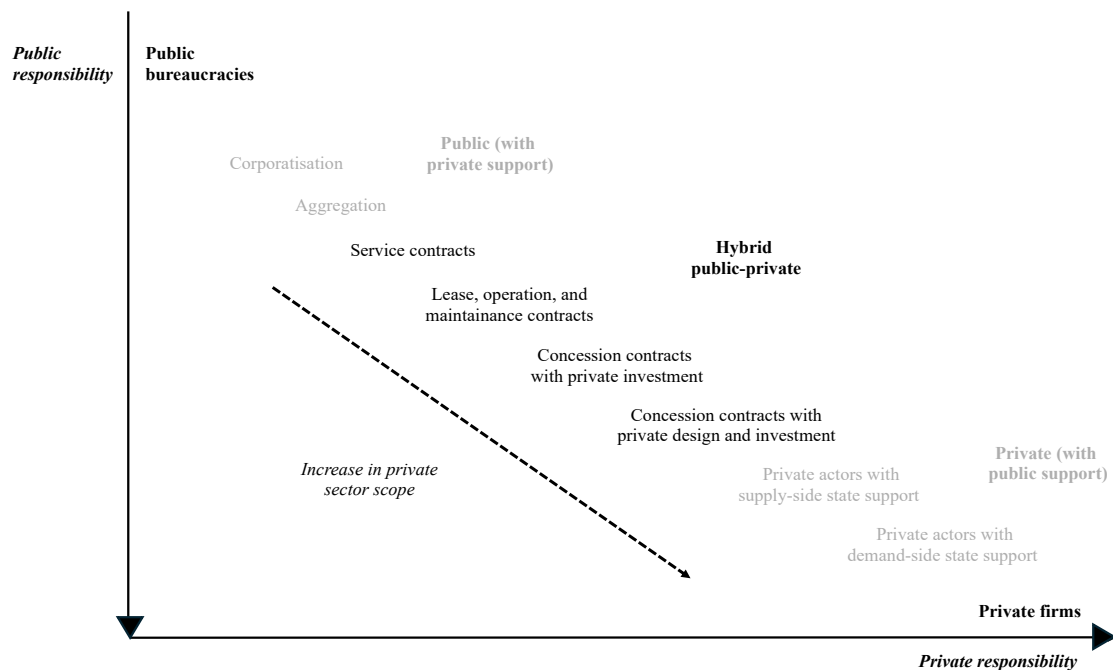
Figure 2 The spectrum of public-private-collaboration. Derived from George et al.
(2024). Adapted from Roehrich et al. (2014)

As this research focuses mainly on hybrid public-private collaborations, this will be discussed in further detail in the following. George et al. (2024) introduce four models: Service contracts, lease, operation and maintenance contracts, concession contracts with private investment and concession contracts with private design and investment. These hybrid public-private collaborations aim to provide a public service with private actors. The four presented types vary in the involvement and responsibility of each actor (George et al. 2024)[1]:

- Service contracts: the government procures goods and services from private entities. This is especially done to benefit from private sector expertise and efficiency. This is often referred to as externalisation or outsourcing. However, these concepts have also varied definitions. According to O'Leary and Vij (2012, p. 509) outsourcing is "by its very nature, […] a collaborative endeavour".

- Lease, operation, and maintenance contracts: these contracts can range from technical support to the operation of a product or service or maintenance of it. The government invests in the project.

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[1] This research focuses on the first two types: service contracts and lease, operation and maintenance contracts. However, within practice, theory is not fully projectable and might vary. For more details on collaboration examples that are referred to in this research see section 5.1.1.

- Concession contracts with private investment: the private sector is engaged in the public sector, even financially. Typically, these projects tend to last for more than 10 years.

- Concession contracts with private design and investment: Within this model, the private sector is highly engaged. Hereby, the private player is integral as it also plans the project's infrastructure.

As already discussed, the notion of PPC is not standardised. More and more new types of collaboration are emerging, due to changing interacting and interdependence of the actors (Quélin et al. 2017). This leads to the development of concepts in which PPCs might also include actors that are excluded in section 1. Alongside private sector firms, several authors include citizens and non-profit organisation, such as research institutions, in the definition (Callens and Verhoest 2024; Leite and Ingstrup 2022). While this brings its own characteristics, this point of view is neglected.

2.2.3 Benefits

Next to their contractual characteristics, the reasons why public organisations make use of PPCs are manifold. Current literature evolves around three main benefits of PPCs. Alongside the cost optimisation and efficiency gains, capacity, and resource building as well as increased flexibility play a crucial role.

By moving towards a more competitive approach, private sector competition is enforced (Caldwell et al. 2005). Through the use of contracts and procurement procedures, which are commonly used in the EU, PPC can be more efficient than governmental provision as market standards are enforced. By doing so, it allows governments to control the costs and allocate their resources to market conditions (Bloomfield 2006; Reichard 2006; Savas 2000). Connecting to this, PPCs can lead to cost reductions. Yet, this is highly discussed in literature. Savas (2000) explains this phenomenon, when compared to in-house service provision with a reduction in staffing and new management regimes. Additionally, governments that are pressured in terms of costs can make use of PPCs to allocate their financial resources (Hodge & Greve 2017). Besides this, the allocation of risks towards the private partner are further benefits (Haller 2019).

Alongside the finances and risks transfer, the necessity of using PPCs for governmental duties due to resource constraints should be noted. Collaborating with the private sector helps to overcome human resources constraints within the public sector (Capdevila and Zarlenga 2015; Roehrich et al. 2014). Human resources constraints not only involve the availability of employees, but also the knowledge and expertise of employees. For

instance, Gasco-Hernandez et al. (2022) stress the necessity for the involvement of private companies concerning certain technologies such as Artificial Intelligence (AI). Expertise in such fields is rather scarce in governmental agencies. Therefore, PPCs are beneficial regarding the knowledge transfer. This is due to the specialisation private sector stakeholders can achieve and bring to projects (Alford and O'Flynn 2012). In particular when industry-specific expertise is required and positive externalities for the public are anticipated, Rangan et al. (2006) argue that PPCs are appropriate and a suitable option. PPC account then for lower resource costs resulting from the existing expertise in the private sector. Argyres (1999) mentions the development of the, at this time, most modern aircraft, as a collaboration effort of the public and the private sector. This indicates an increase in innovation efforts. Additionally, by collaborating regularly with private entities, administrations gain benefits such as the discharge of the administration (Savas 2000). Lastly, PPCs allow a certain degree of flexibility (Alford and O'Flynn 2012). Private support can be adapted to different projects. Especially, smaller companies can adjust more easily to the given circumstances when collaborating with the public administration.

However, the benefits and success factors of PPCs cannot be generalised. Estache (2006) argues that next to the differences in assessment criteria, the sector, geographical region and participating actors are contributing to differences in the implementation of PPCs. Therefore, Mause and Krumm (2011) stress the need to individually evaluate the cost benefits of each PPC in comparison to inhouse solution.

2.2.4 Drawbacks

Despite of the benefits that are stressed in various academic papers, the complexity around these collaborations must be considered (see Leite and Ingstrup 2022). PPCs spark a lot of different opinions and there is no clear consensus on their impact (McQuaid and Scherrer 2010; Song et al. 2016). The involvement of private companies leads to changing power dynamics and might foster potential conflicts (Gasco-Hernandez et al. 2022).

Depending on the project's nature, the expected market conditions mentioned in the benefits section are not always given. Due to underbidding, a situation in which a limited number of private companies compete within procurements might occur. This leads then to restricted competition (Caldwell et al. 2005; Roehrich and Caldwell 2012; Savas 2000). According to Caldwell et al. (2005) the project is then at risk for cost saving measures. Private companies might restore margins by substituting experienced personnel with less experienced employees. Additionally, even competitive procurement processes might not be corruption free, leading to unlawful favouritism (Savas 2000).

Besides these institutional reasons, authors such as Sack (2019) portray an ineffective use of monetary resources and delayed project closures. Even unexpected monetary costs can occur as a result of high transaction, monitoring and set-up costs, which are significant drawbacks in PPCs (Liu et al. 2024). Additionally, both sectors diverge in coordination and control mechanisms. According to Leite and Ingstrup (2022), different market mechanisms are a challenge for PPC. Hence, market and non-market governance needs to be aligned. If the varying institutional backgrounds are not acknowledged by both parties, conflicts might arise.

Although PPCs are expected to support the public sector with its service delivery, their goal cannot always be accomplished. Greater complexity due to the variety of stakeholder make projects more challenging for the project's management and the project's relationship management (Leite and Ingstrup 2022; Dawes and Pardo 2002). Differences in mindset and cultural norms can increase these drawbacks (Marschollek and Beck 2012). Such factor might lead to unexpected difficulties. Thus, scholars emphasise to navigate social ties among the stakeholders as this is an essential part of PPCs. Other potential risks related and influenced by the stakeholders, are the abuse of power and knowledge by the private actor (Yildiz 2007). Private partners might influence policymaking or prioritise their own interests over public ones. Especially these factors can in turn influence the perceptions of PPCs and amplify the challenges. Therefore, it is even more important to adequately evaluate the use of PPCs for each use case separately (Eßig and Batran 2005).

2.3   PPC in eGovernment

Despite most of the literature on PPC focusing on infrastructural or financial issues (Palaco et al. 2019), there is a growing collection of studies on PPCs in ICT and eGovernment projects. According to Rorissa et al. (2010), especially countries in the Middle East and North Africa that made use of PPCs, are successful in the delivery of eGovernment services. Within these regions, PPCs serve as a "catalyst for ICT adoption" (Rorissa et al. 2010, p. 65).

Their use cases can vary; PPCs are often instrumental helpful in implementing digital services for citizens and businesses, as well as digital processes within public organisations (Sharma 2007). Especially countries, that score top places in eGovernment rankings such as Estonia, and Singapore, use PPCs to develop their ideas (Kalvet 2012; Sharma 2007). In particular, smart city initiatives, which can be linked with eGovernment efforts, note PPCs to be an essential success factor (Van Winden and Van Den Buuse 2017). Neuroni et al. (2019) as well as Walser and Haller (2016) recognise PPCs as fundamental for such initiatives. Leite and Ingstrup (2022) analyse a smart city project in

Brazil. Within this project, several well-known IT providers work together with the city to implement smart city solutions. During the implementation, different competencies were aligned. While one company was responsible for the hardware, another was at the core for the delivery of software. With the participation of various stakeholders, local aspects can be captured. To capture local aspects is a fundamental element given that citizens use the majority of outcomes in smart city efforts directly. The authors further describe such PPCs, as a "complex, nonlinear, and dynamic phenomenon" (p. 273) which exhibits that ICT related projects occur to be more multifaceted than PPCs in other areas. Furthermore, due to limited governmental resources of IT experts, the private sector contributes its expertise and facilitates digital progress (Haller 2019).

As eGovernment is seen as a broad term, its form of collaborating can differ from classical forms. Klievink et al. (2016) research on public-private information platforms, which are used by businesses to transmit data to public agencies. These platforms were co-developed which offers the benefit that potential users can include their ideas and wishes. The interests of the stakeholders can be indulged, "enabling outside-in transformation" (Klievink et al. 2016, p. 78).

While reviewing strategic eGovernment plans, Anthopoulos et al. (2007) figured that especially private sector senior consultants play an important role in project management. While the government remains the leading partner, the private sector supports with its abilities. Picazo-Vela et al. (2018) research on the effect of private collaboration within a digital government context. Their findings depict two effects: while resources are affected negatively, the creation of public value seems to be positively correlated with private sector institutions. Nevertheless, a more intense collaboration between the public and the private sector leads to more effective outcomes because of improved processes.

Ultimately, within a study by Callens et al. (2024), especially in projects focusing on digital themes, ICT expertise is predominantly supplied by private partners. This expertise is widely acknowledged as the most crucial type of expertise. A contributing factor is the experience of private companies and the already developed tools and skills which can be tailored to each specific case.

3   Contextualisation of the Research

This section elucidates on the context of this research by aiming to introduce the background around the topic at hand. First, the landscape of Germany's public administration is introduced, followed by the country's efforts in eGovernment and a chapter with particular attention given to its stance and legislation on PPC. This section is of further importance as the implementation of Germany's eGovernment strategy is shared across all levels of government, with special emphasis on lower-level governments.

3.1   German public administration landscape

As this research assesses the German context, its public administrative system is introduced in this section. Stated in its official name, the Federal Republic of Germany is a federal nation. Germany's current structure was finalised in 1990, after minor changes following its reunification in 1989 (Reutter 2020). With 13 area states and three city-states, Germany is divided into 16 federal states. Distinctive local governance structures characterise city-states due to their small size. In contrast, larger states maintain strong local governments, comprising county-free cities, cities, and municipalities.

This multi-level governance system is anchored in Article 30 of the Basic Law. Further, integral to Germany's administrative system is the vertical separation of power between the federal, the state and local level governments (Behnke and Kropp 2021). This goes back to the post-war period of the second world war, when a concentration of power was aimed for to be prevented. Except when the federal government retains exclusive or concurrent legislative competences, the state governments are primarily responsible for the legislative execution and implementation functions (Wehling 2006). Moreover, this division of power extends beyond the state level. According to the principle of subsidiarity, decision-making power and responsibilities are allocated to the lowest possible level (Wehling 2006). As a consequence, intervention from the federal government is limited to cases, in which it has exclusive competences. These are areas such as foreign policy, defence, and criminal law, which are, after all, rare exceptions. Exclusive competencies of the federal states include areas such as police organisation and educational policies. However, approximately 80% of the state's responsibilities are delegated to the local level (Grunow 2003). Germany's local level comprises around 11.186 local authorities. These authorities are split into 106 county-free cities, 294 counties and 10.786 municipalities (Statista 2024a, 2024b). These counties and municipalities not only support the state levels but also handle tasks related to public

transport, hospitals, and kindergartens (Ruge and Ritgen 2021). Overall, Germany serves as a strong example of local self-government (Kuhlmann et al. 2021).

Given their significant role within Germany's administrative and political structure, the state level continues to wield substantial influence in federal politics. On a federal level, the 16 states are represented through the Bundesrat (Sturm 2006). The members of the Bundesrat, and therefore the power relations, are distributed according to a state's inhabitants. The members can vary from two to six per state and are delegated by the government of each state (Art 51, GG). According to the German basic law, the competencies of the Bundesrat are threefold. The Bundesrat participates in legislative processes, including the enactment of new federal laws but also in issues relating to the EU. Each proposal of a new law by the federal government is send to the Bundesrat. Here, the Bundesrat can appeal certain laws besides providing a statement. Despite this, some laws need the approval of the institution. Hereby, the Bundesrat is required to react to the law proposal. Equally important is the ability to propose new legislation, which is then discussed in the Bundestag.

The federal states hold compelling decision-making power with autonomous public administrations. Hence, each state has a similar structure to the federal government, including a prime minister, a parliament, various ministries as well as its own legislation (Sommermann 2021). Operating under a parliamentary system, the states are partially sovereign states. They administer and lead their own judicative, executive, and legislative institutions. Every five years, each state hold elections in which the citizens vote for parties that will form the parliament. Considering the multiparty system in Germany, not only the federal level but also the state governments are usually governed by coalitions of 2-3 parties. At the local level, mayors and councils play a key role, with the citizens being able to directly elect the mayor (Kuhlmann et al. 2021).

Concerning the German public administration, the system in which public servants work in differs tremendously from the private sector. Public employment counts for more than 5 million employees, with most of them working at the state and municipal level (Reichard and Schröter 2021). A third of these, over 1.7 million, are employed in a special civil servant system (de statis 2023). A significant portion of these civil servants serve in roles related to the police, the judiciary, education, and administration and governments (de statis 2023). This system is supposed to guarantee the objectivity and impartiality of civil servants when fulfilling their public functions (Sommermann 2021). Moreover, attributes such as lifetime employment and a merit-based career path belong to the elements of the profession of civil servants (Sommermann 2021). Thus, the career path within the public administration is typically connected to the loyalty of an employee

towards the employer. The more senior an employee is within the system, the higher are the chances for promotions and, coming along with this, higher remuneration (Reichard and Schröter 2021).

