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Scoping GovTech dynamics in the EU

interoperable europe

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Foreword

Today's societal and political challenges – from global pandemics and the digital transformation of the economy to demographic shifts and climate change – put extra pressure on governments to act innovatively and to do so at an adequate speed. The challenge here is that democratic governments, in Europe and beyond, are not set up to act innovatively or swiftly. The Weberian bureaucratic model was created to ensure maximum government transparency and reliability towards citizens and is based on principles such as hierarchical decision-making and formalised procedures. These principles do not mix particularly well with agility, creativity, and experimentation as crucial requirements for innovation.

This means that one of the biggest challenges for governments today is to reconcile the principles of good, reliable public management (bureaucracy) with the need for greater agility and creativity as critical ingredients for public innovation. And one very promising approach to this challenge is greater cooperation between governments and those much better equipped to produce innovation: the private sector, specifically young and technology-driven companies that have out-of-the-box and disruptive thinking in their DNA.

Increased cooperation with tech companies and start-ups, also known as GovTech, has gained significantly in popularity over the past few years. Despite its potential, however, GovTech cooperation is still far from widespread or standard for government agencies when faced with pressure for innovative solutions. Why? The reasons are manifold. Germany's IT Planning Council, the country's central body for the digitalisation of the administrative system, analysed these reasons in a working group last year. It found that some of the important obstacles to GovTech cooperation lie in public procurement structures, as extensively addressed and explained in the present report.

Beyond procurement issues, however, "lack of awareness", "innovation-inhibiting action", and "different mind-sets" were also named as critical hurdles to greater cooperation between governments and highly innovative non-public entities in the interest of GovTech innovation. These are cultural and psychological barriers that cannot be addressed by laws, legal reforms and guidelines. Overcoming these "soft" barriers requires something else: breaking down sectoral silos and overcoming the traditional mutual scepticism between public and private sector actors. It requires building trust and practising new methods of working and collaboration.

This is why we founded the GovTech Campus Germany as a physical and virtual space where new trust between government and private sector actors can be fostered; where new methods of cross-sectoral co-ideation, co-creation, and co-learning can be tested, practised and refined; and where GovTech companies and governments can stop eyeing each other with suspicion and start collaborating and innovating on an equal footing.

For similar reasons, the new European GovTech innovation platform or innovation hub will open in 2022 – and will, I hope, address two additional challenges to a flourishing GovTech ecosystem. First, I hope it will add a European perspective, which has been largely absent to date, on government innovation and cross-sectoral GovTech collaboration (tackling the question of why national borders remain so present when it comes to government innovation). Second, I hope that the accelerator will produce strong examples of good practices in GovTech cooperation to underscore the potential that this approach to innovation holds. Concrete results are the best way to remedy scepticism and forge much-needed trust in GovTech as an unusual yet promising new approach to work and innovation.

Dr. Markus Richter

State Secretary at the Federal Ministry of the Interior and Community and Federal Government Commissioner for Information Technology

Foreword

The experience of the Covid-19 pandemic has emphasised the importance of a well-functioning digital public administration. It has also shown us the reality of where we currently stand.

First, despite significant progress, fully digital public services are not yet a reality for many EU citizens and they do not fully embrace the potential offered by emerging digital technologies. Covid has forced urgent action and drastic improvements, sometimes unlocking longstanding administrative hurdles. However the road is still long to achieve a full digital transformation of government. Second, the pandemic has also put a spotlight on the dependencies we have with a limited set of major providers. To support EU Digital Sovereignty in an open and free market we need to ensure a level playing field between companies bidding for public contracts to provide digital products and services. Third, the pandemic has also brought to light the urgent need to experiment rapidly, move fast, and innovate continuously to deliver user-centric public services.

One of the answers put forward to address these complex challenges is GovTech – the cooperation of public sector organisations with innovative start-ups and SMEs to develop new digital solutions. While more and more governments are starting to engage with GovTech, there remain significant challenges related to the complexity of our procurement rules, the dynamics of the GovTech market in the EU, as well as cultural factors.

The European Commission is supporting governments at local, regional, and central level to make use of the opportunities offered by GovTech. Under the Digital Europe Programme, we are launching a European GovTech Incubator to especially support cross-border collaboration. One crucial ingredient for supporting the European GovTech ecosystem across borders is interoperability, which allows start-ups to sell their products and services more easily to different governments, and therefore grow and scale-up in a European Single Market. We are currently revamping the EU public sector Interoperability policy to make Interoperable Europe a reality.

To support these developments at EU level, we also need to ensure that we have the right evidence about what works, and what does not, and which trends we need to respond to. Therefore, the European Commission will provide scientific evidence for policy on digital transformation of government in general and GovTech in particular. This report, and its twin report on guidelines for establishing GovTech programmes, are a first step in this direction.

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Abstract

This report provides background information on GovTech dynamics in the EU. It starts by giving an overview of the current state of public procurement for innovation (PPI). The report highlights the rather uniform definitions of PPI, its purpose, existing barriers and obstacles, and explains different types of procurement models and their processes. Based on empirical evidence from scoping interviews with start-ups, founders and GovTech programmes, the report then reflects on how the existing schemes apply to recently planned GovTech initiatives, shows the reasons why governments might be investing in GovTech, and highlights a series of recommendations for countries in the process of implementing their own GovTech initiatives. The report is part of two twin reports on GovTech developed by the JRC with support from the ISA^2 programme.

Executive summary

Policy context

This report is published in the context of Europe's Digital Decade, as well as the post-COVID-19 recovery plan NextGenerationEU. Functionally, it stems from the European Commission's ISA^2 programme which focuses on finding interoperability solutions for public administrations, businesses, and citizens. It aims to contribute to the implementation of the European GovTech Incubator, developed under the Digital Europe Programme, that will enable cross-border and cross-domain experimentation. Finally, it answers to the growing domestic interest in GovTech from governments at central, regional, and local levels.

Key conclusions

The report argues that in order to make use of the potential of GovTech, one must understand and innovate procurement practices. Furthermore, it finds that the GovTech market in the EU carries dynamics that hinder innovation by posing unique challenges for public and private sector actors. Governments are trying to address these challenges by building GovTech ecosystems, creating innovation knowledge, fostering and implementing innovation, and creating market standards. Dedicated GovTech programmes are one way to organise these different lines of action.

Related and future JRC work

This report is part of a larger research effort at the European Commission's Joint Research Centre on innovation of public services, new governance models, emerging technologies, and innovation in society and economy. In this context, GovTech is a crucial piece of the puzzle to understanding how we can improve public services with the help of digital technologies. This report is one of two twin reports on GovTech in the EU published at the beginning of 2022.

Quick guide

After the introduction (Section 1) and an overview of the research methodology underlying this report (Section 2), the report presents some crucial background knowledge on public procurement of innovation (Section 3). This is followed by the main part of the report on understanding GovTech and its dynamics in the EU (Section 4). Lastly, the report provides policy and practice recommendations based on the discussions in previous sections (Section 5).

1 Introduction

Governments in the EU, at the local, regional, and central level, as well as the EU's supranational institutions, are facing a myriad of complex interrelated challenges. Demographic change, technological change, climate change, tight budgets and acute crises like the economic and financial crisis starting in 2008 and the Covid pandemic that started in 2020. These circumstances require governments to act and adapt even quicker than during non-crises times. Digital technologies can help with that, by making governments more efficient, more effective, and increase the value they provide to the public.