3.2   eGovernment in Germany

Despite of its economic success, Germany is lacking behind in eGovernment applications. Its first eGovernment efforts started in the early 2000s with the Initiative BundOnline 2005, aiming to make government services available online (Hill 2002). Although the numbers speak for the initiative, it has not been a full success due to the ignorance of more complex online services and the missing standardisation of processes (Thome 2006).

To keep up with the pace of digitalisation, the German government released the eGovernment law in 2013. Within this, it is mandatory for all levels of government to guarantee online access to services to citizens (BMI 2024a). Currently in discussion is the German Online Access Act (OAA; dt.: Onlinezugangsgesetz). First adopted in 2017, the large-scale project involving 575 public services and appeared to be a significant advancement at the time of its adoption (Braun 2021; Mergel 2019). According to Mergel (2019), no other country has ever planned on implementing a reform on this scale and scope. The OAA aimed to accelerate the digital transformation of the public sector (Mergel 2019). For this, most public services are supposed to be provided by the state and local level governments and then made available through a common platform. This plan, however, was only partially successful. It led to services being established more than once as state and local governments did not reuse already existing services (Mergel 2019).

In its initial form, the OAA indicated that all of the 575 public services were expected to be digitalised by the end of 2022 (BMI 2024a). In early 2024, most of the services were still not available online nationwide (BMI 2024b). Additionally, there is a huge divergence across regions, for instance, Bavaria is leading in the provision of online services while other German states such as Brandenburg are lacking behind tremendously (BMI 2024b).

Notwithstanding its foremost aims, its implementation and overall approaches are often criticised in literature. The set principles within the OAA were not fully fulfilled. Therefore, the digitalisation of the public administration remains incomplete (Wimmer 2021). This is due to various factors, complicating the efforts. Reverting to the fact that Germany is a decentralised country, another challenge that Germany's eGovernment initiatives arise: Germany's federal structure hinders the efficient implementation of online services as all levels of government are responsible for the implementation of such

(Gauß 2020; Halsbenning 2021; Scholta et al. 2019b). Gauß (2020) even describes this diversification of responsibilities as a "patchwork approach". While the federal and state governments are supposed to cooperate in setting the necessary foundation, such as standards and security measures, the responsibilities of the mainly implementing local level remains unclear and in hands of the corresponding states (Mergel 2021).

The coordination of various governmental levels might become equally problematic from a legal point of view. Especially, this is the case if an actor decides on an issue which goes beyond their competencies. This hinders public actors to cooperate. However, concerning the subject of IT, collaboration between the various governmental levels is legal (Voss 2021). Additional differences in the progress of eGovernment applications complicate the initiative (BMI 2024). While the OAA attempts to encourage collaboration across the stakeholders, multiple experts consider the chosen system as too complex (Richter 2022). Not only were most of the services not implemented according to their originally set deadline in 2022, but the public sector itself is also showing difficulties in adapting to the cultural shift digitalisation requires (Rackwitz et al. 2021). An example that was highly discussed in the media was the financial aid scheme for students. Although students can apply for it online, public administrations still need to print out the online forms in order to process the request (Wiebe 2022). Halsbenning (2021) and Rackwitz et al. (2021) argue that employees in public administrations lack the necessary skills to undergo the digitalisation of the administration. The knowledge being not within the public sector, leads to insufficient capacities to meet the goals of the government. Despite the eGovernment initiative being a law in itself, it collides with other laws, resulting in legal constraints during the digitalisation process. According to Mergel (2021), handwritten signatures and personal appearance are as required as paper forms usually. This naturally hinders the digitalisation options, leading to blocked efforts as they are not legally compliant.

After realising the non-achievability of the OAA's objectives, the deadline was prolonged and certain services were prioritised (IT-Planungsrat 2022). After years of not meeting the deadline and various other difficulties, the OAA 2.0 was brought into the setting. Contrary to the OAA, the OAA 2.0 focuses on end-to-end digitalisation with an aim to increase the standardisation of infrastructure and processes. One of its main aspects is to merge the citizens user accounts from the state level to the national level. The accounts are named BundID. Some of the aforementioned problems are targeted as well; with the end-to-end digitalisation, online applications such as the financial aid for students, are targeted to be digital throughout the whole process (BMI 2024c). Yet, specific roadmaps of how standardised solutions will be possible in the future are not within the content of the proposal (von Maltzan and Zarges 2024). However, it was not passed through the

Bundesrat in the first round in early 2024. Hereby, Germany's federalist structure played an integral part. According to the representative of the regional level, the OAA 2.0 enables too many competencies to the federal level. It does neither include the inclusion of the state or local level nor representatives coming from these levels of government (Deutscher Landkreistag 2024). At the submission date of this thesis, no consensus regarding the OAA 2.0 was found. Further discussion on the law is set to be continued.

3.3   PPC in Germany

In recent years, traditional sectors, such as construction and infrastructure, have shifted to create room for new opportunities. The application areas of PPCs seems to be getting broader over the years. In particular, the areas of digital infrastructure and smart cities are targeted to develop at a faster pace (Bundesregierung 2014, 2023; Kwak et al. 2009). This is especially a challenge for local public administrations as Germany's decentralised system shifts the responsibilities to offer public value to local governments, as seen in section 3.1. The lack of resources is even more evident, as local governments often do not have a suitable network and competencies to develop technical solutions (Van Winden and Van Den Buuse 2017).

Germany's economic landscape relies significantly on the involvement of private companies in delivering public sector services. Public procurement plays a crucial role, accounting for 13-15% of the German Gross Domestic Product (GDP) (KOINNO BMWK 2024; OECD 2019). When compared to other OECD countries, Germany ranks seventh in descending order in terms of public procurement volume. Other statistics, such as numbers from the procurement agency illustrate procured services of more than 12,3 billion euros in 2023. 91% of this is due to IT services and products (BeschA 2024). A study by the German Ministry for Economy and Climate Protection displays the use of private companies within the digitalisation of the public administration (Dieke et al. 2022): Even though 73% of the municipalities use public IT service providers, more than half of the municipalities also operate with private sector providers. The majority of private providers are locally located; opposing international companies which are solely employed in 3% of the municipalities. Despite the frequent use of the concept, 49% of local authorities encounter challenges in locating appropriate IT providers and support. Taking one of the narrow definitions of PPP into consideration, the EPEC measures the use of such partnerships within EU countries. In their statistics, Germany is among the top-ranking positions by value and number of PPPs within the EU (EPEC 2023).

Most types of PPCs in Germany operate under public procurement law. Within this, the process of procurement procedures is specified by various entities: the state and the federal level as well as the EU. The responsibilities of each player depend on the value of

the potential product or service, the matter itself and sometimes even on regulations that allow for exceptions (KOINNO BMWK 2024). While for smaller projects no procurements are needed, the level of the compiling law increases with the value of the matter at hand. Especially high procurements need to be put out for procurement across the EU. The primary objective is to ensure an economically efficient use of budget funds. This is achieved through fair competition as private companies bid on the tendered projects. Various other factors can influence the procurement decisions. Procurement decisions consider not only economic efficiency but also environmental and social responsibility, as well as innovation capacity (BMWK 2024).

While working with IT providers, the public sector demands a variety of services, with a focus on advisory services and specialist processes (WIK 2022). In response to the growing importance of PPCs, Germany established a task force, *Partnerschaften Deutschland*, that aimed to increase the use of especially PPPs from five to fifteen per cent in 2008 (Röber 2018). However, due to longstanding criticism, their focus shifted to in-house consulting services for and by the public sector in 2016 (PD 2023; Röber 2018). Since the early 2000's public IT providers strengthen their role in the market, leading to an additional competitor for private IT providers in the public market. A major aspect public IT providers benefit from is their exception from the procurement law (Hillebrand and Stuck 2022).

Although the majority of PPCs have a legal basis and undergo numerous processes, their challenges and criticism ought not to be disregarded. Notable scandals include the federal government's excessive spending on external consultants in 2018/2019 - also known as „*Berateraffäre*". This practice was majorly criticised by the Taxpayers Association and the Federal Court of Auditors. Both understand the use of external personnel, however, questioned the excessive usage (Berliner Morgenpost 2019). Other contentious issues in German ICT PPCs entail delays in the projects and cost overruns (Kostka and Anzinger 2016; Walser and Haller 2016). However, a common obstacle for research specifically are the poor documentation standards of PPCs and public procurement as most documentation is based on a voluntary basis (OECD 2019; Wigger and Zimmermann 2020). There is no common data repository for all PPC activities. As a result, obtaining reliable and accurate data is barely possible. Since the end of 2020, the German Ministry of Economics and Climate Protection has released statistics on public procurements. In this context, IT services, which include consulting, software development and other related services, account for one of the ten most used fields in public procurement (BMWK 2023).

4 Methodology

Within this section, the research design and its implementation are presented. After giving an overview, the data collection is presented in more detail, followed by an in-depth explanation of the data analysis.

4.1 Research design

This thesis follows an explorative, inductive study design using qualitative data. Often inductive and explorative research designs occur in conjunction (van Thiel 2022). An inductive study design supports in identifying main elements and theories of research topics that have little pre-existing literature. According to van Thiel (2022), the problem needs to be identified and then observed. This allows for the formulation of axioms and corresponding theories. Often, inductive research yields for the establishment of a theoretical framework. As this is not the purpose of this research, this remains out scope. The decision against using a theoretical framework arises mainly from the lack of literature combining both – PPC and eGovernment. Despite the existing studies on both PPC and eGovernment separately, the majority of the developed frameworks are not suitable for a study that does include both concepts. Moreover, existing studies within the combination of both fields are not focusing on the German or related contexts. Therefore, the few existing frameworks can neither be supported nor denied, lacking in important validity. Although the obsolescence of a theoretical framework comes with disadvantages such as the risk of reduced validity and less guidance throughout the research (van Thiel 2022), exploratory research leaves room to discover new perspectives to an already existing topic (Swedberg 2020). Therefore, the objective was to structure the research questions and the methodology as far as possible.

To address the two research questions, strategies common in studies adopting a grounded-theory approach are employed (Glaser and Strauss 1967). The qualitative data stems from semi-structured expert interviews, which are coded after the data collection (see section 4.3). The expert-definition is closely linked to the interviewee's occupational group. Thus, the interviewees are operating as "functional representatives" (Misoch 2015, p. 121). To achieve a holistic understanding of the subject matter, both, private and public sector experts undergo interviews. Semi-structured interviews are chosen due to a number of reasons. While interviews are self-reported and therefore remain biased, quantitative data cannot explain all the motives that lie behind the research questions (Zittoun 2021). Therefore, quantitative data allows to familiarise with the perspectives of individuals who have practical experiences in the field. Furthermore, given the under-researched nature of the matter at stake, interviews are vital for this research effort. Openly available data on

PPCs in Germany is insufficient, necessitating the use of qualitative data. Thus, semi-structured interviews enable to form profound insights into emerging factors and provide opportunities for further investigations (Zittoun 2021). Additionally, semi-structured interviews deliver the needed flexibility needed for explorative research (Makri and Neely 2021). Yet, it is integral to keep in mind that semi-structured interviews tend to present a subjective narrative as an expert's perspective is being used as 'factual data'. Therefore, the data needs to be contextualised during the interviews as well as the data analysis period.

4.2 Data collection

Due to the lack of sufficient information on the subject, conducting interviews is crucial for this research endeavour. Interviews allow to become acquainted with the perspectives of individuals who have practical experiences in the field. The data collection consists of the interview candidate selection and the final sample with the preparation and conduction of the interviews. Qualitative data was gathered through semi-structured interviews undertaken between the 23.02.2024 and 29.05.2024.

4.2.1 Interviewee selection and sample

An overview is given in Figure 3. The figure provides an overview of the two applied research designs. The upper part of the figure describes the first approach which had to be abandoned due to a lack of potential case studies. The lower section refers to the actually applied research design. The figure is separated into three areas of this research's data collection: an initial stage is to identify prospective interviewees, followed by a contacting stage in which potential interviewees are contacted through various means. Ultimately, the interview data is collected.

Figure 3 Research design

| Identifying potential interviewees | Contacting potential interviewees | Collecting interview data |

Research Design 1

Desk research
- Google, i.e. project websites, city webpages, newspages
- LinkedIn

Form of contact
- Email
- Phone calls

N =49

Case study
- Multiple interviews with project team

Abandoned due to lack of replies and suitable cases

Research Design 2

Desk research
- Bitkom Smart City Index
- Google, i.e. city and company webpages,
- LinkedIn

N =2

Private sector
→ Public sector managers
- LinkedIn Message
- Email

N =19

Public sector
→ Digital responsible
- Email
- Phone Calls
- LinkedIn

N =30

Semi-structured interviews
- Interviews with public and private sector employees

N =8

N =7

N =15[1]

1 : N=17 were conducted with N=9 from the private and N=8 from the public sector, however, one interviewee per sector was left out in the data analysis due research design adjustments

Initially, the interviewee search was conducted via a project-based approach (Research Design 1). For this, online desk research was used to find potential public-private partnerships[2]. By doing this, involved parties and individuals of such partnerships would have been able to be identified (Magnusson and Marecek 2015). However, this approach was stopped due to the lack of replies and suitable cases. N=49 were contacted, however, the individuals that replied were non-familiarity with the topic. Four interviews arose from this phase[3], whereas two interviews were not further processed due to (a) the non-fit of legal entity and (b) the focus on PPCs in eGovernment on the federal level. The method was then changed to an individual-based approach, targeting individuals who meet the specified requirements mentioned below.

The second research design started similar to the first one. During the online research, Google as well as LinkedIn were mostly used to locate potential interviewees. To filter for potential cities, the "Bitkom Digitalranking" of larger cities was used (Bitkom 2023). Within this, German cities with more than 100.000 inhabitants are ranked according to their eGovernment advancement. Although this ranking is not peer-reviewed, it allows to gain a first impression of the cities. Moreover, a filter relating to the number of inhabitants of each city was applied later. The single cities were then googled in combination with the terms "*eGovernment*" OR "*digitalisierung*" (engl.: digitalisation). If suitable contact details were found, the responsible unit or person was contacted. Due to the limited replies of major cities, the research was limited to cities with a range of inhabitants from 100.000 until 480.000. This range depicts the smaller large cities (*Kleinere Großstädte*) in Germany (BBSR 2023). This selection was made since these cities represent the majority of Germany's larger cities and possess the necessary competencies and responsibilities to advance digitalisation according to the principle of subsidiarity as presented in section 3.1.

To identify suitable private sector interviewees in Research Design 2, desk research was used again. Potential interviewees were contacted mainly through LinkedIn. Additionally, Google search was used to find suitable private entities, which appeared to work with a local government on eGovernment projects. This was mainly based on the references on their webpages. Potential interviewee fits were then contacted via email. In total, N=49 were contacted during the second research design phase, of which N=30 were cities or employees at city offices and N=19 private companies or employees of such. N=18 were

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[2] During the first research design the term PPP was used.
[3] Three of the conducted interviews followed the initial version of the interview guide. See more below in section 4.2.2.

open to conduct interviews, however, not all moved to the interview stage due to time constraints or no further replies.

During the identification process, potential interviewees were filtered and selected. For this, three main criteria were used in the selection process:

(1) Potential interview candidates are required to be employed or work within the public or the private sector. For public sector employees, their working unit should concern the fields of eGovernment or digitalisation of the administration. Individuals working within the private sector should collaborate with the public sector, preferably on a local level. Alternatively, employees who interact with both sectors in order to establish or enhance PPCs such as associations, are likewise suitable interviewees. These interviews were however considered with more caution.

(2) In order to be able to reply to the interview questions, interviewees should be engaged in the topic of PPCs. Hence, they should have gained experience and knowledge about such collaborations. Nevertheless, employees of entities and administrations that opted out of PPCs are also potential candidates as their perspective can improve the analysis of current obstacles. Despite the openness, there were no such candidates that were willing to participate in an interview.

(3) The third criteria concerns the position within an entity. Potential candidates should have decision-making or managerial competencies in order to be aware of the factors that impact PPCs. For this, being informed about the processes that PPCs go through is a fundamental factor. Along with that, additional experience in the field and knowledge about current discussions within the field can enhance the completeness of the data.

The fulfilment of these criteria was tested through internet research of the individual themselves and their LinkedIn profiles. Of interest were especially current and past professional positions and posts, which were made by the potential interview candidates or in which the person is related to. The object was to establish a balance between the stakeholders by aiming for an equal ratio of public and private sector interviewees. Table 1 summarises the interviewees and provides more information. Gaining insights from multiple perspectives contributes to the formation of an understanding of the perceptions, drivers, and barriers of PPCs in eGovernment initiatives in Germany.

Table 1 Interviewee sample

No	Ref.	Duration	Role	Details on entity	Additional information
Private sector					
1	I_{pr1}	43 min	Public sector division	[XXX]	
2	I_{pr2}	45 min	Leadership role	Major consulting company	
3	I_{pr3}	49 min	Leadership role	IT provider	
4	I_{pr4}	43 min	Leadership role	SME IT and consulting service	perceived with caution as focus on state level projects
5	I_{pr5}	35 min	Leadership role	SME IT and consulting service	
6	I_{pr6}	41 min	Public sector lead	IT and consulting service	
7	I_{pr7}	38 min	Public sector lead	IT and consulting service	
8	I_{pr8}	40 min	Leadership role	Major IT provider and consulting service	
Public sector					Number of inhabitants
9	I_{pu1}	38 min	[XXX]	City 1	[XXX]
10	I_{pu2}	36 min	[XXX]	City 2	[XXX]
11	I_{pu3}	62 min	[XXX]	City 3	[XXX]
12	I_{pu4}	60 min	[XXX]	City 4	[XXX]
13	I_{pu5}	35 min	[XXX]	City 5	[XXX]
14	I_{pu6}	56 min	[XXX]	City 6	[XXX]
15	I_{pu7}	56 min	[XXX]	City 6	[XXX]
Excluded interviews					
16		38 min	[XXX]	Public IT service provider and consulting company	excluded due to changes in research design
17		54 min	Leadership position	Major German software provider	excluded due to irrelevant focus (federal level)

The empirical basis of this research consists of 14 interviews, from which N=7 are conducted with public sector employees and N=8 with private sector employees. The interviews last from 35 to 62 minutes of net interview time. The sample size of N=15 is sufficient for qualitative data analysis. Guest et al. (2006) found the effect of theoretical saturation, meaning no new findings appear during the interviews (Glaser 1967, p. 61), at twelve interviews. The basic findings are revealed after six (Guest et al. 2006). Therefore, the number of interviewees is appropriate to filter the perceptions, drivers, and barriers of PPCs in eGovernment projects. Further, Glaser (1967, p. 62) suggests that saturation cannot happen by gathering data from one affected group. Including similar groups can enhance the research's findings. Accordingly, the main participants of PPCs in eGovernment projects are interviewed. Four of the public sector interviewees are in [XXX]. The remaining three are working in [XXX], with one of them focusing on [XXX]. Although [XXX] departments are not the target of this research, this interviewee [XXX], is interviewed together with [XXX] as they are representing the same city. Both departments work closely together [XXX]. Seven out of the eight interview partners from the private sector are in leadership positions. However, the companies differed in size and focus. While all work in projects that are supposed to enhance eGovernment, the focus areas ranged from consulting to the provision of software and IT. In terms of size, the spectrum includes major companies in their segment up to Small and Medium Enterprises (SME). [XXX] is employed by [XXX].

Please note that the term PPC was introduced at a later stage of the research. At first, the term PPP was used. Although PPPs can be defined like PPCs, this strategy has shown to create an unclear understanding in the context of Germany. Most of the replies were referring to the closed definition of PPPs, with the feedback that such partnerships are currently not used in the context of eGovernment in Germany. As a result, only a limited number of personas were open to conduct an interview, with these ones referring to the broader definition of PPPs. Subsequently, the term Public-Private-Partnership was interchanged with the broader term of Public-Private-Collaboration. Please refer to section 1 for more information on the rationale behind using the term PPC. Yet, this occurred at an early stage of this research, making it viable to proceed. The initial two interviews were carried out using the PPP terminology, still the interviewees understanding aligned with that of PPCs.

4.2.2   Preparation and conduction

Prior to conducting the interviews with the selected candidates, an interview guide was prepared in order to structure the interviews. Although the interviews were semi-structured, an interview guide ensures that all relevant topics are covered. It supports the

topics which should be focused on and secures a better comparison among the interviews (Misoch 2015).

During the establishment of the interview guide, the three principles, openness, processuality and communication, of establishing interview guides by Reinders (2016) were followed. Especially the principle of openness plays an important role in explorative research approaches. Hereby, the interview guide stays flexible during the interview and can be adapted during the whole research cycle. The second principle, processuality, addresses the problem of subjectivity in interviews. To minimise the bias approaching from each interviewee's own perspective, two principles arise in Reinders (2016) approach. First, trying to achieve a perspective, where the present can be compared to the past in order to broadening the perspective. The rethinking might lead to current reflexions on the present. Second, especially for interviewees who are involved in PPC, it is helpful to ask if their answers are only valid for their projects or if they are universally valid in their opinion. The last principle covers the role communication has in interviews. The questions need to be easily and quickly understandable and as close to the interviewee's natural use of language as possible.

The interview guide was designed for approximately 45 minutes of questions and answers in order to fit into a one-hour video call. Yet, N=2 exceeded the timeframe of 60 minutes, while N=5 it took less than 40 minutes to reply to the questions.

The used interview guide can be looked up in Annex A Interview guide. The guide itself consists of six overarching topics. Hereby, the structure suggested by Reinders (2016) is applied. The first block consists of a "warm-up phase" ((1) introduction) (Reinders 2016, p.156). Hereby, the interviewee is asked about themselves, their working habitat, and their definition of PPC. In order to respond accordingly to the replies given in the other blocks, there is also a question on the experience with PPCs of the interviewee themselves. The main section of the interview, where the interview delves deeper into the context, starts in block (2). Here, the interviewee is asked on the perception of PPCs in eGovernance projects. The introduction to this block is on the role of private companies in eGovernment projects. This gives the interviewee a chance to think about their position and the role PPCs play in their day-to-day business. The third block allows a transition from own perspectives into a project perspective. (3) covers the use of PPCs. The questions conceal the forms of PPCs that are in use as well as the question "Have you observed a trend towards a change in collaboration between public and private actors?". This question allows the interviewee to take a deeper dive into the topic. Closing with block (3), block (4) is opened. This block aims to figure out the drivers of PPCs. The questions within this block are relatively direct, going from the factors that have

influenced the formation of PPCs to factors that are important to ensure the success of PPCs. While thinking about the drivers, interviewees were often already elaborating on the barriers, which allowed a seamless transition into the (5) the area of interest. Next to the barriers during the formation phase and application phase, questions concerning the most difficult phase of collaboration and prospective strategies to overcome the named barriers are asked about. In the last block (6), the deep phase of the interview ended and transferred into the end phase. Here, the interviewees are asked about their view regarding the usage of PPC in the future and if they would support it. The last question "Are there any other aspects or comments that we should discuss?" leaves room for the interviewee to add important information on the topic and rethink their given answers.

Especially the second and sixth block target to answer the first RQ concerning the perceptions of PPCs in eGovernment initiatives. The fifth and sixth were targeting RQ2, with a focus on the drivers and barriers. Lastly, block three, connects both questions and dives deeper into an interviewee's understanding of PPCs and their experiences, gaining interview results for both RQ in a rather indirect way. Although the interview guide remained stable throughout the time, it was modified after the first interview with the previously mentioned substitution of PPC instead of PPP.

While the conduction of the interviews was completely digitally via the video conferencing software Zoom and Microsoft Teams, the scheduling was conducted via email as well as via phone. The majority of interview candidates agreed immediately to an interview. With N=3, a phone call was arranged before to make sure they were suitable interviewees. In these phone calls, the research and its goals were elaborated once again.

The interview set-up followed the same steps. While the interviews started with an introduction of the interviewee and the interviewer, the research's goals were reintroduced. After, the interviewees were informed about the audio and video recording. All of them agreed to be recorded for the research's purpose. Afterwards, the recording began with the automatic transcription, followed by the first interview question being asked. The interviews were held in German due to two main reasons. First, the native language of all participants is German. Second, presumably, it was easier for the interviewees to talk about their work in their working language. Due to the focus of this study, the data collection in the original language made sure there was no miscommunication.

4.3   Data analysis

The interviews were recorded and automatically transcribed by the two aforementioned software tools. Eventually, the automatic transcription displayed flaws. Among the

misinterpretation of single words, occasionally, the transcription software mistakenly omitted entire sentences. Subsequently, all interview transcripts were reviewed again and occasionally cross-checked with the audio files. Despite being time-consuming, this phase is essential for the later interview analysis as it guaranteed the accuracy of the data being processed. After establishing a complete transcript, the document including the transcription was uploaded into MAXQDA. Hereby, the version supplied by the University of Münster was used.

To analyse the interviews the coding theory suggested by Charmaz (2014) was used. After the data collection, two coding phases are applied to the interview transcripts in order to understand and further analyse the content of the conducted interviews. First, the transcripts were initially coded. The initial coding ensures that the data is well understood, and no significant information remains unseen. This step helps to explore the data and acquire an overview of the made statements, distanced from initial personal influences (Thornberg and Charmaz 2014). This first phase is based on inductive coding. This allows to interpret the data without the influence from existing theories and concepts. Although both areas, PPCs and eGovernment, are well researched areas, the combination shows rather limited available data. Due to this, inductive coding is suitable (Chandra and Shang 2019).

Second, a focused coding phase was applied. This allows to form a more developed understanding of the data by focusing on certain codes. To ensure only relevant data is used, the most important codes from the initial coding phase are utilised and further analysed. Most important codes are defined as "most significant and/or frequent earlier codes" p.139 (Charmaz 2014, p.139). These are largely codes, which were mentioned frequently or were elaborated on in a rich way by the interviewees themselves. By doing so, it is possible to direct the focus on the main areas, while analysing the transcripts further. This second analysis ensures a sharper view of the gathered data while keeping in the background the initial analysis (Charmaz 2014). This allows an in-depth understanding of the data.

5   Results

In this section, the findings of the two research questions are presented. Thus, this section includes three primary themes: the perceptions on PPC, which pertain to RQ 1, and the drivers and barriers of PPC, which aim to answer RQ 2. Table 2 presents a summary of the drivers and barriers.

5.1   Perceptions of PPC

This section addresses the perceptions of PPCs, including the interviewees views on the terminology as well as positive and negative perceptions. It should be noted that respondents' perceptions are shaped by their personal experiences along with external factors. Although the terminology used for PPC is generally seen in the same light, there are variations in the interpretation of what PPC encompasses. All interviewees emphasise the significance of PPC for eGovernment projects in Germany. Yet, the majority of interviewees also express negative perceptions, mostly concerning the potential risks associated with adopting PPCs. Furthermore, the future prospect is predominantly optimistic, with single exceptions.

5.1.1   Perception of PPC concept

Although the term PPC is unfamiliar to most of the interviewees, their description of the term is similar. PPCs are commonly characterised as collaborations between the public and private sector.

> *"I understand [...] the agreement between a mostly public actor, such as a municipality, state level, federal level, with a usually private-sector actor, who join forces to provide a service that was previously provided purely by the state."*
> – [XXX]

The collaboration can appear in various ways with different levels of engagement of both partners. Most interviewees consider collaboration to be a fundamental component of PPCs. The tasks are delivered collectively, as both actors bring in ideas. For [XXX], a win-win-situation for all stakeholders needs to be given. [XXX] defines PPCs as an innovation partnership aimed at providing services that are currently not existent. Contrary to the public sector interviewees, [XXX], [XXX] and [XXX] observe that PPCs relate often to taking over tasks of the public sector and act as supplementary personnel rather than engaging in collaborative problem-solving, especially in the realm of eGovernment. [XXX] refers to this practice as "body-leasing".

PPCs can have various stakeholder and can vary in their organisation. One-on-one projects are mentioned as well as consortiums [XXX]. In addition, there are various types of collaboration efforts introduced, such as cooperation efforts of multiple smaller cities and public bodies [XXX], wherein private partners are incorporated in a joint effort to provide a solution.

Relating back to the perceptions of PPCs, their use cases vary. Widely implemented are service provider contracts. Such service provider contracts are frequently connected to the provision of IT infrastructure, the development of digital services with its applications, as well as consulting services (i.e. project management, implementation of new software or technology, restructuring or the development of new tools). In many cases, collaborations occur with private sector companies which are specialised in specific governmental processes. Other tasks are the implementation of innovative solutions such as AI and knowledge management as well as machine learning and process automation.

PPCs can either start through assignments by the public sector to a private sector company or through public procurement activities. Nonetheless, public procurement is perceived as the more frequent option [XXX]. An alternative yet increasing option mentioned are received grants (dt: Fördermittel) and negotiation procedures, in which private companies need to present their ideas to a certain problem of the public administration [XXX]. Within grant project, the role of private companies is smaller than in other forms of PPCs. Nevertheless, they are included in the development of eGovernment services and products [XXX]. This form is often threefold among the local authority, a university and a private company. Therefore, they are not further elaborated here as this is out of this research's scope. Another frequently mentioned private partner are public inhouse IT providers. However, because they legally belong, at least partly, to public bodies which is accompanied by certain characteristics, these are again beyond the subject of discussion.

Multiple interviewees refer to PPP in this context [XXX]. Though some interviewees do not see a distinction [XXX]. However, [XXX] indicates that PPP has a very narrow scope and is commonly seen as a tool for infrastructural issues. [XXX] believes PPPs rather to be a solution for bigger private actors and public institutions. One PPP related to eGovernment is introduced by [XXX], which is however dissolved. Sometimes, the term outsourcing is mentioned in this context. However, this form is not seen often in eGovernment projects [XXX].

5.1.2 Positive perception

Without exception, all interviewees consider PPCs to be a key element of eGovernment projects in Germany. Private partners are regularly seen as essential partners in eGovernment projects undertaken by the public government. [XXX] underlines the key role as "there is no alternative. […] the alternative is that we simply fall further behind." [XXX] also supports this notion, since the interviewee argues that municipal administrations must acknowledge their inability to independently manage the digitalisation of public administration. The strong reliance on private partners by public bodies to achieve their eGovernment objectives is constantly mentioned. PPCs are herewith vital for the advancement of eGovernment applications in Germany. However, [XXX] sees mutual dependencies. The perceived drivers for the use of PPCs are elaborated in section 5.2. [XXX] expresses a firm stance that "the administration is, for a big part, not able to organise their IT-systems on their own". The interviewee further mentioned:

> *"Without consulting companies, in other words IT consulting, the administration would collapse from one day to the next. Quite simply. You have to say that. It would collapse."* – [XXX]

Not only is the role of PPCs seen as essential, but all interviewees also perceive the involvement of private parties to function mainly positively. All interviewees agree that most projects are running as they are supposed to. Next to facilitation workshops, are collaborations with software providers positively seen as well as long-term collaborations [XXX]. Especially workshops in which the public sector can learn certain skills, such as project management or low code, are gaining in importance [XXX]. Moreover, the collaboration in grant projects is perceived as successful. Various interviewees see operating models such as software-as-a-service (SaaS) solutions as in particular success in IT spheres. An observed trend is hereby the development towards cloud infrastructure and services [XXX].

Positive changes occurred over the years. In general, both sectors can see an increased openness and will to engage with private partners in eGovernment projects [XXX]. The way of working enhanced over the years, with a focus on being more at ease with the stakeholders [XXX]. The public sector got used to using PPCs and private companies are getting more accepted. Nowadays, more openness concerning new technologies is observed. For instance, AI is much faster a topic for public administrations compared to cloud solutions a decade ago [XXX]. Additionally, public administrations show more openness towards alternative payment models such as monthly rates and alternative procurement options [XXX].

Hence, the use of PPCs grew in the past years [XXX], with an increasing number of private companies joining the market and growing business segments [XXX]. Businesses have increasing awareness for the characteristics of the public sector and specialise as such. [XXX] and [XXX] see an increase in offers from the private sector. With this, the scepticism within politics and society arises. However, [XXX] cannot understand these negative perceptions and the "consultant bashing". If a balance is given, private companies do support the public sector [XXX].