However, buying off the shelf digital solutions from established vendors is not always sufficient to address the specific challenges governments are facing. Therefore, many governments are starting to look into GovTech. This term refers to the use of emerging technologies and digital products and services by government from start-ups and SMEs - instead of relying on large system integrators. There are many - oftentimes competing - definitions of the term GovTech. Despite their differences, most definitions share the following common three elements:

1. **the public sector engages with start-ups and SMEs to procure innovative technology solutions,**
2. **for the provision of tech-based products and services,**
3. **in order to innovate and improve public services.**

This emerging field is still developing and has received increased attention in the past years in a market space that is highly regulated through public procurement rules and regulations, and dominated by large companies. To allow for the type of innovation that the market has not yet provided, GovTech is still an underexplored area. Nevertheless, governments are setting up GovTech incubators, accelerators, labs, campuses and other initiatives to which they invite different stakeholders to participate in order to experiment, gain first-hand experiences, and drive innovation in the public sector.[1] Similar to innovation labs or digitalisation labs, these initiatives still have to prove themselves and the existing rules and regulations might have to be adapted to move from the initial experimentation phase into standard government practices.

Box: **Selected GovTech programmes in the EU**

GovTech is a dynamic and still emerging field. Therefore, any overview faces the risk of being outdated immediately. Therefore, the programmes mentioned below are just a snapshot to show the diversity of programmes at the time of writing.

National examples of GovTech programmes include: GovTech Programme (Denmark), Achats Publics Innovants (France), GovTech Lab (Lithuania), GovTech Lab (Luxembourg), GovTech Polska (Poland), GovTech Campus (Germany).

This report undertakes an exploration into the emerging field of GovTech in Europe and analyses some of its underlying dynamics. The aim is to come to a better understanding of how governments can make use of GovTech to be more innovative and what some of the challenges are. The report does so by first providing a brief overview of the methodologies used in the underlying research (Section 2). It then gives an overview of the current state of public procurement of innovation (Section 3), before discussing GovTech dynamics in the EU (Section 4). Finally, the report concludes with recommendations for policy and practice (Section 5).

1. for a selective overview, see, for example

2 Brief overview of the methodology underlying the findings of this technical report

Before getting into the main subject of the report, this section briefly introduces the methodology of the research that underlies this report. The report is based on several independent research steps conducted by the authors in 2021. Those steps include:

- **A systematic review of academic literature on public procurement of technology innovations;**
- **An additional review of grey literature on PPI, such as consulting reports and blog posts by experts in the fields;**
- **Qualitative interviews with GovTech experts, start-ups and SMEs, non-traditional actors, and managers of government run programmes to support the GovTech ecosystem.**

In preparation for the task, the research team has developed a shared understanding of the assignment, reviewed the provided documentations from a first GovTech workshop (October 2020), including additional presentations and then systematically reviewed the current academic literature on public procurement of innovation.

In order to conduct the literature review, we have chosen a systematic approach following the PRISMA scheme (Moher, Liberati, Tetzlaff, Altman, & Group, 2009). This is a form of literature review methodology that was developed in order to apply a rigorous review scheme to medical studies in order to produce a meta-analysis of treatments of patients. More and more, the public administration field has adopted this procedure in order to bring clarity to crowded fields of research or to systematize the emergent, but potentially divergent literatures in a field (see, for example, Voorberg, Bekkers, & Tummers, 2015).

The PRISMA scheme follows a step-wise approach that outlines in a transparent manner how the research was conducted and makes each step replicable for other researchers. The goal is to ensure a justification for future research by outlining specifically what was already published up until the point of the review and to clearly outline potential gaps in the literature. The value of this scheme lies in its iterative approach and its clear review protocol that outlines inclusion and exclusion criteria and shows in every step what types of sources were included or excluded for the final review.

In the first step, the eligibility criteria are identified. Articles were included that are of both empirical and conceptual nature and were published in peer-reviewed journals. The language requirement was English and articles had to have a clear focus on the public sector. There was initially no exclusion date set. It however became clear during the search that the earliest articles were identifiable in 2000 and the most recent one was published in 2021. During the screening process, the titles and abstracts of the articles were reviewed and subsequently duplicates and articles that did not focus on the public sector or public innovation procurement were excluded.

Based on the literature review, the research team developed a joint interview outline that focused generally on topic areas and was purposely designed as open-ended to allow for enough leeway to address all types of pre-selected experts (Bogner, Littig, & Menz, 2009; Newcomer, Hatry, & Wholey, 2015; Weller et al., 2018).

The interviewees were from the following fields:

Start-ups

- **two founders of GovTech start-ups who sold their companies, but remain connected to the space either as independent consultants or University lecturers;**
- **one innovation strategist at a start-up who participated in ISA2 Innovative Public Services' Digital Innovation Challenge;**

- **three owners/co-founders of start-ups who participated in ISA2 Innovative Public Services' Digital Innovation Challenge;**
- **founder of a start-up who has worked with the Spanish government and has applied to EU grants;**
- **one co-founder who has participated in EU programmes like EUvsVirus hackathon.**

Government, GovTech programmes and ecosystem

- **the founder of one of the largest hackathons organized during the pandemic;**
- **several open innovation experts in government who are applying additional PPI instruments beyond venture capital to connect the GovTech scene to government actors;**
- **three heads of national GovTech programmes;**
- **three directors/partners of acceleration programmes;**
- **a CEO of a start-up platform/hub;**
- **the founder of a platform for start-ups working with government;**
- **a Regional Manager and a Programme Manager for a start-up platform;**
- **a senior programme manager at a regional Innovation Agency;**
- **a founder of a start-up consultancy;**
- **a Global Partnerships Manager at large tech event platform;**
- **an Innovation manager who has worked on tools for the European Citizens Initiative;**
- **two open innovation specialists in a central government agency;**
- **a director general at a Ministry of Science;**
- **four government digital transformation advisors/heads;**
- **the head of an innovative procurement agency.**

The topical areas of the expert interviews focused on: (1) **pre-existing experience with GovTech incubators or accelerators**, (2) **aspects that support the use of or collaboration with GovTech incubators or accelerators**, and (3) **other types of innovative public procurement of technology and innovation**. These rather open-ended interview questions were designed to access innovative knowledge about decisions, strategies and processes that the interviewed experts must consider in order to navigate and make sense of GovTech.

The interviews were recorded with the permission of the interviewees and transcribed verbatim for accuracy purposes (Butler, 2015). Confidentiality was promised to each interview partner. In a second step, the authors of this report wrote short memos to create a log of first impressions derived from each interview as part of the analytical process (Montgomery & Bailey, 2007).

In order to analyse the interview texts, initial conceptual frameworks were derived from the systematic literature review for different categories of interviewees depending on the focus of the interview. In this analytic step, the researchers extracted common themes from the interviews, grouped them into higher level categories, and subsequently interpreted their meaning.

Additionally, interviews were analysed to identify drivers, barriers, and enablers for government interacting with start-ups and SMEs. Furthermore, the interviews looked for best practices for setting up and running GovTech Incubators, as one way to bring together start-ups, SMEs and government.

3 Background on public procurement of innovation

Before understanding GovTech, we first need to understand public procurement of innovation (PPI). From a practical point of view, this is crucial because every purchase by government of a product or service falls under procurement rules. PPI is currently one of the main avenues for government to buy and, together with the private sector, develop innovative solutions. Therefore, GovTech cannot be understood or fostered without understanding the procurement frame in which it most often takes place. Furthermore, from an academic point of view, different from GovTech the study of PPI is a rather established research field. It can therefore offer useful viewpoints and categorisations to help understand GovTech. This report provides an overview of public procurement of innovation based on a review of academic literature.

The literature on public procurement of innovation can be distinguished into two lines of inquiry: a) **innovation in public procurement**, and b) **public procurement of innovation**. To fulfil the eligibility requirements, we focused on the latter aspect and excluded articles that aimed to innovate the public procurement process itself.

Lastly, the remaining 35 articles were coded using a thematic approach. The following themes can be identified in the literature: (1) **definitions of public innovation procurement**, (2) **purpose of public innovation procurement**, (3) **barriers and obstacles of public innovation procurement**, (4) **procurement models**, (5) **public innovation procurement process**, and (6) **public innovation procurement impact**. Each will be discussed in the following findings section (Moher, 2009).