5.1.3   Negative perception

Despite the recognised importance of PPCs, there are negative perceptions and scepticism concerning the collaborations. Various factors, presented in the Barriers section 5.3, lead to projects being less or not successful at all [XXX]. [XXX] sees especially problems if several private partners collaborate within one project. [XXX] questions whether PPCs always make sense or if they just run because a certain network is established.

Integral factors influence the negative perception of PPCs. Some interviewees mention that their work includes tasks that the public sector could do on its own. Often criticised is also the use of PPCs in order to outsource tasks by using the private sector employees as substitutes for civil servants [XXX]. Others, often see that private organisations account for more personnel in the public administration, but once they finished their project, the work force leaves, remaining no passed on knowledge to the public sector [XXX]. Such substitutions for civil servants are causing a vicious cycle, where the public sector is not taking any learnings out of the collaboration, leading to project after project being carried out. This happens extensively at the end of projects when the implementation phase is neglected. However, vicious cycles can also be internally created by public organisations if internal personnel is changing their position within the organisation [XXX].

An often-perceived fear is the dependency on private IT provider, creating a vendor lock in. Once decided on a certain software from a private partner, it might be hard to switch to another one, especially if systems are already integrated [XXX]. This is also seen by various private sector providers as a risk, leading to dependencies on the private sector [XXX]. In this context, digital sovereignty is mentioned by [XXX], which leads to the fear that the public sector cannot safeguard it anymore. An amplifying factor for this is the current favouritism for cloud services [XXX]. This leads to higher dependency by the cloud infrastructure of the private company. To avoid this, some cities are increasingly focussing on open-source solutions [XXX]. Herewith, the public sector can switch private partners as they are not bound to a company software solution. However, even here, the problem persists that only certain companies provide and maintain these softwares [XXX].

The dependency is occasionally accompanied by taking advantage of a monopoly position by the private partner. [XXX] and [XXX] mention that in this case, collaboration is rather difficult due to the positioning of the private company:

> *"But I'm particularly aware of the fact that you then become a supplicant and the quality deteriorates, the service deteriorates, and the waiting times get longer. And, of course, that has an eternal tail, because that's exactly what we don't want, but because of tendering issues and the lack of providers in certain areas, there's simply no pressure for the company to do that."* – [XXX]

This is especially true for some products on the market, where single players are concentrated [XXX]. Other forms of dependency are the reliance on private partners to control whole projects [XXX]. If this happens, private companies are managing other private companies, being able to influence the project and political decisions.

Especially PPPs suffer from a negative perception due to past failure with high media attention, leading to caution and reluctance in adopting further collaboration [XXX]. [XXX] argues that PPPs are not being used "Because, all in all, they have not proved their worth.". Additionally, one interviewee contradicts in terms of consulting services. He describes the use of them as a "fig leaf" [XXX], being used when public authorities do not want to take responsibilities. Contrary to this, [XXX] does not understand the fear of the public sector towards PPPs. In her opinion, PPPs are an established instrument in various countries and could benefit Germany's eGovernment efforts.

5.1.4 Future of PPCs

The future of PPCs is mainly perceived as positive. All private sector employees see an increase in the need for PPCs, with the key reasons being the current drivers, as they will persist in the future. Therefore, the need to make use of PPCs is still there:

> *"The role will still be needed. There is no way around it."* – [XXX]

> *"Yes, I think it's essential that we manage to maintain this at all."* – [XXX]

While all interviewees agreed to the point that the public sector needs external support, the perceptions differed, asking for the future importance of PPCs per se. Some exceptions are seen in the extent to which PPCs will be used. Especially, the public sector is split in their views about the role of PPCs in the future. While [XXX] and [XXX] are rather critical, [XXX] see the use of PPCs as essential. The former two interviewees predict a decrease in the use of PPCs. However, both see different reasons for this. [XXX] mentions ongoing crisis situations, in which the public sector needs to stay reliable

concerning its critical infrastructure. For the interviewee, the public sector is expected to build up capacity and inhouse solutions in the long-term. However, [XXX] sees a market clearance, with less available companies and the increase of regulations as an integral driver for less PPCs in the future. Still both interviewees think that PPCs still take a central role for eGovernment projects. A certain level of collaboration and reliance on private partners will persist. Contrary, [XXX] sees the use of PPCs as a matter of course, especially when providing infrastructure, applications, and similar products. [XXX] and [XXX] note that through the ongoing digitalisation, public administration will become more complex. This encompasses, for example, a greater number of communication channels that need to be served.

Nevertheless, some interviewees are seeing an increasing importance of building up expertise in the public sector and enhancing inhouse services, at least to some extent [XXX]. Especially inhouse consulting services become more important throughout the time [XXX]. These can operate separately from the competitive procurement market which means that cities do not need to go through procurement processes [XXX]. By doing so, the state is on its way to gather their knowledge within the public sector. However, considerations need to be done concerning the competition aspect as it drives the companies to provide the best offers. Therefore, public providers need to be competitive as well [XXX]. Additionally, [XXX] doubts that these will have access to as much resources as the private sector. In addition, monetary resources influence the use of PPCs in the future. This aspect is however solely mentioned by a few interviewees. [XXX] is convinced that money will always be available for PPCs in eGovernment. [XXX] sees however the barrier, that the monetary resources for digitalisation efforts need to exist in the long-term. Here, the public and private sector opinions are diverging.

Concluding the future perceptions, all interviewees agree that, at least in the short-term, there is no way around PPCs. Thus, in the context of eGovernment, PPCs will continue to be a necessary tool.

5.2   Drivers

This section aims to answer the first part the second RQ. It examines the drivers of PPCs in eGovernment projects for the public and the private sector. In total, 5 overarching key drivers can be derived from the 14 conducted interviews.

5.2.1   Resource limitations in the public sector

Resource limitations function as a key driver for PPCs in eGovernment projects and is mentioned in all interviews. Within this chapter, resources refer to administrative

personnel plays. The driver is twofold – it emerges from a local public administration's quantitative capacity and its qualitative expertise. These are influenced by the aversion of the public administration as an employer, the demographic change.

First, all interviewees agree that the *lack of personnel* is an integral driver for a city's need to collaborate with private companies. The lack causes severe capacity constraints that go hand in hand with the increase in tasks and scope of public sector responsibilities [XXX]. [XXX] emphasises that all current crisis, like Covid, the financial crisis and current wars, add on the workload of the overstrained administrative personnel. The daily workload already stretches public sector employees thin. The interviewee admits that "most departments reached their limit". eGovernment projects add on this resource problem as its implementation needs to be executed next to the daily business of an administration. Consequently, current employees are not enough to carry the digitalisation efforts of the administration as well.

Second, the *expertise* needed for the digitalisation of the administration is not available in the public administrations themselves. It often has difficulties to attract experts in needed areas. Private companies can bridge this gap by providing a variety of expertise and experienced employees [XXX]. The private sector can assist in the development of eGovernment projects if their competencies align with project requirements [XXX]. According to several interviewees, the administration often lacks the expertise needed to develop their own solutions, such as IT people. Project management is another crucial area where public administrations often rely on private partners. [XXX] mentions that the municipality engages external partners to handle project management.

For some interviewees, the qualitative and quantitative personnel problem of the administration have two rationales: the unattractiveness of the public sector as an employer as an internal motive and the demographic change including the skilled labour shortage as an external factor.

The public sector is perceived as a *less appealing workplace* and employee by seven interviewees [XXX]. Several factors contribute to the preference of the private sector, citing higher salary, more agile and adaptable structures, and greater flexibility. Only, [XXX] mentioned the job security offered by the civil service positions as the primary and only advantage of the public sector. [XXX] highlights the ongoing endeavours of their municipality to attract qualified employees, particularly programmers, which [XXX] also confirmed as a significant challenge. Consequently, the private sector has access to a broader talent pool to choose from. Given the difficulties in recruiting directly, the public sector increasingly relies on private sector collaboration to access the necessary human

resources. Moreover, [XXX] and [XXX] link this to the shortage of skilled labour, noting that well-educated individuals tend to prefer private companies over public institutions.

Next to this, the *demographic change* is repeatedly mentioned as a key driver for the lack of personnel and expertise within the public sector [XXX]. [XXX] expresses concerns about the upcoming decade, stating that "a third to half of the current personnel is going to retire". [XXX] even describes the demographic change as causing a "gigantic resource problem". As the demographic change continues, the administration's ability to fulfil their tasks will diminish alongside their shrinking workforce [XXX].

In response, [XXX] and [XXX] see the implementation of eGovernment also as a solution for both of the problems: first, to stay a competitive employer, the public sector needs to gain in attractiveness by e.g. providing new equipment and adopting some benefits of the private sector, such as home office. This in turn needs eGovernment, which can currently solely be achieved through the inclusion of private entities. Moreover, local authorities are in competition with each other. Hereby, being an employer that is "the state of the art" [XXX] helps to stay competitive. Second, to be able to stay functional as a public administration, the public sector needs to automate more. This can help to master the daily tasks:

> *"And, of course, the pressure to be able to cope with the tasks in general. The shortage of skilled workers is so great that you have to look at digitalisation as a tool, with process automation, for example, to digitise routine activities. Perhaps an RPA [Robotic Process Automation] can do that all day, every day, which an administrative employee cannot. It's not about replacing employees with machines, it's actually more about being able to manage the tasks."* – [XXX]

These dynamics force the public sector to collaborate with the private sector as they can draw from candidates with more extensive experience and competencies, thus enhancing working environment in the public sector. With a public administration's current skillset, providing eGovernment by themselves is not possible [XXX].

5.2.2 Organisational characteristics and role of public administration

Organisational characteristics of both sectors are a key driver for PPCs. The differences, help to bridge the gaps in eGovernment projects. For instance, private partners support public administrations in innovating meanwhile acting as a kind of role model. Further, this section questions the role of the public administration. Interviewees argue that public administrations do not need specific expertise in all possible areas.

Beginning with the *characteristics of both sectors*, the risk aversion of the public administration a huge barrier for innovation. It hinders the public administration to be innovative and makes the introduction of innovation much harder for employees [XXX]. With the support of private companies, the public sector can make up for its own organisational barriers. Private partners have more ability to innovate and can provide methods, that enhance innovation efforts in public sector projects [XXX]. In addition, "New impulses" [XXX] are important for the public sector to be able to innovate. Both partners create a balance in projects, leading to enhanced eGovernment projects. Moreover, private companies can support public administrations by offering new, suitable products [XXX].

Oftentimes, the private sector is mentioned as a kind of *role model*, at least to some extent. As private companies can work at a faster pace and implement more and newer technologies [XXX], they can benefit local authorities. While the public sector traditionally adheres to classical waterfall project management structures, private companies can introduce more flexible, agile approaches. This shift can lead to a "solution-oriented and less plan-oriented" methodology [XXX]. This is integral for IT-projects as they operate in a fast-paced environment [XXX].

The question about the *actual responsibilities of the public administrations* came up multiple times [XXX]. [XXX] mentioned to "reflect and asked oneself: what are actually the core functions of the administration?".

> *"Nobody is demanding that a company should be able to do everything, but somehow the administration is expected to be able to do everything. They should be able to build, they should be able to issue passports, they should be able to run schools, all of that."* – [XXX]

In this context, several interviewees believe that the public sector is not responsible for providing IT equipment and software. They recognise that eGovernment projects are nor a local authorities' main task neither can they accomplish it on their own. The system is built to be stable and secure. Moreover, interviewee [XXX] is sceptical if the public administration needs that highly skilled IT personnel. Priorities should be set to their actual competencies and governmental duties [XXX].

5.2.3 Efficiency and cost-effectiveness

Increased efficiency, standardisation and cost-effectiveness are important drivers for PPCs in eGovernment projects. Private companies bring expertise and proven,

standardised solutions. Further, PPCs also offer cost-effective and flexible staffing solutions.

The importance of raising *efficiency* is frequently mentioned during the interviews. Especially all seven public sector interviewees emphasised the importance of increased efficiency as a key driver for PPCs. Often, public sector projects are more complicated and inefficient compared to those managed by experienced private sector companies [XXX]. As the public administration is perceived as being particularly legally compliant rather than efficient, private companies can support [XXX]. By collaborating with a private partner, public authorities aim to address efficiency problem, such as accelerating the working speed and reducing the duration of public projects.

The ability of private companies to gain know-how from various projects and transfer proven solutions and methodologies to the public sector acts as a driver [XXX]. As IT-projects are a private companies' daily business, the company's employees can assist in such areas [XXX]. The public sector should make use of solutions developed and owned by private companies, particularly in eGovernment projects. Utilising these existing solutions can significantly increase efficiency, as it eliminates the need to reinvent the wheel [XXX]. Moreover, private companies are well connected and partly exchange information and best practices with each other. In addition, they are better at assemble consortiums to find quick and efficient solutions [XXX].

As the *lack of standardisation* is mentioned several times, the interviewees are convinced that private sector companies can introduce standardisation within the public sector and play therefore a crucial role in these dynamics [XXX]. This happens as the private sector provides a single solution for several authorities. By doing so, the product can be developed by the company in collaboration with various municipalities and cities. By doing so, local authorities can "profit from the experiences of other municipalities." [XXX]. This happens either as other municipalities' feedback is already incorporated into a product or as the pressure of changing a product increase if several municipalities need the same changes. Private companies can then act as a link for inter-municipal collaboration [XXX]. [XXX] goes even further and views this as a knowledge management construct that the private sector provides. Additionally, with the further preference for cloud applications, less individual changes can be done, leading automatically to more standardisation [XXX]. Another beneficial solution is the use of open-source software to provide products that can be applied to other municipal administrations as well [XXX]. However, when a large number of municipalities are being provided by one private company, this can create a "single point of failure" [XXX]. Still, [XXX] is convinced, that the benefits are of greater importance.

Cost-effectiveness and *flexibility* are additional drivers for the public sector to make use of PPCs [XXX]. While new employees are often difficult to find, some projects do not require permanent staff. The private sector can then introduce greater flexibility and adaptable solutions for staff problems. The costs of hiring an employee who might not be needed after a specific project is higher than employing an external entity [XXX]. Further are the costs of hiring in the long-term higher than collaborating with external employees, since long-term costs arise with new employees such as pensions entitlements [XXX]. This can be especially advantageous as the IT sector is a fast-paced environment [XXX]. However, if costs are lower with external providers is doubted by some interviewees. Nevertheless, the gained flexibility is appreciated by public sector employees [XXX].

In this context, [XXX] mentioned a partly failed PPP, which was converted into a public IT service provider. Their learnings are especially high in terms efficiency. Hereby, the polluter pays principle was adopted to introduce efficiency into public IT-projects [XXX].

5.2.4 Technological advancements and external pressure

External factors are perceived to drive the use of PPCs for eGovernment projects too; in particular, technological advancements in combination with societal pressure. Moreover, legal and political forces, further push public administrations to collaborate with private companies. Additionally, funding opportunities and budgetary constraints influence to estblishment of PPCs.

Technological advancements within the private sector are shifting the need for PPCs. [XXX] sees a mind shift of the administrations' employees as the outside world changes. Along with the private sector bringing out new technical solutions at a fast pace, the need to keep up with that pace and to implement these new technologies is a significant driver for public entities [XXX]. PPCs are hereby integral as private companies can provide the public sector with more advanced and up-to-date solutions [XXX]. This in combination with societal expectations to use new technologies drives the need for external personnel even more.

As most new tools and technologies provided by the private market are used by citizens themselves, their expectations towards the public sector are increasing. This leads to an increased *societal pressure*. Citizens feel a desire and expect to use these services in the same ease in interactions with the public sector as well. This is particularly important is this when public administrations need to shut down for a while, meaning no services are available. [XXX] even titles the digitalisation of the public administration as a factor influencing democracy. Citizens are expecting their public administration to be reachable and available. Otherwise, the trust in government decreases along with its legitimacy.

Even so private companies perceive the lack of eGovernment applications as a handicap to build up their company in Germany. If, for example, approval processes take too long, companies will open their business in other EU states. The overall societal pressure relating to eGovernment in Germany, enhances the openness towards PPCs [XXX]. Public demand for better and more efficient services can pressure public entities to seek private collaboration in order to improve their service delivery and operational efficiency.

Laws can act as a driver as its contents need to be fulfilled. Some interviewees mention the OAA as an example for *legislative pressure*. Even if the goals are not achievable, they do function as a driver for an awakening. The public sector feels the pressure in the obligation to provide online access to public services quickly [XXX]. To fulfil this in the given amount of time, private companies are needed. Other legal drivers can be standardised contracts and framework agreements [XXX]. [XXX] perceives standardised contracts as exceptionally helpful. The interviewee mentions that the selection and amount of these contract grew and developed over the past years, making PPCs more viable. Adding to local and national legislation, is the legislative pressure coming from the EU-level a driver. This once again, pressures German administrations to act.

The current government plays an integral role in the selection of themes to focus on during their legislative period in case *political pressure* exists [XXX]. Therefore, personnel from higher political positions need to be included in large eGovernment projects as they can function as a driver for such by being motivated to enhance current efforts [XXX]. By influencing the importance of eGovernment for municipalities by e.g. providing monetary resources or increasing political will for eGovernment, PPCs are affected by these decisions.

Diving deeper into monetary resources, *funding opportunities* demonstrate an integral driver for cities and municipalities to conduct PPCs. If they are given, projects can be executed [XXX]. Especially grants are of high importance [XXX]. Additionally, not only funding possibilities but also *budgetary constraints* can function as a driver. As the budgetary plans are inflexible within the public administration, it is complex to get the financial resources for new, not previously approved projects. Private sector companies have more financing possibilities than the public sector [XXX]. They gain access to financial resources more easily and flexibly, especially when considering projects with high costs [XXX]. By means of this, the private sector can achieve more viable financing models and solutions. In both, funding opportunities and budgetary decisions, politics play an integral role. Receiving a budget for external personnel is more probable if a politically supported project is conducted. Moreover, [XXX] perceives that new hires for the same projects are less likely to be accepted than the inclusion of private partner.

5.2.5   Positive perceptions & regional market conditions

Two smaller drivers are mentioned during the interviews: positive perceptions due to previous experiences as well as the preference for regional markets.

Previous successful PPCs can drive further collaborations. *Positive outcomes* from initial projects build trust and demonstrate the potential benefits, encouraging more partnerships [XXX]. The perceptions are also on the micro level an integral driver for the continuation of PPCs or new ones. Once a collaboration has worked well, the public sector is more open to continue with a certain company [XXX]. Therefore, references and the reputation of a private company are an integral aspect. Next to the intrinsic will to use PPCs due to positive perceptions, also the regional availability of private companies appears to be an important factor.

Interviewees especially mentioned the *regional situation of the private market* as a driver. Public administrations value regional companies and set the focus on them. Having a broad landscape of private companies can be beneficial for PPCs [XXX]. Especially start-ups and SMEs that are open for collaboration are valued. Further, the collaboration with regional partners is perceived as functioning well [XXX]. While not all interviewees noted the market conditions as a driver, this is particularly true for places with a university infrastructure. However, the focus is on the personnel resources. Interviewees residing in urban regions expressed satisfaction with the presence of highly educated and innovative employees in their nearby regions, in contrast to rural areas where such professionals are scarce. This personnel functions as a driver for PPCs as they are more open for change. That the opposite mind set of personnel creates a barrier is presented in the following section.

5.3   Barriers

Like the preceding section 5.2, is this section's purpose to answer RQ 2. In contrast, this section focuses on the barriers that eGovernment projects encounter when conducted in collaboration of public and private partners.

5.3.1   Organisational and cultural structures of public administrations

The organisational and cultural structures within public administrations impact PPCs. Connected to this are lengthy decision-making processes, bureaucratic procedures, and hierarchical settings. The career path of civil servants, fear of making mistakes, and resistance to change further hinder the success of eGovernment initiatives. Additionally, capacity constraints and silo thinking within public administrations prevent efficient collaboration.

Decision-making and leadership abilities are closely linked to *organisational structures.* Several interviewees criticize the unclear and lengthy decision-making processes within public administrations [XXX]. Good ideas often fail to be implemented as they get lost in bureaucratic procedures while other times, waiting times are too long, leading to projects being outdated again. With the long communication cycles, problems get lost in translation from the lower-level civil servant to the upper one. This involvement of numerous committees and boards leads to delays, making the collaboration for private companies more difficult:

> *„And that's what makes life difficult for us sometimes because we realise that nothing is progressing. It takes time. Decisions are delayed, decisions are pushed back and forth, hidden behind some committee. It then takes a very long time for some decisions to be made because thousands of people want to and are allowed to have their say. These are the problems that we then struggle with during the projects“.* – [XXX]

Oftentimes public entities are bound to overly strict legal requirements and *bureaucratic processes.* [XXX] criticises that a clear, holistic structural approach to eGovernment is lacking, making it harder for private companies to finalise projects [XXX]. As the public administration is sometimes structuring their procurements based on laws and regulations, some projects might be dependent on other projects. Therefore, projects realise delays and responsibilities may diffuse. On top of this, the conservative project structure in public sector projects is perceived as a barrier. Interviewees call for a reduction in bureaucratic activities and hope for faster, leaner processes [XXX].

The roots for these organisational issues lie partly in the career structure for civil servants. The top-down structures in public administrations becomes often times a barrier, creating dependencies on higher administrative levels [XXX]:

> *"In all seriousness, the drivers* [of PPCs] *are people who are as high up as possible in a certain position and who say that they would like to do this."* – [XXX]

Specifically, this *hierarchical structure* is perceived by four private sector interviewees as a primary organisational barrier [XXX]. This results in the administration being overly cumbersome, causing slower and less flexible workflows. [XXX] describes the organisational culture as "conservative". Less experienced employees have limited decision-making abilities, further complicating the situation. Sometimes, when public servants lack the competencies to make decisions, there is no proper responsible persons [XXX]. Additionally, the fear of making mistakes results in a hedging mentality among

civil servants [XXX]. [XXX] and [XXX] attribute this to a lack of an error culture, restraining employees from taking responsibility for decisions.

The individual factor plays an integral role for the acceptance and the successful outcome of PPCs [XXX]. Especially innovation driven themes and their usage is dependent from public sector employees. The previously mentioned structure impacts the employees will to change, particularly among those nearing retirement. While motivated employees can drive change and embrace external support [XXX], many interviewees report a lack of motivation and the mentality of the public sector as a barrier [XXX]. Public sector resistance and hesitance to change further complicates the adoption of new working methods and innovative approaches. [XXX] cites fear of losing control, job security concerns, and reluctance to change established procedures as reasons for this resistance. Still, the willingness to include private entities is essential for the success of PPCs [XXX]. [XXX] describes it as the "active role to identify that they [the public administration] is a client of a service provider." This however requires a mind shift in the public sector by recognizing the need for external support [XXX]. Along with this, the will to change among internal personnel is a crucial factor for the progress of eGovernment in Germany. Yet, employee structures are still marked by the current demographic situation within public administrations, influenced by aging employees at the management level who do not prioritize digitalisation, is another barrier. As one interviewee stated:

> *"So this internal structure would be really cool if it were changed so that people who are keen on change would also be involved."* – [XXX]

Yet, there might be motivated personnel. However, due to these organisational structures, it is difficult for public sector employees with good, innovative ideas to implement such [XXX]. To note is that the development of ideas is not per se not wanted according to [XXX], it is rather the real innovations that uphold the administration as they would need to undergo significant changes. Additionally, due to the high workload, they cannot engage in all the projects. [XXX] perceives these capacity constraints also as a barrier for PPCs. Projects get delayed because the public sector cannot keep up with their responsibilities in collaborative efforts, such as the testing of new software.

Besides all of this, the *silo thinking* within public administrations is a significant barrier. Interviewees noted that public servants often focus on their own departments, neglecting the importance of inter-departmental and inter-municipal collaboration [XXX]. This mentality prevents the transfer of successful PPC solutions across departments. Other accompanying problems that complicate PPCs are the lack of standardisation, non-interoperable interfaces or different terminology used by similar departments in various

cities [XXX]. Overcoming these cultural barriers is crucial for the successful use of PPC and the digitalisation of public administration [XXX].

5.3.2 Organisational and cultural disparities

Differences in organisation and culture between public and private sectors can lead to misunderstandings and conflicts. Public entities operate under rigid structures and clash with the private sector's flexibility and speed. In addition, different objectives make collaborations more exhausting.

One interviewee introduces a comparison to describe the *divergences between the public and the private sector*, especially when collaborating with start-ups.

> *"An administration like that is a tanker. And then a start-up comes along, a speedboat. The tanker goes whoosh and doesn't even realise that it has broken something. Yes, you're bigger, but whether it always works better, whether you can work well together, is the other question. That's right because we don't get round the bend that quickly."* – [XXX]

Start-ups, and most other private companies, are operating faster than the public administrations. Often, public administrations need more time to make things happen. Hereby, the cultural and organisational disparities clash, which might lead to frustration within the project [XXX]. Nevertheless, global IT players struggle as well with the local authorities and their specialities [XXX]. Barriers may arise if the private sector does *not have knowledge* about the public sector:

> *"And with others, well, sometimes you have the feeling, okay, now I've spent hours and days explaining public administration, the local authority, and I've had to pay you to listen to me, to be productive at all."* – [XXX]

The public sector is perceived as having special requirements and elements by various interviewees. Therefore, especially public sector employees see it as beneficial if the private actors know these special characteristics of the public sector.

Another difference lies in the *different objectives* of both partners [XXX]. The public sector fear sometimes to be seen as a "cash cow" [XXX] by the private sector. The fear of being used is present. Especially the public sector perceives the divergence of economic interests as a potential barrier. Hereby, the two sides are presented: the private sector with its main objective to earn profits vs. the public sector, with the objective to provide well-suited, sustainable services for their citizen [XXX]. Hence, both actors need to align their

interest, creating a "win-win situation" [XXX]. [XXX] mentions that none of the sectors want to harm the other. Both sides have their objectives and goals, even if diverging.

Therefore, a mutual understanding from both sides for various interviewees is integral for a successful collaboration without barriers [XXX]. While the public sector needs to gain a deeper understanding for the private sector, private companies need to understand the public sector with its prolonged processes. Additionally, experiences with other public organisation can help to enhance the collaboration. Hence, public sector employees are contented if they can see that a private company comprehends their structural attributes, or even have reference projects. [XXX] also sees the need for more lateral entrants in public administrations as they have the background knowledge to understand private partners.

5.3.3 Lack of contract- and project management expertise

Concerning the various project stages, all interviewees noted a frequently encountered barriers: the lack of expertise within contract- and project management. This is a significant barrier in PPCs in eGovernment, as unclear objectives and contracts often lead to diffiulties. Effective communication and expectation management throughout the project is frequently insufficient, causing misalignment between public and private actors.

Starting with the *lack of contract management skills*, these become particularly evident within the first phases of PPCs. The majority of interviewees mentioned a clear contract management as being integral for PPCs:

> *"If you make it too easy in advance [in the beginning phase] and somehow go into a project with a honeymoon-feeling, then it usually ends up being difficult and disgusting." – [XXX]*

This phase is exceptionally important to avoid problems in the later project stages. A well situated and clearly stated contract accelerates finding solutions and provides a basis for the collaboration [XXX]. However, it is often perceived to be a challenge; setting up the contract is often a lengthy procedure [XXX]. As an element of one of the early phases of PPCs, the beforementioned disparities of the public and the private sector become apparent. Accordingly, this phase is suitable to solve existing disparities in the objectives. To do so, the project scope needs to be well-established. Some interviewees perceive difficulties with this stemming mainly from the public partner [XXX]. Oftentimes, local authorities do not know exactly what they need. They do not have clear objectives of their goals, which leads to unstructured contracts that impose a self-inflicted barrier [XXX]. Then adjustments during the collaboration are necessary, leading to the risk of failing the project [XXX]. As a solution, [XXX] suggest hiring private consultants for setting up the

contracts for bigger projects if not done often. In the interviewee's opinion, this initial stage needs to be done properly and is too important for using a learning by doing approach. However, with the increasing quantity of projects, local levels themselves are certain, that the needed knowledge will be developed [XXX].

Continuing with the second missing skill in public administrations: the *lack of knowledge about project management*. The knowledge needed to conduct PPCs is broad as it includes various spheres of project management [XXX]. While guidelines are provided, [XXX] stresses for not only having the know-how but also the "competence to implement". The inability of the public sector to lead projects is mentioned as a barrier by several interviewees. This lack can create information asymmetry between the parties [XXX]. Misunderstandings may arise if technical terminologies are not adequately clarified and understood by both sides [XXX]. For [XXX], the lack is most noticeable at the stakeholder management level. The interviewee points out that the public sector sometimes loses oversight of projects, leading to a lack of awareness about each partner's activities. This barrier, then worsens as there is no plan of what is executed when and how to measure the success of it. Often, this leads to private providers managing other private providers, leading to a "perverse" situation [XXX].

To avoid some of the barriers, expectation management is important [XXX]. This is perceived an integral factor throughout the whole collaboration, for instance in case of price changes or the level of complexity of some tasks [XXX]. Three interviewees felt that especially at this stage, personal non-virtual communication can help to enhance these processes and the relationship [XXX]. However, the lack of clear and honest communication is perceived as a barrier of PPCs by various interviewees [XXX]. Communication is seen as an integral factor for a successful project. However, oftentimes, private companies try to communicate as early as possible with the public sector without success. The need for honest communication is as well evident. Sometimes, uncomfortable questions are necessary for the project [XXX]. There should be no fears of also criticising and pointing our grievances to project partners [XXX]. This is especially important at the end of projects. Not only the process is to be bespoken, also the end result needs to be clearly communicated. Public actors are often reserved [XXX]. [XXX] criticises that public administrations are sometimes too obliging to private partners even if their deliveries are not as expected. In addition to the single phases are also the transition between single project phases objected as a barrier [XXX]. The need to work more on equal terms is integral for PPCs, but not always given at the moment [XXX].

Due to all these barriers within the project phases, [XXX] and [XXX] pledge for the use of Key Performance Indicators (KPIs) such as milestones and quantitative measures. By

doing so, projects could be executed with more monitoring and transparency. [XXX] even sees a "Centre of Excellence" consisting of public and private sector employees as a suitable solution for expensive projects. Hereby, the operative side of projects should be discussed, and clear project management rules implemented. Other suggested methods include taking smaller steps in projects in order to bring in some focus [XXX].

5.3.4   Complexity of public procurement

All interviewees identify the complexity of public procurements as a key barrier to PPCs. These legal hurdles can significantly impede collaboration efforts. With its bureaucratic processes, public procurement influences the formation of PPCs by slowing it down or preventing its occurrence. Bureaucratic processes, knowledge deficits and legal complexities deter in particular SMEs from collaboration. [XXX] notes that PPCs sometimes fail because procurement processes take too long, preventing the public sector from getting what they need in a timely manner.

Despite these challenges, the public sector is still bound to use public procurements. One of the first problems related to public procurement are the *knowledge deficits* in the public sector. Not all civil servants understand how to set up a procurement, as barriers exist in describing the desired product and its requirements [XXX]. This is connected to the need of knowing the solution to a problem which is not always possible [XXX]. This leads to some procurements that are including requirements that are impossible to meet [XXX]. A lack of knowledge about the possibilities within procurement law is identified. [XXX] notes that "a lot of administrative staff don't know what options are actually available, partly because of the lack of time, partly because they simply have other tasks". Furthermore, various interviewees struggle with the implementation of alternative, more agile forms of PPCs as they are seen as risky in the light of the procurement law [XXX]. [XXX] municipality had to shut down a collaboration focusing on innovation because the outcome is unclear, leading to concerns from their lawyers.

With the *procurements laws strong requirements and characteristics*, several interviewees understand why private companies hesitate to collaborate with the public sector [XXX]. Especially SMEs are oftentimes hindered to enter the public sector market. Public procurements tend to be an entry barrier for such enterprises, especially when new to the market. Their lack in references, dependency on fast payments and capacity constraints leave them off the competition [XXX]. Not only SME are describing the procurement law as "dysfunctional" [XXX]. Even larger private players see discrepancies in its execution [XXX]. Some have the impression, that the tenders are awarded in a non-transparent way. In addition to this, deter private companies from bidding because of lengthy processes and uncertain outcomes of procurement procedures. Tendering and

procurement procedures should not be economically risky for private companies, according to [XXX]. Even if a procurement is won, its final implementation is not secure. [XXX] and [XXX] are concerned about the "vulnerability" of the law, as, for instance, competitors can start lawsuits against certain procurement decisions. On top, [XXX] and [XXX] see difficulties to communicate due to public procurements. Communication with administrations is then perceived as challenging, sometimes even impossible due to regulations.