The identified and included literature can be divided into conceptual and empirical articles, and among those specific country cases. The selected empirical articles focus on cases in individual countries, including the Baltic countries, Canada, Germany, New Zealand, Poland, as well as overviews of several EU countries (see, table 1).

Table 1: Summary of literature review

Conceptual articles	Empirical articles	Cases
Appelt and Galindo-Rueda (2016); Bleda and Chicot (2020); Czarnitzki, Hünermund, and Moshgbar (2018); Edler and Uyarra (2013); Edquist, Vonortas, Zabala-Iturriagagoitia, and Edler (2015); Edquist and Zabala-Iturriagagoitia (2012); Georghiou, Edler, Uyarra, and Yeow (2014); Hoppe and Schmitz (2013); Johnson and Robinson (2014); Lember, Kalvet, and Kattel (2011); Lember, Kattel, and Kalvet (2014); Lenderink, Halman, and Voordijk (2019); Obwegeser and Müller (2018); Rolfstam (2012a, 2012b); Telgen, Harland, and Knight (2007); Torvinen and Ulkuniemi (2016); Uyarra (2016); Uyarra, Edler, Garcia-Estevez, Georghiou, and Yeow (2014); Uyarra and Flanagan (2010); van Putten (2012); Yeow and Edler (2012)	Amann and Essig (2015); Bogers, Bertello, and De Bernardi (2021); Czarnitzki, Hünermund, and Moshgbar (2020); Edler et al. (2005); Edler and Yeow (2016); Edquist and Zabala-Iturriagagoitia (2012); Georghiou, Li, Uyarra, and Edler (2010); Kautsch, Lichoń, and Whyles (2015); Liu and Wilkinson (2011); Miller and Lehoux (2020); Rolfstam (2012a)	Baltic countries (Lember, Kattel, & Kalvet, 2015) Canada (Miller & Le-houx, 2020) Germany (Czarnitzki et al., 2020) New Zealand (Liu & Wilkinson, 2011) Poland (Kautsch et al., 2015) EU (Amann & Essig, 2015; Bogers et al., 2021; Georghiou et al., 2010; Stojčić, Srhoj, & Coad, 2020)

Source: Own

3.1 Defining public procurement of innovation

Below we define public procurement of innovation, sometimes also called public procurement of innovative solutions, or formerly, public technology procurement. It is a policy instrument to stimulate innovation through which a government agency can place an order for a product which is not available in the form of an off-the-shelf product or service in order to meet changing societal needs for innovation (Czarnitzki et al., 2018, 2020; Edquist & Hommen, 2000; Georghiou et al., 2014). This means that new technologies or other types of innovations have to be created to fill the identified gap.

Edquist and Zabala-Iturriagagoitia (2012:1758) define PPI as follows: "Public Procurement of Innovation (PPI) occurs when a public organisation places an order for the fulfilment of certain functions within a reasonable period of time (through a new product). Hence, the objective (purpose, rationale) of PPI is not primarily to enhance the development of new products, but to target functions that satisfy human needs or solve societal problems." This was previously known as "public technology procurement" (Edquist & Hommen, 2000).

Leaning heavily on Edquist & Hommen's (2000) definition, Hommen and Rolfstam (2009:20) explain that PPI "occurs when a public agency acts to purchase or place an order for, a product – service, good, or system – that does not yet exist, but which could probably be developed within a reasonable period of time, based on additional or new development work –e.g., R&D - by the organisation(s) undertaking to produce, supply, and sell the product."

PPI therefore does not only include the search for a solution, but also means that other than during the regular public procurement where agencies buy existing products or services available on the market, research and development is a necessary part of the procurement process (Edquist & Hommen, 2000).

The definitions identified in the literature highlight that PPI is predominantly conducted in the public sector to fill a need that society has developed for which the market has not developed a solution yet. It focuses on rather complex, wicked problems for which a product, service or other type of solution has not been developed or is not on easy supply by the market – for different reasons (size of the market, initial investment, uncertain development, etc.).

3.2 Purpose of public procurement of innovation

Edquist and Zabala-Iturriagagoitia (2012) identify public demand as the main engine for the development and diffusion of innovations. As a result, they see PPI as a means to satisfy human needs, and/or to solve societal problems (Edquist & Hommen, 2000). They highlight that these societal needs are not met by the market and have therefore become mission-relevant.

The needs that PPI is filling can be distinguished into intrinsic, congeneric, and extrinsic needs (Hommen & Rolfstam, 2009):

- **intrinsic needs** are mission-oriented needs that pertain solely to a single organisation (as an example, ESA might need a glove made of a specific fabric usable in space);
- **congeneric needs** are shared by the procurement agency on the demand side, but also other potential buyers (as an example, a public agency needs a notification and scheduling system, that other agencies can use as well); and
- **extrinsic needs** are needs that are pertaining to other buyers than the procuring agency (as an example, one central agency is responsible for buying all products and service for several ministries and therefore the procured innovation is not part of their own core mission, but instead it helps to fulfil other agencies' needs).

One of the main purposes of PPI is the connection between the demand side and the supply side of innovation (Edler & Yeow, 2016): The procurement process brings together actors with complementary skills to create the innovation (and subsequently diffuse the innovation into society). In the process, especially public agencies might be taking the role to create markets for innovation that were not naturally evolving because of the lack of incentives, low number of adopters, lack of funding or other reasons (Bleda & Chicot, 2020; Edler & Yeow, 2016).

Edler and Yeow (2016) described this process early on as a justification for public agencies to serve as the lead user or the "first user" of an innovation that can drive the demand. Given that the market is not always able to identify enough incentives to create a solution until demand is more clearly articulated by a public agency, this socalled **market failure** therefore needs to be mitigated through incentives set by a government actor to support the supply side in the development of the innovation. Public procurement for innovation can subsequently be seen as a mechanism for capacity and market building (Bleda & Chicot, 2020; Stojčić et al., 2020).

3.3 Models and processes for PPI

The literature on public procurement of innovation outlines different types of models that depend on demand for innovation, the type of innovation and existing arrangements of PPIs.

As an example, Lember et al. (2015) in their review show that there are direct, indirect, complementary and non-complementary approaches of PPIs and each have a different purpose:

Table 2: Characteristics of PPI approaches by Lember et al. (2015:410)

	Rationale and logic	Archetypical examples	Contemporary examples
Direct approaches to PPI	To pull from innovations by using performance specifications and other innovation-conducive methods; legitimization through more efficient and effective public services.	Competitive as well as negotiated tendering dual-sourcing and coordinated procurement within consortiums/ networks in Japan's technology development programmes around 1960s.	Systematic attempts to promote PPI and revise legal norms in various countries.
Indirect approaches to PPI	To scale up and diffuse existing innovations; legitimization through public missions.	Large military technology procurement programmes.	Pharmaceutical's development and energy technology programmes in various countries.
Complementary approaches to PPI	To complement supply-sided policies; legitimization through traditional supply-driven policies.	SBIR-type of programmes in the US.	Pre-commercial public procurement programmes in the UK, the Netherlands and other countries.
Non-complementary approaches to PPI	To substitute dominant supply-sided policies; acknowledging the central role of the state in innovation and technology development.	Public procurement as part of import substitution industrialization strategies in Latin America.	Explicit PPI initiatives in various countries with dedicated funding.

Source: Lember et al. (2015:410)

In their review piece, Hommen and Rolfstam (2009) suggest the following taxonomy of interactions during the public procurement for innovation process (see, table 3 below). They show that through the different types of interactions (arrangements of actors), learning, knowledge exchange and trade networks can be created that subsequently address different types of innovation creation needs:

Table 3: Modes of interaction in the public procurement for innovation process (Hommen & Rolfstam, 2009:27)

	Aspects of User Producer Interaction		
Modes of Interaction	Interactive Learning Contexts (Networks).	Demand Structure.	Needs Addressed.
Direct	Development Pairs (simple networks or dyadic relationships).	Monopsony (markets with a single buyer).	Intrinsic Needs (pertaining solely to buyer organisations).
Co-operative	Knowledge Networks (horizontally extended).	Oligopsony (markets with several buyers).	Congeneric Needs (shared by buyer and other organisations).
Catalytic	Trade Networks (vertically extended).	Polypsony (markets with many buyers).	Extrinsic Needs (pertaining to other actors than buyer organisations).