The complexity continues throughout the *decision criteria.* Despite an increasing number of IT procurements being decided through a mix of price and quality, [XXX] still experiences a focus on prices, leading to "unsustainable tenders" and resulting in switching partners and increased use of resources [XXX]. Therefore, the interviewee calls for more transparency in procurement procedures, especially concerning the breakdown of prices. [XXX] however sees also upcoming difficulties if price is not the major decision factor, as regulations need to be adapted and problems can occur. With all its flaws, the public sector sometimes cannot generate the offers they need to get the best-suited product.

Despite all the challenges procurement law brings, its importance is mentioned several times [XXX]. With its heterogeneous possibilities, it is seen as an integral instrument [XXX]. [XXX] and [XXX] view the whole procurement process as "manageable":

> *"This is an important means of control and we don't have to make things too complicated for ourselves sometimes. The rules are very simple and clear. If we stick to them, then it works. Then it also works quickly." – [XXX]*

Therefore, [XXX] sees the necessity of educating civil servants about it. Although EU-wide tendering procedures in larger eGovernment projects tend to frighten the interviewees [XXX], some interviewees argue that they are manageable as these laws also work well in other EU states [XXX]. Nonetheless, [XXX] observe restraints of the administrations due to slowed-down processes, occasionally necessitating special lawyers to manage them [XXX].

Still, the majority of respondents would like to see public procurement law speeded up and simplified, with more flexible alternatives. Two interviewees empower innovation clauses that some cities have implemented. With them, also eGovernment projects below a certain sum can be executed without the use of procurements to test certain technologies. [XXX] proposes the partial use of Artificial Intelligence to examine procurement proposals in order to accelerate the processes. [XXX] goes further by proposing a platform, where

basic conditions are clarified, and best practices are accessible for the public sector, leading to less lengthy, risky, and intense procurements.

5.3.5   Other regulatory requirements and political challenges

Despite existing procurement laws, additional regulations and legal requirements pose substantial obstacles for PPCs. Public administrations face challenges in adapting to new technologies and complying with GDPR, particularly affecting non-EU companies. Political instability or close votes serve as additional barriers. Frequently, laws and regulations must be amended to ensure digital legality. This situation is encapsulated by an [XXX] who highlighted the often-overlooked bureaucratic intricacies:

> *"And many people don't even realise what a rat's tail there is behind it.*
> *And then they say, yes, let's do it quickly. And then you say, yes, we can do*
> *it quickly. It's just illegal." – [XXX]*

This *complexity of laws and regulations* further poses another major barrier. Laws often contradict each other, and the sheer volume of regulations complicates compliance [XXX]. Growing requirements for certain projects [XXX] are particularly challenging for Small and Medium-sized Enterprises (SMEs) with limited capacities. Furthermore, the increasing preference—and often requirement—for open-source solutions reduces the pool of suitable private partners, thereby limiting collaboration options [XXX].

Beyond this, long established contracts also act as barriers when local authorities aim to innovate or establish new processes with private partners [XXX]. Additionally, the multitude of regulatory layers—ranging from local to EU levels—adds to the complexity [XXX]. Hereby do the needs at the EU level often surpass the capabilities of Germany's public administration, further complicating PPC efforts [XXX].

The fast pace in the technological environment is also perceived as a barrier. New technologies such as AI raise questions relating to the legality of the use of these products. *Legal frameworks tend to be provided with delay*. This leads to uncertainties within PPCs:

> *"We are also working together on this […] because these are also things that*
> *all municipalities are asking themselves to some extent, all federal states are*
> *asking themselves this and the solution is already available on the market, but*
> *there are still so many question marks when it comes to using it at all. So that's*
> *where the legal situation is still unclear or not yet on the road." – [XXX]*

Although public administrations are willing to engage in PPCs to implement new technologies, [XXX] criticises in particular higher-level governments. The regulator are

not reacting fast enough to new technologies, leading to a lack in clarity by public administrations. For instance, due to the variety of products, public administrations cannot filter which product suits best as they do not know which regulations to follow.

Non-EU companies face even greater regulatory hurdles. The *General Data Protection Regulation (GDPR)* is a "huge barrier" [XXX] for most public sector interviewees [XXX]. The law enforces that data remains within the EU, a requirement that is challenging for companies outside the EU, especially for major IT providers. Consequently, municipalities would be prohibited from working with US-based businesses, resulting in the exclusion of major IT companies. Here, municipalities have difficulties to decide on their point of view. However, [XXX] notes that these players are starting to adapt their business models to comply with German market regulations. On the contrary, another interviewee mentioned that public administrations sometimes adapt and use these major IT companies after careful consideration.

As a reaction to all these barriers, interviewees emphasise the need for more concrete (e.g. interoperable interfaces), efficient (e.g. the avoidance of dual structures) and sustainable formulation of legal requirements to facilitate better implementation and utilisation of technologies by public organisations with the support of private companies, while ensuring a high quality [XXX]:

> *"I believe that the state should be more concerned with how it can actually formulate requirements in a more concrete, efficient, and sustainable way so that they can be better implemented and utilised by private companies. And that is, I believe, what is extremely important."* – [XXX]

This pledge for the simplification and centralisation of requirements is supposed to happen by upper-level politicians [XXX]. [XXX] acknowledges that digitalisation of public administration is a long-term effort that should be pursued independently of political changes. However, [XXX] mentions that their working environment is politically driven. As politics play a part in public administration that is not to be ignored, ongoing projects might be affected by unforeseen changes imposed by higher-level administrations, such as the introduction of new legislation, requirements, or technological alterations [XXX]. This may hamper collaborative endeavours and hinder the progress towards final achievements. In addition, one interviewee noted the practice of lobbying. The interviewee emphasised the vast and obscure network that is difficult to navigate [XXX].

Even in the absence of new requirements, political presence often influences public administrations and are generally seen as a barrier for PPCs [XXX]. The "artificial borders" imposed by legislative periods are subject to substantial criticism, particularly

by [XXX]. Political change should not have a direct impact on all areas of administration. However, experiences show differently:

> *"One example [...] a local authority, said yes, it would all fit. Then we were told, well, elections are coming up soon, so there will be new mayors. And then after the election they said: yes, now we have to arrive, now we have to look here with the administration. And that alone is two and a half years in total. Six months until the election and then two years again. And then it's another two years until the next election. So, it's partly so short-term that you say, yes, you have to start today. It just takes five years. That's one legislative period."* – [XXX]

In some cases, political and legal inefficiencies cannot be entirely separated. For instance, budgetary laws are frequently mentioned as a significant barrier. Local governments are bound by strict budgetary constraints, including the necessity to establish budget plans long before PPC decisions are made. These plans are inflexible, requiring the anticipation of future projects [XXX]. Payments spread over multiple years further hinder participation from start-ups, limiting their ability to engage in collaborations [XXX]. Other budgetary issues include sudden declines in financial aid from upper government levels [XXX] and suboptimal distribution of funds [XXX]. Additionally, [XXX] identifies the lack of monetary resources as a significant barrier, noting that public funds are difficult to obtain due to stringent restrictions. [XXX] pledges for the deviation of budgetary rules in order to be able to work more iterative.

5.3.6   Negative perceptions and asymmetric market structures

Finally, the reluctance of the public sector to collaborate is pushed by two additional factors: negative perceptions and obscure market conditions. The former affects especially employees with responsibility. [XXX] blames big infrastructure projects that went wrong to cause *negative perceptions*. Due to these past perceptions of PPCs, local authorities are reluctant to use them [XXX]. Besides this, the public sector is afraid to collaborate with the private sector due to negative press and media attention.

Market conditions are bifold; while some interviewees view *market structures* as a driver, they are perceived as an obstacle at times. With the presence of multiple privately owned companies in the market, the public sector lacks the ability to selectively screen these companies [XXX]. Identifying the appropriate partner and model can be a challenging and time-consuming process [XXX]. eGovernment projects are especially impacted by this as of the significant fluctuation of enterprises involved:

"The first thing is how well does the market observation or market analysis work? In other words, how well do I know who is offering what on the market? You need to know this. And then, what is the quality of these companies? Where can I find information about them? Especially now in this fast-moving digital sector, companies are created overnight and then disappear again overnight. Especially if they are smaller companies. " – [XXX]

This raises the risk in eGovernment PPCs. This is especially true for start-ups. Various interviewees are sceptical about them, as their success rate appears to be low. In combination with the need for long-term services, these risks demonstrate a barrier. Ultimately, it is not only companies that are hard to screen. It is often the matter that public employees lack awareness of the current possibilities and benefits that eGovernment provides.

5.4 Summary of drivers and barriers

Table 2 Summary of drivers and barriers

Drivers		Barriers	
5.2.1	**Resource limitations in the public sector** Resources refer to administrative personnel. The driver is twofold, relating to quantitative capacity in local public administrations and the qualitative expertise. These factors are influenced by the preference for the private sector as an employer and the demographic change.	5.3.1	**Organisational and cultural structure in public administration** Connected to organisational and cultural structures in public administrations are lengthy decision-making processes, bureaucratic procedures, and hierarchical settings. Additionally, capacity constraints and silo thinking within public administrations prevent efficient collaboration.
5.2.2	**Organisational characteristics and role of government** The combination of organisational characteristics of both sectors drives PPCs. The private sector supports public administrations in innovating, acting as a role model. Further, the role of the public administration is questioned, stating that inhouse expertise might not be as necessary as sometimes perceived.	5.3.2	**Organisational and cultural disparities** Differences can lead to misunderstandings and conflicts. Public entities operate under rigid structures and clash with the private sector's flexibility and speed. Further, different objectives make collaborations more exhausting.
5.2.3	**Efficiency and cost effectiveness** Increased efficiency, standardisation and cost-effectiveness are important drivers. Private companies bring expertise and proven, standardised solutions. Further, PPCs also offer cost-effective and flexible staffing solutions.	5.3.3	**Lack of contract- and project management expertise** The lack of expertise within contract- and project management is a significant barrier, as unclear objectives and unstructured contracts often lead to difficulties in projects. Moreover, misalignments between public and private actors can occur.
5.2.4	**Technological advancements and external pressure** Technological advancements and societal pressure function as drivers, as citizens expect up-to-date, efficient public services. Legal and political pressure, further push public administrations to collaborate with private companies. Additionally, funding opportunities and budgetary constraints influence to establishment of PPCs.	5.3.4	**Complexity of public procurement** The complexity of public procurement hinders collaboration, with lengthy, bureaucratic processes and intransparent decision-mechanism. Knowledge deficits in public administration, particularly in describing requirements, hinder PPCs. Legal complexities deter private companies, especially SMEs, from applying.
5.2.5	**Positive perceptions and regional market conditions** Previous successful PPCs drive further collaborations by showcasing potential positive outcomes. Regional availability and the presence of private companies, especially start-ups and SMEs, are important factors as public administrations value collaborations with local firms.	5.3.5	**Regulatory and political challenges** Additional regulations and legal requirements pose substantial obstacles. Public administrations face challenges in adapting to new technologies and complying with GDPR, particularly affecting non-EU companies. Political instability serves as an additional barrier.
		5.3.6	**Negative perceptions and asymmetric market conditions** Negative perceptions stem from past failed projects and media attention. This makes local administrations hesitant to make use of PPCs. Additionally, the complex and fluctuating market conditions, particularly in the fast-evolving ICT sector, pose significant challenges in identifying reliable partners for eGovernment projects.

6 Discussion

The use of private companies for eGovernment projects is an essential tool to make the provision of online services and a digital administration even possible. The perceptions are mainly positive, with some concerns about potential dependencies. While the public sector lacks resources in various domains, the private sector bridges these gaps when collaborating. Yet, the collaborating actors also face barriers, for instance of organisational and legal nature.

While the combination of PPC and eGovernment in the German context provides insights in an under researched domain, the results appear to be close to already existing literature on the separate topics of PPC and eGovernment. On the one hand, the identified drivers are similar to eGovernment challenges in existing literature. On the other hand, benefits and drawbacks of PPCs are overlapping with the results and can be transferred to the topic at hand. Therefore, the research results present a mix of already known influence factors by combining both literature strings. The focus of this research however presents more than just a structured repetition of already known factors; it works out the specialties of PPCs in eGovernment efforts. Without private organisations, public authorities would not be able to reach their eGovernment objectives any time soon. In the following, the results from the foregoing section are discussed. Afterwards, implications for theory and practice are derived.

6.1 Insights

This section discusses the results given by the 15 interviewees in the interviews about PPC in eGovernment projects. The structure is accordingly to the subsections in the section 5: at first, the perceptions are discussed which relate to RQ1, followed by the drivers as well as the barriers. Finally, ambivalent results are examined. This structure reflects the complexity around RQ2.

6.1.1 Perceptions

The perceptions of PPCs in eGovernment projects reveal a complex interplay of the need of PPCs, perceived as positive perceptions versus the risks, perceived as negative perceptions.

The terminology of PPC sparked some uncertainty. Its concept, however, is widely understood. The difficulty in categorising the term is not surprising due to the varying terminologies used in the sphere of public and private collaboration efforts. As the terms lack a generalisation, their concepts are difficult to gather; especially included and

excluded forms of collaboration. However, the term appears to be self-explanatory, which can also be seen in the openly defined explanation of the term in literature (see Kivleniece and Quelin 2012). As expected, the perception of the term PPP is more sceptical. This scepticism towards PPPs indicates that despite their potential benefits, the risks and historical failures have left a lasting impact on their perception. German public authorities criticised the use of PPP heavily in the past (Thüringer Rechnungshof 2012). Along with this, negative perceptions of PPCs can be attributed to various failed projects. While happenings such as the *Berateraffäre* shaped the perceptions of private companies being involved in public organisations, the variety and quality of services provided by the private sector should not be generalised. Especially in the IT context, consulting services often include IT expertise.

The broad spectrum of services mentioned, demonstrate the heterogenous tasks that eGovernment projects encompass. While the interviewees from the public sector are relatively homogenous, the private sector showed a variety of backgrounds and focuses. As the implementation of eGovernment is not the main task of the public sector, this shows the complexity of eGovernment projects, with the various levels and focuses of expertise are needed in such undertakings. Private partners are indispensable in eGovernment projects. While this is positive for the private sector, the question remains if the public sector brings itself into high-stakes dependencies. Underlying these dependencies concerns might be the fear that public administration are not able to run a fully electronic Government on their own. Within the interviews, problematic structures such as body leasing are mostly perceived by private partners as a problem. Raising more awareness for public authorities might be integral.

Furthermore, private partners are not only needed for the implementation of eGovernment in Germany, but they are also needed afterwards during the maintenance and utilisation. This continuous need for private companies makes the public sector dependent on private companies. Hereby, three main problematics can lead to an asymmetry of power relations and displaced market structures. Various public sector interviewees see already small tendencies for (1) monopolistic structures. It appears to be problematic that both sectors said that local authorities would break down if private partners would be omitted. This leaves the private sector with high market power, being able to steer prices or even participate in governmental affairs. Such power imbalances can lead to conflict, with the more resource-owning partner having more bargaining power (O'Leary and Vij 2012). Next to this, are (2) vendor lock-ins not to be underestimated. The concerns about possible vendor lock-ins, are also persistent in literature (see Berger 2021). Not only leaves this more controlling power to the private player, but it is also often connected with the loss of control and high costs. Using private sector employees as substitutes for public sector

employees creates (3) vicious cycles, questioning the long-term sustainability of PPCs. With every collaboration, public administrations might lose some knowledge of their own organisation, i.e. the functioning of software. The increasing reliance in combination with the loss of knowledge of the own organisation is also observed in other cases. Especially the latter is often also criticised by experts (see Alford & O'Flynn 2012). These three key problematics reveal significant weaknesses in current PPC constellations. However, the focus on open-source solutions seems to be a positive trend, trying to detach from certain privately owned software solutions. This is in line with current research and practices in other municipalities (see Berger 2021; Brunzel 2021). Benefits mentioned by Berger (2021) are the realisation of synergy effects, the collaboration with various private partners as well the possibility to share the developed solution. Although not all private companies are familiar with open source, it is to be expected that the private market will adapt to the needs.

The positive tendencies towards PPCs are integral for eGovernment projects. Private sector companies bring new impulses such as new technologies and ways of working into the public administration. It seems to be questionable if these developments would occur without private sector involvement. Additionally, the lack of digitalisation is noted by all interviewees. As Germany is way too far behind in digitalisation, the public relies on private companies, however, also mutual dependencies are seen. This might lead to less power being given to the private sector as criticised in the preceding paragraph. While various interviewees perceived the importance of building public expertise, this is rather seen in a very limited context. Even the reduction of PPCs is mentioned by solely single interviewees. However, this opinion is contradicting most of the interviewees' views.

Overall, the conflict of the need for PPCs vs the risks of using PPCs can be observed. While its use will most probably continue, potential risks need to be mitigated in order to maintain a functioning and independent public service. Especially in the context of eGovernment, valuable data is being shared. Therefore, risks need to be minimised as much as possible, meanwhile not losing sight of the practical importance. Thus, raising awareness within the public sector is necessary, to fully benefit from PPCs.

6.1.2   Drivers

Resource limitations are the most prominent driver for PPCs in eGovernment projects in this research. All interviewees consider the lack of quantitative and qualitative personnel as an integral factor for the need of PPCs. The dual nature of this limitation in the public administration highlights its dimension. However, this driver is not new to research; Mergel (2019) observes the shortage of skilled employees in German public administrations as persistent. Especially state and, the observed group of local authorities

lack in personnel with competencies in developing organisations and digitalisation. However, building internal capacities is important to keep the control of own systems (Cordella and Willcocks 2010). The perceived reasons for the lack of personnel by the interviewees are in line with current research: as public institutions are in competition with the private sector for new employees (see Halsbenning et al. 2021) it appears to be one of their main difficulties in attracting well-educated personnel. Interestingly, interviewees from both sectors came to this conclusion. As mentioned, the public sector is lacking behind in terms of salary and flexibility. However, the first contradicts literature. While salary is mentioned as the most prominent advantage of the private sector, multiple factors are more influential. These include flexible working hours, meaningful and diverse work as well as career opportunities (Stich & Schwiertz, 2021). Especially the latter is difficult to change in the public sector. Nevertheless, these incentives might be a solution to gain the needed and desired employees by the public sector. Further, the demographic change does not spare the public sector. This is especially a problem for the ICT departments (Halsbenning et al., 2021). The potential efficiency gains of implementing eGovernment are therefore enormous (Brunzel, 2021). This leads to the continuous need to find alternating solutions; such solutions might be the advancement of eGovernment, with the need to automate and the use of PPCs to achieve this.

Interestingly, the emphasis on efficiency as a key driver for PPCs is in particular documented for public sector employees during this research. The perception of public sector projects being more inefficient than those managed by the private sector is not surprising. Although the interviewees are certain that the transfer of knowledge and best practices can lead to substantial improvements in public sector efficiency, scholars cannot observe this effect for sure (see Torchia et al. 2015). However, this might be true for eGovernment projects as applications and processes are already developed, some even widely established. The corresponding driver of enhanced standardisation of eGovernment applications, seems to be crucial to the public sector. As said in the interviews, the private sector has various experience from multiple public sector projects. By this, their supplied service or product can be developed through various iteration rounds by multiple local administrations (Callens et al. 2024). This appears to take away added workload from civil servants. With already adapted solutions, the private sector can probably provide the desired outcome at a faster pace. Moreover, each administration demands the best solutions for their city. Standardisation therefore emerges as an important driver where private sector involvement is fundamental. By collaborating with various public players, private companies foster inter-municipal collaboration. As seen in the results, this collaboration does not necessarily need to be realised without private companies. Private companies can assume the role as mediators between public

organisations. However, the use of PPCs should be considered carefully, Cordella and Willcocks (2010) observe intense ICT outsourcing activities within the UK. In their research, they question the perceived efficiency and effectiveness benefits. Retrospectively, in-sourcing and building up internal capacities could have been more efficient than the use of PPCs. While this might be true, both the scholars and the interviewees do not have the confidence in the public sector to fulfil this. While especially some public sector employees hope for more internal resources, the reality seems to be far away from this.

Contrary to existing literature, are financing issues not perceived as a main driver per se (see Hodge & Greve 2017). This might relate to the urgency of improving eGovernment topics, the resulting political, and therefore monetary support. Rather important is the flexibility of when and for how long to hire employees perceived as an important cost factor by the interviewees. This can be related back to the civil servant structure and the lifetime employment. Moreover, extensively training of public sector employees would be needed if the public administrations wanted them to keep up with the pace of technology. Therefore, PPCs are providing the opportunity to provide staff as needed to the public sector, with the corresponding necessary skills.

Adding on this, interviewees are convinced that the private sector can provide more up to date solutions. This might the case as private companies are often developing new technologies. Nevertheless, this might be strongly connected to external pressure as well. The perceived society's desire to use technologies and services as in the private sector drives public administrations to act. Still, the question remains if the public sector can meet the expectations. A mismatch might result in dissatisfied citizens. Eventually, of significance is the country's attractiveness for private sector companies, which declines with ineffective governmental services (see Marschollek and Beck 2012). As the third biggest economy in the world, it is integral to push further into the development of eGovernment efforts. Hereby, the incorporation of private sector ideas might serve as a major advantage. When referring back to the case of Estonia, the collaboration with the private sector is crucial for the development of eGovernment efforts (see Goede 2019).

With the adoption of the OAA, legal pressure to drive eGovernment efforts is established. This pressure also appears to reflect on public administrations. Although, legal pressure might be an acceleration mechanism, public administration might get stuck in the objective to be legally compliant. This then might prevent to set up a holistic, through-thought implementation plan which appeared to be a barrier for one interviewee. In relation to this, the combination of various external pressure elements might lead to projects being rushed, not taking care of long-term sustainability, such as the knowledge

building of the public sector. Moreover, the mentioned political pressure is crucial to start eGovernment projects as seen with the OAA.

6.1.3 Barriers

The barriers in eGovernment projects in PPCs are a mix of barriers for eGovernment and challenges of PPCs. Especially the results concerning the lack of contract- and project management skills, the challenges within procurement and legal compliance as well as the political challenges are highlighted.

Callens et al. (2024) perceive contract management to be one of the important aspects to ensure the basic set-up of PPCs. In their research, all of their observed cases promoted contracts. The major reasons mentioned in the research are: "to clarify interdependencies and partner's role, to bring additional knowledge into the partnership, and to avoid conflict by clarifying accountability relationship" (p. 155). All of these functions appear to be integral in order to avoid PPCs being more complex than needed or even fail. Yet, interviewees perceived this stage to be difficult and complex. The complexity of contract management is observed by various studies (see Leite and Ingstrup 2022). A proposition of an interviewee refers to include legal expertise right at the beginning of a collaboration to support the establishment of the contract and secure a base for both of the partners. The importance and success of the integration of external legal expertise can be seen in eHealth (Callens et al. 2024). While setting up the contract, various influences need to be considered, among other the knowledge of the public sector to know what they demand as well as potential sanction payments. The initial one is mentioned various times by the interviewees. This goes in line with the perceived lack of knowledge of employee: how are employees supposed to know what their public administration needs, if they are not having IT knowledge? This description of the specifics needs to be adjusted, however, as mentioned in the perception results, new forms of PPCs are emerging. The latter one, potential sanctions, are a necessary element of contract management in case of poor performance (Brown and Potoski 2004). This would also enable public sector managers to stand up for their rights as customers, as the inability of it is criticised during the interviews. These difficulties in contract management correlate negatively with PPCs (Hefetz and Warner 2012). The recognised difficulties in research as well as in this study can be addressed by having professional managers in public administrations as such lead to less difficulties in contract management (Hefetz and Warner 2012). By having the expertise in the public administration, local governments are more involved in collaboration efforts of any kind.

The complexity of public procurements is one of the major factors hindering PPCs, according to the interviewees. While PPCs are perceived as important, the knowledge

about procurements within the public sector appears to be missing. This is echoed in current research by Eßig et al. (2021). Their findings reveal that public employees need to enhance their skills in this matter as well as utilise them. However, they also consider training not to be enough and call for public procurement to be accepted as a profession, as they have seen in other countries. During the interviews, this is reflected in the need for special procurement lawyers. Various adjustments to procurement law are made by governments to make innovation in public organisations and administrations more easily, such as the experimentation clause mentioned by multiple interviewees. The city of Hamburg is a pioneer with this. With this clause, projects with a value below 100.000 € do not need to go through procurement processes. While this accelerates PPC, to date only one public organisation in Hamburg is allowed to use this (Senatskanzlei Hamburg 2024). Therefore, open questions such as the adoption for public administrations themselves remain. Next to this, federal states are already trying to decrease hurdles by accelerating procurements and introducing reusable licence models (Engel 2021). In particular, the pace of procurements is regarded as a barrier by the interviewees. Therefore, accelerating the pace might be a beneficial step. Especially one group of private partners has difficulties with public procurements: SMEs. These difficulties for SMEs are not new; various scholars observe this (see Akenroye et al. 2020; Glas and Eßig 2018). According to their research, SMEs can benefit from lower project volumes as well as more competitive procurements (Glas and Eßig 2018). While more competitive procurements seem to be surprising, private sector interviewees pointed out the partly questionable practices of procurement. In turn, the competitiveness is important for the government to avoid market failures as described by Brown and Potoski (2004).

However, procurement law is not the only legal barrier mentioned by the interviewees. Opposing as well as intertwined laws are also perceived as a barrier by interviewees. With the OAA 2.0, the federal government aimed for exceptions in legislative requirements, such as the abolishment of the paper signature requirement to make digital services possible (Mergel 2021). However, as stated in section 3.2, lower-level politics did not agree. This reflects on the interconnection of legal and political barriers.

According to one interviewee, the adoption of new technologies that are available on the market are hindered by the lack of corresponding regulation, leading to the involuntary non-use of PPCs. Politics cannot react as fast to technological changes as hoped for by at least some public administrations. The influence of politics in ICT adoption is also observed by various scholars (see Goyal et al. 2021; Marchant et al. 2011). The adoption and the adjustments of laws are not as rapidly happening as the technological change. The increasing speed of technological change makes this even more important in the future. Public administrations might fall back even more, while private sector entities need to

take more risks when collaborating with the public sector. While some might wish for a more rapid adoption of the regulatory basis, the downsides of fast adjustments need to be taken into consideration. As emerging technologies are gaining in complexity, uncertainties occur. Regulatory bodies might lack the understanding for such, needing to incorporate expertise, which in turn needs longer processes. However, this understanding is necessary due to the consequences that the implementation of technologies such as AI can have on the public sector (see Valle-Cruz et al. 2019).

Especially GDPR issues are mentioned by the public sector as private, usually non-EU companies, are pushed back from the German eGovernment market. Most probably, this will gain in importance with the trend towards Cloud-computing, which is often connected to Software-as-a-service (SaaS) solutions. It needs to be seen if companies are willing to adapt their models towards legislative requirements or if public administrations try to find solutions within a grey area of legislation, such as stated by one of the interviewees. Besides this, interviewee discussed political challenges such as the influences of political cycles into PPCs. While the local levels are usually smaller, political changes can probably overview the ongoing projects. For this, it might be worth it to look into the establishment of a national strategy, decided across political parties. By doing so, political cycles could be ignored, leading to an enhanced project flow in PPCs.

6.1.4 Ambivalent influences

While the beforementioned barriers and drivers can be separated, some of the mentioned influences of PPCs in eGovernment projects tend to be rather ambivalent, acting as a driver as well as a barrier. This concerns three of the factors: organisational factors are mentioned as the most crucial one, as well as perceptions of PPCs and the market conditions on the private market.

Starting with the most crucial one, organisational factors. By attempting to answer RQ2, the interviewees see this as one of the main influences why PPCs need to be used; yet they are also the reason why PPCs become difficult or might even fail. Especially the differences of both sectors are viewed as ambivalent. On the one hand, the divergences and in turn the combination of various skills can help to close the gaps in the sectors. During the interviews, especially the public sector is considered to profit from it: they civil servants bring in specific knowledge of the public administration, while the private sector delivers expertise. Particularly in project execution, the private sector is viewed to function as a kind of role model. Private companies can bring in more agile and flexible working and project execution structures, diverging away from the "waterfall based" project management approach. Nevertheless, studies suppose that agile project management structures are not always the best solution; most important is the correct

choice of project management styles. With growing complexity of a project, more agile approaches seem to be beneficial to local authorities. Further, the implementation of project management at all is a crucial factor as well (Mitchell and Mitchell 2014). As eGovernment project are viewed as rather complex to the interviewees, agile and flexible working structures might lead to success. Public administrations might benefit from a learning-by-doing effect while executing the projects. While private companies can additionally help to bring in new impulses, according to the interviewees, private players should only be taken as a role model up to a certain extent. It may be oversimplified to assume that private sector practices can be easily transferred to the public sector. Local administrations work within a different environment with other rules. Therefore, the private sector might only act as an inspiration, needing to keep in mind public sector specifics. Although the private sector is partly seen as a role model, multiple interviewees doubted that the public sector is even supposed to execute eGovernment projects on its own. In their opinion, the government should focus on its core function. To them, private companies are more suitable to digitalise the public administration. While this seems understandable, questions arise. Is the public sector able to implement eGovernment on their own? Are the dependencies on the private sector too high? As public administrations need to serve the citizens, the diverging structures and objectives of both sectors might lead to problems.

The differences of the organisational and cultural structures are recognised as a barrier for setting up a collaboration and a successful ending. The comparison of a public administration employees which sees local administrations as a tanker versus the start up as a speedboat, illustrates this issue. Not solely the interviewees perceived the public sector to slow down projects efforts, this is also echoed by other scholars (see Marschollek and Beck 2012). Especially institutional requirements seem to be a reason for this. The severe differences can be unhealthy for the project's environment and might lead to insufficient collaboration. Various scholars refer this back to the differences in institutional logics, which occurs as a barrier in PPCs (see Leite and Ingstrup 2022; Quélin et al. 2017). Leite and Ingstrup (2022) observe that missing convergence of institutional logic leads to a misalignment in goals as well as in practice. During later project stages, the misaligned logics could be resolved due to communication and accommodation. While this is not mentioned during the interviews, more emphasis on these divergences and the alignment of such should be given from the start of PPCs. Another interesting aspect observed by Leite and Ingstrup (2022), are the characteristics of the individuals, that try to converge the divergences in institutional logics. These employees had an understanding for multiple institutional logics and appeared in a central role within the collaboration. The research is in line with this research's efforts. Referring back, some interviewees perceive work experience in both sectors as helpful during PPCs. They bring

varying institutional logics into the project, leading to the mutual understanding that is perceived necessary by multiple interviewees. The establishment of a mutual understanding as a crucial project influence is in line with various academic observations (Marschollek and Beck 2012; Leite and Ingstrup 2022).

The existing structures within public administrations make the implementation of both PPCs and eGovernment hard; the combination appears to intensify the problems. Organisational challenges are as well mentioned by the interviewees, such as hierarchical structures and long communication cycles. To solve this, Mergel (2019) pledges for a change in administrative culture as a bottom-up approach. While this seems tempting, it is not in line with the results of this research and to date, achieving this might not be possible. Even various scholars stress the importance of higher-level employees in changing organisational culture. According to them, it's the responsibility of higher-level employees to motivate and include all employees in especially eGovernment projects (Stich and Schwiertz 2021). As eGovernment solutions need to be implemented in an accelerated way, the cultural change rather seems to be a long-term strategic solution. Moreover, public administration's thinking in silo structures is observed for a long time in literature (see Layne and Lee 2001). Therefore, a change in civil servants' mindset might be necessary to integrate eGovernment application efficiently. This in turn may lead to enhanced collaboration efforts as problems related to this could be solved.