Source: Hommen & Rolfstam (2009:27)

Edquist and Zabala-Iturriagagoitia (2012) argue that there are two main distinctions of PPI processes: Direct and indirect PPIs.

- In a **direct PPI process,** the procuring organisation is also the end-user of the innovation or the resulting products and services. This is especially the case when the need is directly related to the mission or mandate of the public agency itself and serves its direct need satisfaction. The result of the PPI is therefore not necessarily the diffusion of the innovation into society, instead it mostly focuses on the actual identification and acquisition process of an innovation that is not necessarily readily available on the market. The PPI process might very well later on lead to diffusion into society after the initial purpose is fulfilled. An example is military equipment, such as the R&D into GPS and its now widespread use in mobile phones.
- In an **indirect PPI process**, the procuring organisation serves as a conduit or accelerator for innovation, for example, in cases where it has identified a demand that society in general has, no other market participant is willing to invest in the solution and the public agency might be the only player to fill the need. The innovation is then diffused to other (government and societal) actors.

The types of procurement process can be divided into four different forms: catalytic, pre-commercial, adaptive, and developmental:

Table 4: Types of PPI based on (Edquist & Zabala-Iturriagagoitia, 2012)

Catalytic PPI	Pre-commercial PPI	Adaptive PPI	Developmental PPI
Procurement agency serves as catalyst, coordinator and technical resource.	Procurement of (expected) research results (direct public R&D investments): "contract" research.	Product or system procured is incremental and new only to the country (or region) of procurement.	Completely new-to-the-world products and/or systems are created.
Public agency acting as the 'buyer'.	No actual product development.	Innovation is required in order to adapt the product to specific national or local conditions.	'Creation oriented' PPI.
Procure new products on behalf of other actors.	Public agency not involved in the purchase of a (non-existing) product.	'Diffusion-oriented' or 'absorption-oriented' PPI.	Radical innovation.

Source: Edquist & Zabala-Iturriagagoitia, 2012

Beyond PPI, alternative ways of meeting societal grand challenges (Edquist & Zabala-Iturriagagoitia, 2012) are R&D funding, tax credits, environmentally motivated regulations and standards (e.g., mileage standards for automobiles), creation of markets for innovative ideas, support for education and training or enhancing capacities for knowledge exchange.

4 Understanding GovTech?

GovTech is a fairly recent term and relatively novel as a policy field. This also leads to a lack of a clear definition of what it means. Justyna Orlowska, Director of GovTech Polska, underlines this point: „The absence of an established definition is perhaps the best indicator how new, broad and rapidly developing the field is.[2]“

For this report, we analysed different definitions. Although there are many - oftentimes competing - definitions of the term GovTech, most definitions share the following common three elements:

1. **the public sector engages with start-ups and SMEs to procure innovative technology solutions,**
2. **for the provision of tech-based products and services,**
3. **in order to innovate and improve public services.**

Based on this definition, we will now look at why governments are becoming active in this field, how they are becoming active, what are the dynamics of the GovTech market in Europe, and which challenges actors in this newly emerging field are facing.

4.1 Why are governments engaging with GovTech?

As a next step, we discuss the drivers that lead governments to invest time and resources into the GovTech market beyond the traditional forms of procurement and acquisition from existing vendors and service providers. These reasons cut across the different forms of how governments engage with GovTech that we will discuss further below.

4.1.1 Co-create innovation for government

One of the main drivers for government to engage with GovTech as a way to procure technology is the need for innovation creation in government. Through direct involvement in the direction and implementation, governments can act in more strategic ways to explore their own technology needs and directly participate in the user-centric design of new technologies. They are interacting directly with all stakeholders of the GovTech ecosystem and are not only acting as a buyer. This focus on innovation and co-creating solutions for government might also be crucial in the context of the recovery from the Covid-19 pandemic. In the EU, through the Recovery and Resilience Facility (RRF), more than EUR 20 billion (at the time of writing) will be invested in modernising the public sector with digital technologies. This poses the great challenge, to make sure these funds are used to procure effective and forward-looking solutions.

4.1.2 Activate the market to provide more innovation

Given the general setup of the GovTech market (further described below), it is important to understand what might drive governments to engage with GovTech. From the theory outlined in the systematic literature above, the general assumption is that governments have identified a societal need for which the market has not created a solution yet. Governments therefore are the only institutions able to a) **identify the need**, b) **incorporate the need and its subsequent solution into its mission and mandate**, c) **actively search for a solution**, and d) **procure the solution**. However, if the market is not able to provide the needed innovation, governments might decide to intervene.

2. Web citation

The objective might be to procure new products in order to introduce more competition into the market, reduce complacency and increase innovativeness among market participants. Others observe that only governments are willing to invest in technology innovations that might be too innovative or too costly to be created by other market players. In order to close the gap between the needs of governments and the lack of available GovTech solutions, governments can use GovTech programmes such as incubators or accelerators to support the development of technology innovations and keep prices for products and service low and accessible to society.

Another driver might be to build a more robust economy by creating competing products to the market that is dominated by a handful of non-EU companies. This would then build a counterweight to the observed market dominance and build up technology sovereignty in the EU market space for GovTech.

4.2 How are governments engaging with GovTech?

There are many reasons why governments are active in the field of GovTech. In our interviews, we identified the following clusters of how governments are engaging with GovTech: Creating networks and building communities; creating innovation knowledge; fostering innovation; implementing innovation; and setting standards.

4.2.1 Building ecosystems of market actors

Engaging in GovTech can help bring together potential market participants, who would have otherwise not met. This convening ability of government organisations can for example bring student contest participants together with large IT companies or public service providers to give them access to technological infrastructure and data. The outcome is therefore not a measurable innovation for government itself, but an innovation for the public good. Here the lines between GovTech, and generally supporting innovation for the public good are less clearly defined. In addition to one-on-one encounters between individual market participants, government also sets itself up as a community builder around certain types of innovations.

The outcome can then be an angel investment or venture capital influx to support a research idea to develop into a start-up, or support existing SMEs on their way to gain more market share. As one interviewee put it:

> **"Sometimes the challenge can be used as a catalyst like an angel investor of sorts, in terms of hey, we want the market to start creating applications for young workers, or applications around imagining work during the hot summer months like heat-ups. And then the market takes it from there."**

Without the initial investment or community building efforts run by government, start-ups especially might not be able to survive on their own or enter the market space.

4.2.2 Creating innovation knowledge

Bringing in gifted individuals with highly specialized knowledge from the private sector has become a form of creating innovation knowledge for government, as one of the interviewees highlights:

> **"There's plenty of knowledge in the market, but I think that there's a great amount of knowledge already within the administration based upon the type of people that's brought in."**

Governments can leverage existing knowledge which is then part of the body of government, or reach out to people with the knowledge that is needed ad hoc. These types of fellowships allow the knowledge transfer on a need-based exchange, instead of hiring contractors with comparatively high prices.

These types of fellowships have recently gained acceptance and programmes such as the US Presidential Innovation Fellowship or the Tech4Germany and Work4Germany fellowships provide a. few examples. The programmes actively recruit individuals with specialized knowledge and skills that are not available in

government into programmes and initiatives in which they can apply their skills for the public good. Onboarding is oftentimes difficult given the remuneration differences and HR job categories, which don't allow for the same flexibility or salaries as the private sector market.