This mindset of including a private entity in public affairs is also influenced by perceptions. During the interviews, both negative and positive ones are mentioned. This research suggests that perceptions play a role in collaboration efforts. As perceptions are not as frequently mentioned as expected, a hypothesis could be developed: with the importance of eGovernment and its evolvement in the direction to be a necessity, public administrations cannot conquer this on their own. In turn, alternative choices such as the use of PPCs occur and might be perceived as one of the few ways to achieve the objectives. Therefore, perceptions could lose in importance as some of the drivers are increasingly integral to public administrations. However, this needs to be observed in the future.

Moreover, the condition of the private market is a factor influencing PPCs. Although not being mentioned by all interviewees, the importance of regional private entities seems to be rudimentary. The benefits of closely located companies seem to connect both partners and have effects on the success of the collaboration. On the contrary, obscure market conditions are not solely a barrier for the interviewees, it is also observed by studies looking at other public sector authorities (Brown and Potoski 2004). During the interviews, interviewees mentioned difficulties of the public sector to gain a market

overview and screen the private entities accordingly. However, current research stress for the need of public managers to be able to observe the market and gain information thorough their networks (Eßig et al. 2021).

6.2   Theoretical implications

This research contributes to the theoretical sphere of PPCs in eGovernment projects by evaluating their perceptions, drivers, and barriers. These provide valuable insights on multiple theoretical topics.

First, the research compliments current research efforts on PPCs. Especially in terms of the conceptualisation of it. As stated in the theoretical foundation, this research illustrates a wide interpretation of PPCs. While the contract form is often similar, its application areas can take different forms, especially in the eGovernment context. Such insights can provide information to specify the currently existing definitions.

Second, the research delivers insights for both literature strings – public-private-collaboration and eGovernment. The mentioned elements support existing literature and further add details and perceptions. Especially research on PPC is complimented. With the practical understanding overlapping the theoretical one, it provides further validity to current research. However, some of important elements in academic literature seem to lose in importance. eGovernment research can benefit from the often-neglected importance of the inclusion of private partners. Both literature strings can therefore benefit of the insights of this research.

Third, by combining two already well researched areas, this research shows the relevance of the combination of the two concepts. It presents a deep dive into various influencing factors of PPCs in eGovernment. Hereby, especially the characteristics of quick technological advancements and expertise are mentioned. Further, it provides insights on the combination of the drivers and barriers. It reveals the complexity and interconnection of the topics; it demonstrated in particular the dependencies of both sectors. Moreover, various overlaps can be observed within the drivers and barriers as illustrated in section 6.1.4. As research on PPCs exist extensively within the infrastructure sector, research within other sectors is still rare.

This leads to the fourth contribution to theory. This research provides evidence from the German context, delivering country specific insights. With the importance of Germany as an economic area, its future developments need to be looked at. For this, the research provides insights in the sphere of the digitalisation of government as well as in the

collaboration among the two stakeholders. It presents the current perception of PPCs with its various options and gives therefore an overview of the current, to date standpoints.

Fifth, as this research is based on bi-sectoral qualitative data, it issues an understanding of both partners, private and public entities. It bundles urgent themes, without neglecting important issues for any of the perspectives. While oftentimes only one perspective is looked at, this research might be valuable to understand that stakeholder perceptions can be similar, while also experiencing similar difficulties.

6.3 Practical implications

As this explorative research studies a practical topic, its practical implications are manifold. PPCs are necessary and employed in an everyday setting. However, their barriers seem to convey fear. Due to the research's focus on both the public and private sector, it discloses aspects that might be interesting for the respective sector. The practical implications of this research can enhance PPCs and can be divided into three levels: the micro, meso and macro level.

To begin with, this research can contribute to enhance collaborations on a micro level. Hereby, individuals working in PPC are targeted. Within the public sector, this research might help to raise awareness for the importance of PPCs and try to increase the understanding for private partners. Moreover, civil servants can use this research to be aware of the potential barriers beforehand. This research provides with its barriers certain training topics, such as contract- and project management in PPCs as well as the handling of public procurements. In particular these barriers could partly be solved on the micro level. However, the results of this research might also be interesting for individuals in the private sector. Especially project leaders working within PPCs can be enriched and made conscious about public sector needs and its characteristics. As most of the private sector employees are specialised in the public sector, the results might raise awareness which can be transferred to project planning, particularly knowing that the research encompasses both sides.

On the meso level, this research targets public organisations on all three governmental levels. By enhancing the knowledge of the public sector, achieving a balance between maintaining public accountability and embracing flexibility is crucial. Public administrations must focus on developing internal capacities while strategically leveraging private sector partnerships to drive digitalisation and innovation. This research reveals the importance to end the vicious cycles public administrations encounter. Hereby, the beforementioned facilitation workshops might be a suitable option. The research might also support the private sector to get to know the fears and considerations

of the public sector. Hereby, new focuses can be set, and further business models may be developed. This dual approach can ensure a balanced and sustainable path to a German eGovernment.

Ultimately, it became obvious that drivers and barriers cannot always be separated as wished for. This discloses the complexity in PPCs as well as in possible enhancement efforts towards a better use and functioning of PPCs. The combination of eGovernment and PPCs delivers insights into both spheres and sets areas to focus on. While talking about PPC in eGovernment projects, interviewees often drifted away towards the barriers of implementing eGovernment alone. One conclusion of this might be that local public administrations got used to the collaboration with private partners. Both sectors show such tendencies, which might imply that the barriers for eGovernment are more significant for the interviewees than the barriers for PPC, yet they still exist. This research therefore emphasises on the long-called reform of the German eGovernment strategy towards a holistic, long-term approach as well as the adjustment of relevant regulation. Although not inherently essential for PPCs, the absence of the former might prevent collaborations and with that the advancements in eGovernment. The strategy should be formulated by a diverse group of individuals; with expertise in public administration, spanning all three levels of government, as well as politics, field specialists, businesses, and end-users. It is crucial that this group operates independently from political cycles. As private companies have been perceived as a necessity, the inclusion of them is strategically important. This opportunity could then be used to tackle the barriers and simplify some of the often-occurring problems, such as the legal requirements and the involvement of politics which causes fluctuation.

7   Conclusion

In conclusion, this research addresses a long existing gap in current research. By combing the two research areas of eGovernment and PPC in the context of Germany, more about its specific context is revealed. With the inclusion of a bi-sectoral perspective, the research yields to gain insights in collaborative dynamics and their influencing factors. The importance and need of PPCs in eGovernment projects in Germany are immense. Yet, collaboration is hindered by multiple barriers.

The insights of the 15 interviews, with eight individuals from the private sector and seven from German cities, deliver various views on the topics. First, the perceptions of PPCs are mainly positive: Such collaborations are seen as a driver for eGovernment. They function mostly well. On the contrary, interviewees are concerned about possible dependencies of the public sector from the private sector. For instance, the occurrence of vicious cycles is mentioned as a transfer of know-how from public to private collaborators is currently still perceived as mostly non-existent. Although some cities are already trying to build up internal knowledge, still, PPCs are perceived to play an integral role in the future.

Further, this research shows that the drivers and barriers are much more intertwined than first assumed. Organisational and cultural elements of the public sector are perceived as a barrier as well as a driver due to its characteristics. While the structures of the public sector make PPCs necessary, is it also making collaboration efforts harder than needed due to long communication processes and top-down hierarchies. Similarly, the differences in both organisations are leading to ambivalent influences. The public sector can gain experience and new ways of working from the private sector. Yet, strong divergences can lead to challenges in collaborative efforts. Moreover, perceptions and market conditions can either function as drivers or barriers. Efficiency gains through private companies, technological advancements and external pressure are mentioned as drivers. Additional barriers include a lack of management skills, in particular in contract- and project management, the complexity and quantity of existing laws as well as political challenges.

Practical implications to enhance and strengthen PPCs can be derived from this research. Practitioners can gain an understanding of the influences and generate a mutual understanding to minimise barriers as much as possible. The results might be thought-provoking for managers of such collaborations. Theoretical implications relate mainly to the concept of PPCs, where the findings provide further insights into this topic.

This research reveals the reliance of the public sector on the private sector in eGovernment projects in Germany. With the changes in the external environment as well as political pressure coming from the EU-level, the digitalisation of the public administration and therefore the need to collaborate are gaining in significance. If Germany wants to offer the benefits that come along with eGovernment to its citizens, such as Estonia is doing, practitioners should rethink the research results. This research is solely at the initial stage of what needs to be researched in the future. Although multiple elements are revealed during this research, one thing is for sure: more than ever before, the need for public-private-collaboration is as pronounced as to date.

7.1   Limitations

This research allows to gain valuable insights into the topic of PPCs in eGovernment projects in Germany. Yet, certain limitations are important to note that are associated with this research. Although the methodological approach is widely accepted in academia, it shows constraints. Like the critiques on qualitative studies point out, expert interviews are prone to be subjective and biased. Although this depends on the interviewee, the analysis of the data needs to be conducted carefully and critically. Each interviewee has a limited scope on the topic as they incorporate individual experiences and perceptions. This might lead to various, sometimes contradicting, opinions. By including solely one interviewee per organisation, the question of how representative a single individual can be may arise. Therefore, it is necessary to keep an interviewee's background in mind in order to form a full understanding of the collected data. Generalisation efforts are also limited due to the number of interviewees and the explorative study design.

Moreover, the methodological approach by searching for interviewees is connected to a sampling bias. Although various cities were contacted, solely cities which use PPCs were interviewed. The same problem occurred with private companies, concluding that the study design suffers from a homogenous group of perceptions. This exhibits a bias towards to need to use PPCs in eGovernment projects. This is especially integral for the perception and barrier section as some integral differences might be overseen.

Furthermore, thematic and contextual limitations arise. In particular, the scope of both concepts is vast, which might lead to difficulties in the theoretical concept. While the results delivered valuable insights, the theory behind it remains vague. This might lead to differences in results as PPCs might be understood differently. Thus, the research is limited in terms of the connection to existing or future research. The German-specific results limit the possibility of generalisation. This is especially the case as public sectors vary tremendously across countries, even if countries appear to have similarities otherwise. Likewise, the specifics on eGovernment and PPC are differing. The results

might be of valuable insights for other domains PPCs operate in, yet they might not be entirely transferrable.

In addition, this research is conducted on a local level, in particular smaller big cities. It needs to be taken into consideration that local divergences are crucial in Germany. Hence, the results cannot be applied universally to all German local levels neither to all German cities. Despite these limitations, this research brings potential for future research.

7.2   Future Research

This thesis addresses the research gap regarding PPC in eGovernment projects in Germany, presenting various elements of interest. Consequently, the potential of this topic remains immense. On a theoretical level, future research needs to be done on PPC as a concept. The research demonstrated that the concept is not widely recognised, while it is perceived in a similar way. Thus, additional research might enhance the richness of detail and the level of information on this topic.

While the sample of interviewees and their experiences is homogenous, other scholar could examine this topic by focusing on eGovernment PPC projects. By conducting a case study, perceptions, drivers, and barriers can be observed on a deeper level, with its motives and interrelations. This would allow to dive further into specific elements, questioning the outcomes on a micro level. Potentially, other main drivers and barriers can be found, leading to additional insights. Alternatively, a survey among all German cities or municipalities can derive more heterogenous insights with the opportunity to engage with public administrations that are not utilising PPCs.

Hence, the insights of the perceptions as well as the drivers and barriers deliver more room for research. As this research provides a base, future research can delve into the single aspects, enabling an in-depth exploration. The explored perceptions show a relationship which might be worth looking at: the need vs dependency relation. Depending on the outcome, more concrete practical implications can be developed.

Since both concepts are relevant beyond a local scale, the geographical and organisational scope of this research could be broadened. For the latter aspect, the study could be replicated with an expanded sampling, including more organisations, or involving multiple study participants from single organisations. Geographically, the study could be executed in other countries, allowing to compare the role of the private sector in eGovernment. All of this would provide profound insights on resemblances as well as differences in contexts.

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Appendix

A   Interview guide

1.	**Einführung**	**Introduction**
	Könnten Sie bitte kurz Ihren Arbeitsalltag und Ihre Rolle in der Organisation beschreiben?	Could you please briefly describe your day-to-day work and your role in the organisation?
	Was verstehen Sie unter Public-Private-Collaborations (PPCs)?	What do you understand by public-private-collaboration (PPCs)?
	Haben Sie selbst an einer PPC mitgewirkt? - Falls ja, können Sie kurz darüber berichten? - Falls nein, können Sie kurz erläutern warum nicht?	Have you been involved in a PPC yourself? - If yes, can you briefly comment on it? - If not, can you briefly explain why not?

2.	**Wahrnehmung von PPCs in der Verwaltungsdigitalisierung**	**Perception of PPCs in eGovernment projects in public administration**
	Welche Rolle spielen PPCs/private Unternehmen in der deutschen Verwaltungsdigitalisierung?	What role do PPCs/private companies play in eGovernment projects in Germany?
	Welchen Beitrag können private Unternehmen Ihrer Ansicht nach bei der Verwaltungsdigitalisierung leisten?	What contribution do you think private companies can make to the digitalisation of public administration?
	Funktioniert die Einbindung privater Akteure Ihrer Ansicht nach? Was sind die ausschlaggebenden Faktoren hierbei? - Was bräuchte es um private Akteure erfolgreicher einzubinden?	In your opinion, does the involvement of private actors work? What are the decisive factors? - What would it take to involve private actors more successfully?

3.	**Nutzung von PPCs in der Verwaltungsdigitalisierung**	**Use of PPCs in eGovernment projects in public administration**
	Welche Formen von PPCs werden mehrheitlich zur Verwaltungsdigitalisierung verwendet?	Which forms of PPCs are mainly used for eGovernment projects?
	Welche Formen von PPCs sind hierbei besonders erfolgreich?	Which forms of PPCs are particularly successful?
	Beobachten Sie eine Tendenz zur Veränderung in der Zusammenarbeit von öffentlichen und privaten Akteuren?	Have you observed a trend towards a change in cooperation between public and private actors?
	Welche Besonderheiten gibt es bei der Nutzung von PPCs in der Verwaltungsdigitalisierung?	What are the specifics on using PPCs in eGovernment projects?

4.	**Treiber**	**Drivers**
	Welche Faktoren haben die Bildung von PPCs mit Bezug zur Verwaltungsdigitalisierung positiv beeinflusst? - Falls in PPCs involviert: Glauben Sie, dass dies nur auf ihr Projekt zutrifft oder auch generalisiert werden kann?	What factors have positively influenced the formation of PPCs related to administrative digitalisation? - If involved in PPCs: Do you believe that this applies only to your project, or can it also be generalised?
	Welche Faktoren sind wichtig, um den Erfolg von PPCs sicherzustellen?	Which factors are important to ensure the success of PPCs?

5.	Barrieren	Barriers
	Welche Barrieren sehen Sie bei der Bildung von PPCs im Bezug zur Verwaltungsdigitalisierung?	What barriers do you see in the formation of PPCs in relation to eGovernment?
	Welche Barrieren sehen Sie bei der Nutzung von PPCs?	What barriers do you see in the use of PPCs?
	Welche Phase dieser Kollaboration ist, Ihrer Empfindung nach, die Schwierigste/Anspruchsvollste?	In your opinion, which phase of this collaboration is the most difficult/challenging?
	Welche Maßnahmen oder auch Strategien können helfen, diese Barrieren zu überwinden?	What measures or strategies can help to overcome these barriers?

6.	Ausblick und Abschluss	Outlook and closing
	Wie sehen Sie die Rolle von PPCs in der Verwaltungsdigitalisierung in Zukunft in Deutschland? - Werden diese mehr oder weniger genutzt werden? - Sollten diese mehr oder weniger genutzt werden?	How do you see the role of PPCs in eGovernment in Germany in the future? - Will they be used more or less? - Should they be used more or less?
	Was müsste, Ihrer Meinung nach, geändert werden, um PPCs ansprechender zu gestalten?	What do you think needs to be changed to make PPCs more appealing?
	Gibt es aus Ihrer Sicht noch Aspekte oder Anmerkungen, die wir besprechen sollten?	In your opinion, are there any other aspects or comments that we should discuss?