The fellows are teamed up in the form of a tandem with government sponsors and work for a fixed time on a specific project or programme. The innovation here is not just the creative end product, but also the innovative form of HR instrument that aims to supplement existing hiring for specialized knowledge. The additional value created through fellowships has the potential to influence how public administrations are innovating. Civil servants and public managers are exposed to new work modes and experiences that might later be transferrable back into the line organisation to shape future innovation approaches. Another instrument are secondments and rotations: which provides the ability for high-skilled experts from the private sector to join civil service for a limited period of time.[3]

Additionally, some of the larger private sector organisations with non-profit branches volunteer their knowledge to government – one such example is IBM's Center for the Business of Government, IBM's non-profit branch that "translates" academic studies into practitioner-oriented solutions and policy briefs.

4.2.3 Fostering innovation

In addition to building networks and communities for innovation, or building knowledge through fellowships, government can also directly engage in fostering innovation. For purposes such as the incubation of ideas or the generation of innovative knowledge, the public sector has recently invested into many forms of how government fosters innovation with GovTech. These include two main venues: 1) **innovation labs**, and 2) **contests, grants and prizes**.

Innovation labs

Innovation labs, policy or living labs, are forms of incubators that are either directly sponsored by governments, embedded as part of an agency, or are run in form of a public-private partnership. They are set up outside of the linear bureaucracy and allow for innovative forms of innovation creation (for an overview, see, Tõnurist, Kattel, & Lember, 2017). They are created in laboratory-like environments, that means a) physical spaces that are de-signed to foster innovation through the arrangements of furniture, additional movable furnishings to foster co-working and demonstration, b) the type of work modes and methods that are applied, such as design thinking, c) their openness to actors who are not part of the formal bureaucracy.

They are fostering innovation by allowing public servants to step outside the linear bureaucracy and allow them to experiment with new methods or test machines and tools that are not part of traditional standard operating procedures of government.

The outcomes can be concrete outputs, such as prototypes of a digital service, models of a tool in 3D-print, or intangible assets, such as knowledge or skills learned using new methods and approaches that may or may not be transferable into the bureaucracy.

Contests, grants and prizes

Another policy instrument are contests, grants, and prizes that governments are using for marketing purposes or to reach otherwise unreachable communities or civil society actors who rarely engage with government. In the form of open innovation contests, governments are posing challenges that have not yet been fulfilled by market actors and for which no solution is available at the moment.[4] These contests can take on forms, such as hackathons or challenges for which a winning prize is given to the submitters with the best ideas. Governments can then decide whether to further use the innovation, support the submitter in implementing the innovation, or simply use the contest as a marketing instrument and create publicity around certain issues.[5]

3. Link

4. Mergel, I. (2018). Open innovation in the public sector: drivers and barriers for the adoption of Challenge.gov. *Public Management Review*, 20(5), 726-745.

5. For a full discussion of contests, see forthcoming JRC report by Mergel (to be published in 2022).

4.2.4 Implementing innovation

One of the ways that governments are engaging with GovTech is a faster implementation of innovative solutions. This was shown in the **#WeVsVirus hackathons**, where innovations were implemented right away without a long and tedious vendor search. This outcome toward ad hoc implementation was stated by one of the interviewees:

> **"Our worlds are not hash based. We will fly you in to work with the agency in fine tuning the application. Or we are providing employment and training (to implement the innovation)."**

As with many issues related to innovation, the effects of developing GovTech solutions or procuring them as PPI is rather difficult to measure. There is a general assumption that because innovation is something new to the organisation, it is beneficial in itself. Oftentimes, measurement or assessment is therefore only a binary variable: does the innovation exist at the end of the process or has the procurement process failed to acquire the innovation? Georghiou et al. (2014) even highlight that assessment is so far only done on an anecdotal basis.

Uyarra and Flanagan (2010) highlight that an assessment of the impact of public procurement of innovation heavily depends on the nature of the products and services that are demanded. As a result, the degree of innovativeness and its impact therefore depend on the type of innovation that is procured. They suggest the following framework by dividing the type of innovations into the following model by Kraljic (1983) on which an assessment can be designed:

Figure 1: Kraljic's (1983) purchasing portfolio model

Source: Kraljic (1983)

While innovation assessment and actual measurement remains a challenge, Georghiou et al. (2014) suggest a taxonomy to highlight which policy instrument is designed to address which deficiencies. Their effectiveness is subsequently measured as decreasing deficiency. As an example, SMEs are generally thought of as not getting access to public procurement of innovation given their size and history. If the number of SMEs participating in bids increases after a policy instrument is introduced, it is seen as a successful and effective measure. The following figure shows the deficiencies that need to be addressed through a PPI, the policy instrument type that is applied to counteract the deficiency and examples among European countries:

Table 5: Policy measures in support of innovation public procurement.

Policy category	Deficiencies addressed	Instrument types	Examples
Framework conditions	Procurement regulations driven by competition logic at the expense of innovation logic.	Introduction of innovation-friendly regulations.	2005 change inEU Directives including functional specifications, negotiated procedure etc.
	Requirements for public tenders unfavourable to SMEs.	Simplification & easier access for tender procedures.	2001 proposal in EU to introduce innovation partnerships.
			Paperless procedures, electronic portals, targets for SME share.
Organisation & capabilities	Lack of awareness of innovation potencial or innovation strategy in organisation.	High level strategies to embed innovation procurement.	UK ministries Innovation Procurement Plans 2009-10.
	Procurers lack skills in innovation-friendly procedures.	Training schemes, guidelines, good practice networks.	Netherlands PIANOo support network, EC Lead Market Initiative networks of contracting authorities.
		Subsidy for additional costs of innovation procurement.	Finnish agency TEKES meeting 75% of costs in planning stage.
Identification, specification & signalling of needs	Lack of communication between end users, commissioning & procurement function.	Pre-comercial procurement of R&D to develop & demostrate solutions.	SBIR (USA, NL & AUSTRALIA), SBRI (UK), PCP EC & Flanders.
	Lack of knowledge & organised discourse about wider possibilities of supplier's innovation potencial.	Innovation platforms to bring supliers & users together; Foresight & market study processes; Use of standards & certification of innovations.	Innovation Partnerships & Lead Market Initiative (EC), Innovation Platforms (UK, Flanders); Equipment catalogues (China to 2011).
Incentivising innovative solutions	Risk of lack of take up of suppliers innovations.	Call for tender requiring innovation; Guaranteed purchase of certification of innovation; Guaranteed price/ tariff or price premium for innovation.	German law enabling innovation demands in tenders; UK Forward Commitment Procurement; China innovation catalogues (to 2011); Renewable energy premium tariffs (DE and DK); Immunity & Certification scheme (Korea).
	Risk aversion by procurers.	Insurance guarantees.	

Source: Georghiou et al. (2014)

What becomes clear from the exiting literature and the practices stated in them is, that PPI assessment stays on a rather superficial level, without concrete KPIs to measure. As Uyarra (2016:np) clearly states:

> **"The effectiveness of certain instruments such as procurement plans in national ministries has been hampered by a lack of key performance indicators and a clear commitment and sanction mechanisms."**

This lack of measurement and assessment can be potentially mitigated by increasing the number of available and higher-quality procurement records, for accountability and analytical purposes. In their 2016 OECD report, Appelt & Galindo-Rueda emphasize the importance of data-linking as a mechanism for supporting the empirical analysis of the link between public procurement, innovation and business performance.

4.2.5 Setting market standards for innovation

Government is the largest procurer of products and services in the market. When it comes to certain types of technological innovations, especially digital public services, it is however considered a laggard. The digital transformation has received a boost during the pandemic, but it also became apparent that digital service delivery lags behind the private sector. Reasons are manifold, one is modernisation backlog, lack of digital competencies, vendor lock-in, etc.

One way that the UK government, as an example, has tried to intervene into this trajectory is to create its own **"Digital Marketplace."** This platform not only provides information on how to find existing suppliers for digital innovations, but also informs potential suppliers how to become a vetted supplier. It also displays information on how to procure for technological innovations. Moreover, it sets the standards for procurement.

For many start-ups and SMEs working with the public sector is a source of pride, and a validation towards other customers that their products and services meet high thresholds of quality. Some of national programmes would introduce marketplaces where new products marketed at the public sector clients – upon approval by a designated expert board – could get a special certificate, that is a sign for other public sector entities that the vendor is vetted, and its services meet certain standards (e.g., in the context of privacy or quality assurance). Similarly, creation of an EU-wide marketplace, and subsequent certification mechanism would allow to recognize products and services that work well for the public sector in one national context, and help start-ups and SMEs start selling to the public sector abroad. Some of the interviewees have underlined that in principle EU-backing is a great mobilizer for bureaucrats. Explicit encouragement for the creation and ramping up of national GovTech programmes could serve as a powerful tool to consolidate and legitimize the sector.

4.3 Understanding the GovTech market in the EU

The interviewees pointed to the fact that the general GovTech market itself is rather small in comparison to the consumer tech market. While vendors for other sectors provide technology for a whole service and across many different companies, the public sector is unique because it is split into many different types of services that oftentimes require unique technology solutions. There are very few products that can be built across different public services or other internal services. A solution sold to a ministry of environment might not be applicable directly to a ministry of social affairs or a finance ministry. Therefore, the only option to increase the customer base for many of the existing companies or start-ups willing to enter the GovTech market is to innovate their existing products for different types of customers. However, scaling up to other countries has its own challenges. Different countries have different languages, constitutional and regulatory contexts. Alternatively, start-ups can target sub-national levels of government. For start-ups it is therefore only possible to make incremental adjustment to their portfolio over time - if at all. Many will cater only to one country and won't be able to rollout their products to many different countries.

Given that the GovTech market operates in this rather distinct field, the interviewees pointed out that there are limitations on how business can grow:

> **"You go to Sandhurst Lane or whatever it is and you go raise a bunch of money and that's where you're going to expect to get the hockey stick growth where you have explosive numbers. But in order to do that you have to be able to attract and onboard customers in a very, very quick way which you simply cannot do in the government space. So, it's very hard to have... There's very few examples of that maybe some in the police force space, in the emergency services space, and then you have more growth and private equity, growth capital and private equity which is you come in and they want good growth but they're really like, can we double, triple, quadruple you in a five-year period but it's not 100x."**

Even though the European market consists of many different countries which might lead to the assumption of the existence of potentially many different markets, for each company looking to be supported by a GovTech accelerator, the explicit goal of any investor (public or private) would be to expand the number of clients rapidly. This would mean to build and customize products and services that can be marketed to all 27 member states, and different levels of governments and regions in one country's language. However, most vendors and especially SMEs in the space will have trouble customizing the services for each of the 27 countries and providing customer service for different languages.

The existing market of digital solutions is therefore - as one of the interviewees put it - "hogged" by a handful of large technology vendors that monopolize the market. According to this interviewee, those large vendors have no need to onboard venture capital, instead they use their other business lines to repurpose "free capital" in order to acquire smaller vendors and start-ups with the goal to concentrate on the GovTech market. The reason one of the interviewees pointed to is:

> **"If you look at most of the big software players, they're almost all either failed start-ups that just become growth equity firms that is a failed VC. It's still a successful company, that's fine, but the VCs don't love it. Or they're bootstrapped and what they tend to do is they tend to grow organically for the first ten to fourteen years of existence and then they get bought by a private equity firm that turns them into what gets called a platform, which is not a technical platform. It's simply a buyer platform and then they use that brand and the revenue from that organisation to then go buy adjacent companies which are usually struggling or failing government technology companies and then they basically are like, we have a sales team, we can attach that, and then we can just use that sales team to drive growth and then that growth then allows you to buy another company."**

Given the above-described scenario of the GovTech market raises challenges for governments to intervene and foster innovation.

4.4 Challenges for different actors in the GovTech field

The following sections elaborate on the challenges for different stakeholder groups. They include challenges for public sector actors and private sector actors.

4.4.1 Challenges for public sector actors

The barriers and obstacles to engaging with GovTech are mostly seen in the rather risk adverse nature of public sector agencies that are following path dependent procurement models and are heavily restricted by the legal frameworks they are operating in (Lember et al., 2015; Telgen et al., 2007). The result is that procurement partners on the supply side are chosen based on past performance and experiences or pre-set demographics, such as the size of the organisation, revenue, or other factors. As a result, the risk of failure is viewed as mitigated to avoid loss of taxpayer money on long production cycles with an unknown outcome (see, for example, Edler et al., 2005).

The procurement process itself is not set up to allow for innovation in procurement methods or to include the building of innovations as a result of the procurement process (Uyarra & Flanagan, 2010). At the same time, government organisations increasingly have to acquire innovative technology and other types of risky innovations for which little expertise is available inside the institution itself or even on the market.

Procurement processes in innovative arrangements are seen as uncertain and risky. They are time consuming to set up, might use too many resources and have an uncertain outcome. In their survey of European countries, Amann and Essig (2015) show that besides the risk perception, public agencies are shying away from engaging in public procurement of innovation processes, because they see the task in itself as too challenging and the problem as too complex to be able to solve it. Similarly, Liu and Wilkinson (2011) in their case study on New Zealand public agencies highlight how PPI is oftentimes seen as a way to create too many obstacles that need to be overcome before an innovation creation arrangement can become commonplace and is made available more broadly to the rest of government as a standard policy instrument.

4.4.2 Challenges for private sector actors

The challenges for private sectors actor include the dependency on venture capital which comes with growth expectations in a limited market space, a consolidated market space dominated by large-scale system integrators, and lock-in through path dependency in historic government software decisions.

Dependency on venture capital comes with growth expectations in a limited market space

Reliance on venture capital has severe implications for the organisations in the GovTech ecosystem, starting with the type of capital that can be accessed for companies at different stages of development, through the omnipresent drive towards mergers and acquisitions, to the pressure of growth to unlock new levels of funding.

The mandate to grow market share for VC-supported GovTech companies in the software development space has severe limitations in the public sector – e.g., due to the starkly different approach towards building a product vs. a service company. Most governments create public services and not so much products. Although not all start-ups depend on VC support, they are still challenged with not being able to afford the time or resources needed to seek out, apply, and win government contracts.

Growing market share when the public sector is the client is problematic and challenging because the only way to expand is by adding new clients, i.e., new government agencies, departments, etc. Even within one state, each agency and within each agency, there exist different types of technology infrastructure and data structures which can require significant costs for adapting solutions to another agency's needs. Companies must go through the entire lengthy procurement process again to secure contracts with other agencies even if within the same country. Furthermore, if a company wants to grow by providing its solution, for example for a health ministry, in one country to that of another, it is then dealing with an entirely different government, working in a different language, requiring a different set of standards or certifications, its own procurement rules, and its own unique infrastructure. Therefore, growth expectations take on an entirely new meaning in the public sector.

A consolidated market space dominated by large-scale system integrators

According to our interviews, existing GovTech market actors have grown to a size where it is difficult for entrants to compete with them. GovTech start-ups are acquired by larger players at the beginning of their development, consolidating dominance of existing actors. The goal of large players in such cases is to consolidate the market by buying up potential competitors without building the products on their own or investing in R&D, thereby expanding their own portfolio by integrating solutions and knowledge along its own perceived value chain.

These large-scale system integrators present a challenge to those in the private space that may have innovative solutions for the public sector because of the financial capacity and experience large system integrators possess which is necessary to navigate the procurement process and win contracts. Therefore, they may not always have the best solution, but they can use their resources to spend the amount of time it takes to respond to RFPs. Furthermore, established actors have the existing knowledge of how to work through the administrative aspects of public sector contracts. Competing with them can deter other private sector actors from even attempting to participate in GovTech related initiatives.

Furthermore, the path dependency of software decisions governments have made in the past can hamper innovations in the GovTech space. Due to lock-ins and path dependencies, new solutions and innovations are tightly knit to the software decisions governments have made before.

Entry barriers

EU procurement standards for digital solutions in the public sector can be difficult to navigate for start-ups who lack the expertise to interpret and implement them. They also sometimes don't have a dedicated expert to help them understand the technical needs and infrastructure. For these non-traditional actors, there's a lack of a central place for them to go and easily find opportunities to work with the public sector (access). Given the apparent dominance of the large established vendors and service integrators, who are

usually awarded contracts, government can seem too big to approach - especially for new start-ups with little or no experience navigating a complicated market space.

One major pain point acknowledged in typical government incubation programmes is the amount of time it takes to receive funding once it is awarded. Start-ups do not necessarily have a lot of capital and are often risking a lot financially to work on their products and ideas before having any contracts or orders. They simply cannot wait six months for grant money or have payments that are put off until the end of the project. Given the necessary focus on product development, it makes it difficult to build up expertise in government procurement. The result is that start-ups might not even know how to answer calls or RFPs. In addition to not having the time or capital to apply for these programmes, they also do not have the time and capital to search for grants, government incubators, and other public sector support or to know what is available to them.

5 Policy and practice recommendations

The following recommendations are divided into recommendations for innovating and expanding traditional procurement instruments and recommendations for setting up GovTech programmes.

5.1 Recommendations for innovating and expanding traditional procurement instruments

Formally innovating existing procurement and acquisition processes is oftentimes necessary to align with the innovation or technology work practices that are specific to technology innovations.

As one of the innovation managers in the interviews stated:

> **"It is very hard to manage the sustainability part after you award a price [or innovation budget – added by author for context] The incentive to maintain drops dramatically after a buzz is gone. [...] People get busy and may have new clients, or maybe they shifted focus, shifted interests. It's the equivalent of enthusiasm erosion. You can use [a procurement policy instrument] as a catalyst, like an angel investor of sorts if we want the market to start creating applications around [certain public sector problems] – and then the market will take it from there. But other times you want real applications that you can leverage. And when they are not maintained, that becomes a problem and then we wouldn't be responsible stewards of taxpayer money**."

This quote also highlights that user needs might be changing during the procurement of innovation period and there needs to be a way to adjust the focus and the specification throughout the process.

One approach to get out of the standard procurement corset with many legal constraints is a new policy instrument called agile Blanket Purchase Agreements (BPAs) (explained in more detail in Lehmann-Benz, 2019; Mergel, 2016; Mergel, Ganapati, & Whitford, 2020). In pre-contract sprints several vendors are asked to showcase whether they will be able to deliver on the promises they make in their offers. Similar approaches are "pay what you get" purchasing agreements, or "money for nothing, change for free" models, where fixed prices are paid for the core features of a technology, but changes incur at no additional costs. That way the risk of innovation procurement is moved to the vendor and does not end up in overrun projects costs.

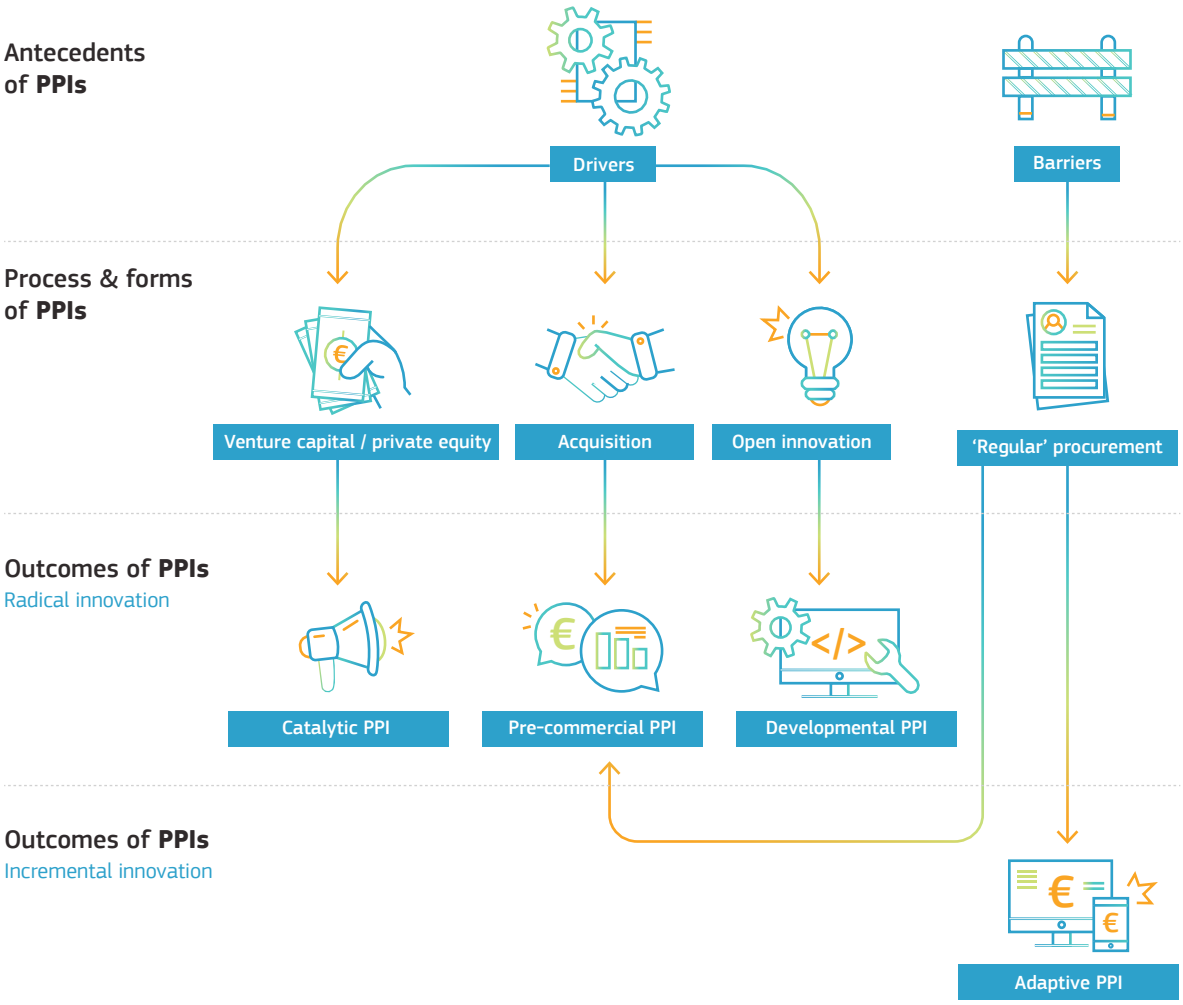
In summary, for future GovTech programmes, it would be useful to first understand what the antecedents are that are leading to a need on the demand side that either can or currently cannot be met by the supply side. A subsequent market scan of the existing GovTech scene can help to support the next decision phases.

The type of solution needed for an existing societal – and therefore governmental – problem then informs the type of public procurement for innovation instrument decision makers can select. These can either be incremental or radical innovations needed for the solution of a public sector problem and need.

In case the barriers might be too high for taking a rather risky route via more innovative PPIs, decision makers might choose a "regular" or traditional procurement instrument. However, the downside might be that only adaptive PPIs can be used and the outcome might be limited to incremental innovation.

In case the decision is made, that the risk is worth the potential solution and anticipated public values related to this solution are desirable enough, a riskier route via instruments, such as venture capital or private equity investments into existing companies and other forms of involvement with private sector partners can be chosen. Figure 2 below shows this graphically.

Figure 2: Conceptual framework for the assessment of PPIs



Source: Own

For future purposes, an initial assessment tool that might help to select the types of PPIs governments intend to invest in can take the following form (see, figure below). For each PPI, the initial need on the demand side is identified, the form of the policy instrument chosen, the type of innovation then needs to be derived, and its expected outcomes in form of public values or specific output in form of products of services can be inserted in the following form:

Figure 3: Assessment tool for the categorisation of types of PPIs

	Catalytic PPI	Pre-commercial PPI	Adaptive PPI	Developmental PPI
Need on **demand side**				
Form				
Types of **innovation**				
Innovation outcomes on **supply side**				

Source: Own

5.2 Recommendations for setting up GovTech programmes

Based on the empirical evidence, we offer three types of recommendations for governments to set up GovTech programmes:

1. **Goal setting recommendations**
2. **Implementation recommendations**
3. **Analytical recommendations**

5.2.1 Goal setting recommendations

The goal setting recommendations focus on issues surrounding the goals of GovTech programmes. It would be advantageous to discuss them before an implementation starts, so that risks can be distributed, but also to be able to address joint needs with diverse stakeholders.

Recommendation 1: Revisit and redefine the GovTech programme's goals

In the private sector, initiatives like incubators or accelerators aim for economic growth. However, the GovTech programmes sponsored by governments can focus on different types of public values that go beyond economic gains. Alternative values to address through GovTech programmes might include mission-orientation, quality of service and product development, inclusive and transparent ecosystems of vendors, generate well-paying jobs that will move the needle toward innovation, aggregate economic growth for the whole of the EU, proactive innovation development, or other types of societal and citizen-oriented public values.

Recommendation 2: Avoid competing goal setting activities for the GovTech programme

As many innovative setups, GovTech programmes, such as incubators and accelerators, are a result of a collaborative effort for which a "coalition of the willing" is necessary. This will include those who focus on improvements of innovation creation, others might focus on mission support, or are interested in market creation, and others might only want to use the results produced by GovTech programmes. To make all this happen, political and financial support from different stakeholders is necessary. The challenge will be that those stakeholders with the largest purses do not dominate the decision making and that the GovTech programme can avoid competing goals among stakeholders involved. The threat to this effort can be that mostly monetary and financial goals will come more to the foreground of future decision making and push aside higher-order goals of public value creation. An example for contradicting and competing goals is: One stakeholder might want to diversify the vendor pool; another stakeholder might solely focus on attracting bigger companies into their country to increase jobs. Others might focus on soft power to create a political and economic counterweight to international firms.

Recommendation 3: Create policy instruments that support general public innovation creation

In an ideal world, from the perspective of SMEs and start-ups, the barriers for market entry would be decreased for start-ups or SME and increased for billion-dollar companies or their access to the market can be restricted to certain types of requests for proposals (RFPs). This would mean that the ecosystem or the constellation of market participants can be changed proactively by a GovTech programme. One approach to facilitate this shift in types of participants is to differentiate between different types of innovation that are expected from participants, as well as a segmentation of the approaches and participants who are allowed to compete.

Another approach might be to back a range of mid-sized new companies to help increase their capacity, so that they will be competitive in comparison to the existing companies who are dominating the market. This would help in providing them with resources needed to hire sales personnel and contracting roles to guide negotiation processes during the RFP stages and manage interactions with government, contracts and clients.

5.2.2 Implementation recommendations

The second category of recommendations focuses specifically on the implementation of innovative procurement instruments for GovTech programmes.

Recommendation 4: Provide guidance on how to conduct public procurement for innovation

Market entry and participation in government procurement processes is especially difficult for start-ups and SMEs with little experience and by definition a low number of staff. The question is how to incentivize the participation of those who might potentially be the ones who develop the type of innovations that can't or won't be supplied by large providers. GovTech programmes could provide guidance on how to participate in the process and provide stewards on how to sell to government and conduct negotiations. For this purpose, GovTech programmes themselves might have to create a budget with specific categories for PPIs that are only targeted at funding the desired diverse pool of vendors.

Recommendation 5: Show, don't tell

Requests for proposals (RFPs) and other types of procurement processes usually have a set threshold for deliverables at a certain price tag and list of requirements. Included in a pre-set price are certain key features of a product or solution that a potential vendor has to include – which is used at the end of the project to compare whether the deliverable was indeed achieved. This is usually demonstrated by a long list of reference projects that companies provide during the bidding process. However, for many start-ups this is a 1-0 calculation: can they prove prior project experience Yes or No? This approach, however, excludes many start-ups and SMEs that can't prove the type of project experience that is oftentimes required. An innovative approach would be to buy for quality and ask bidders to show prototypes of potential solutions during the procurement process early on, so that governments can decide based on additional evidence that a start-up is likely to perform to the quality standards requested and is able to deliver on its promises. Policy instruments, like agile Blanket Purchase Agreement (BPAs), can be the way to accomplish this goal.[6] Agile BPAs require vendors to submit a working prototype and then show their work in a publicly available git repository.

Recommendation 6: Build capacity and competencies to buy for quality

Oftentimes procurement of innovation is left to contract staff members with a legal background instead of knowledge and competencies in technology. This means that contracts are managed for deadlines and submission of deliverables, but not for quality. The competence to negotiate on eye level is missing – even though the legal expertise is clearly well-developed. Building up technological and digital competencies is therefore necessary to procure for innovations.

This is an especially important task for the initial set-up phase of GovTech programmes: It will be necessary to bring in people who have expertise to build a successful start-up, who know about the entry barriers and have navigated them successfully. This type of knowledge and expertise is necessary to direct resources, help set up the infrastructure, direct policies and implementation. It would not be helpful to simply copy successful strategies from consumer tech playbooks and aim to replicate them for this context.

6. See, Mergel, I. (2016). Agile innovation management in government: A research agenda. Government Information Quarterly, 33(3), 516-523.

Recommendation 7: Open-ended RFP processes

RFP processes are heavily influenced by vendors who help public administrators define the requirements of the product or service they need to in order to fulfil their mission. If we continue to predefine requirements, especially for innovations for which a solution does not exist, there will only be a preselected number of vendors who feel encouraged to apply. This also means that there will remain a few preferred vendors who know exactly what the requirements are because of the tendency to write RFPs that encourage some while at the same time discouraging others from even participating. One such instrument that can help start-ups is the "Innovation Procurement Platform" from EU's Procure2Innovate project.[7]

Recommendation 8: Create incentives for implementation

In order to diffuse the resulting innovations, create an incentive structure so that the implementation and use of the innovations among government actors and society can be guaranteed. This can be done by instituting tandems in the form of agency-level supporters or champions for the innovation together with the innovators. Another option is two-tiered innovation budgets: one for the procurement and acquisition, and another, equally important one for the implementation and diffusion.

5.2.3 Analytical recommendations

The last category of recommendations is labelled analytical, because it is directly derived from the analysis of the interviews.

Recommendation 9: Diversify investment resources

Traditionally, investments in GovTech programmes are coming from Ministries of Finance or Treasury Departments with the goal to gain financial rewards from their investments. This is an approach that can create financial public value for the taxpayers, however it will likely dominate the goal setting process so that economic growth could likely move to the centre of all considerations and decisions.

Therefore, it might be useful to rethink this traditional approach and look for ways to diversify the investment sources, motivations and incentives for desired market participants to participate, and expand the expected outcomes toward a value-driven approach.

Recommendation 10: Build a GovTech ecosystem

Based on EU principles, such as inclusion, transparency, sustainability, etc., aim to diversify the risk of investment and create public value by distributing innovation creation across different types of initiatives with and without financial investments. The outcome would be a programme to support the creation of a GovTech ecosystem following best practices from existing examples.

7. See, EU's Innovation Procurement Platform

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List of abbreviations and definitions

- **PPI** - Public Procurement for Innovation
- **RFP** - Request for Proposals

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