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Success Factors and Barriers of GovTech Ecosystems: A case study of GovTech ecosystems in the Netherlands and Lithuania

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ABSTRACT

GovTech, an acronym of Government Technologies, is a novel concept that is gaining attention in the public and private sector. It entails improving the design and delivery of human centric public services and data-driven processes with the use of emerging (digital) technologies. Furthermore, GovTech is concerned with the development of digital technologies that are used in these processes or services, but that are often developed by organizations outside the public sector. As a result, GovTech ecosystems emerge, in which public and private organizations as well as civic partners, including citizens, collaborate. GovTech ecosystems can be defined as networks of citizens, public and private actors, academia, and (venture) capital involved in the development of technological solutions to address public challenges. At this moment, literature on GovTech is still scarce and empirical studies into the emergence and impact of GovTech ecosystems are even scarcer. Therefore, this study explores the emergence and development of GovTech ecosystems. More specifically, the goal of this study is to contribute to the understanding of the barriers and success factors for the emergence of GovTech ecosystems. To do so, this paper conducts an explorative case study of success factors and barriers of GovTech ecosystems in two frontrunner countries: the Netherlands and Lithuania. Regarding the emergence of GovTech ecosystems, we find that the way in which the two GovTech ecosystems emerged and are built up, differs. Whereas the ecosystem in Lithuania is more centralized, the ecosystem in the Netherlands is more scattered. In addition, we find that factors that contribute to successful GovTech ecosystems include public-private collaborations, having a clear vision and strategy, sufficient space for experimentation, having infrastructure, networks and initiatives in place that stimulate sharing of knowledge and resources, and the presence of a culture of co-creation and innovation.

CCS CONCEPTS

• **Computing / technology policy**; • **Government technology policy**;

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KEYWORDS

Digital Transformation, GovTech, Ecosystems, Procurement

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1 INTRODUCTION

Over the past years, public sector organizations increasingly embraced the potential of innovative (digital) technologies such as artificial intelligence (AI) and blockchain technology (BCT) that may contribute to solving societal challenges and achieving more effective and efficient use of public resources. At the same time, governments all over the world are facing societal challenges such as the energy transition, COVID-19 health crisis and an ageing workforce, while at the same time having to deal with capacity issues within their own public sector organizations. More recently, the concept of 'GovTech' emerged within the public sector, which is an acronym for Government Technologies [1-3]. GovTech entails improving the design and delivery of public services and data-driven processes with the use of these emerging technologies [2, 4-5].

The concept of GovTech originates within the wider field of Digital Governance, but focuses more specifically on achieving citizen-centricity in government services and processes using innovative technology on the one hand, and on the development of these technologies by private or non-governmental organizations - not just public organizations - on the other hand [2, 5, 6]. Because of the joint development of these technologies by different (types) of organizations, GovTech ecosystems emerge [1, 7]. Hoekstra et al. [5] define GovTech ecosystems as "networks of citizens, public and private actors (including SME's and start-ups), academia, and (venture) capital involved in the development of technological solutions to address public challenges". However, while the use of digital technologies such as AI and BCT in the public sector gained more attention in the academic literature, studies on the concept of GovTech, as well as on specific characteristics of this phenomenon, are still scarce. While most of these studies focus on the conceptualization of GovTech, empirical studies on the emergence of GovTech or GovTech ecosystems are even scarcer. Therefore, this study explores the emergence and development of GovTech ecosystems, thereby also contributing to the nascent body of literature on GovTech. Specifically, the goal of this study is to contribute to the understanding of the barriers and success factors

for the emergence of GovTech ecosystems. The central question is formulated as: what are the barriers and success factors of GovTech ecosystems?

To explore the emergence of GovTech ecosystems, this study conducts explorative case studies in the Netherlands and Lithuania. We selected those two countries as they both have emerging GovTech ecosystems and they are both characterized as frontrunners of GovTech [6]. Exploring frontrunner countries allows us to learn from the still early stage developments of GovTech. This paper is structured as follows. First we deepen our understanding of the GovTech concept and we subsequently conceptualize GovTech ecosystems based on literature of Digital Governance and Innovation Ecosystems. Second, a description of the methodology to conduct the case studies is presented. Third, we present the results from the explorative case study on GovTech ecosystems in the Netherlands and Lithuania. Finally, the paper concludes with a discussion of the findings, conclusions and recommendations for future research.

2 THEORETICAL BACKGROUND

2.1 GovTech: definition and characteristics

Since the concept of GovTech is still rather new, we need to get an understanding of this concept, before we investigate the notion and emergence of GovTech ecosystems. GovTech, an acronym of Government Technologies, is a novel way of conceptualizing the use of digital technologies in the public sector. However, a generally accepted definition of GovTech is still lacking and academic definitions are scarce. An abstract – title – keyword Scopus search of GovTech resulted in fifteen results, of which only five articles specifically have GovTech as the focus of their research [2-4, 8, 9]. In his paper on developing a research agenda for GovTech, Bharosa [2] conceptualizes GovTech as: "GovTech refers to socio-technical solutions – that are developed and operated by private organizations – intertwined with public sector components for facilitating processes in the public sector" [p. 3]. Elements central to this definition are, thus, the development of solutions, and the intertwining of public and private organizations to develop these solutions.

If we look beyond academic literature, we find more policy studies on GovTech [e.g. 1, 6, 7]. These policy studies and 'grey' literature provide more definitions, but their interpretation of GovTech differs. On the one hand, the World Bank [6] definition of GovTech is citizen as well as transformation focused: "GovTech is a whole-of-government approach to public sector modernization that promotes simple, efficient, and transparent government with the citizen at the center of reforms"[p. 2]. In a similar vein, but more specifically focusing on technological products than as an approach, Hoekstra et al. [5] define GovTech as: "a term that is used to refer to technological (mostly digital) products developed to support the delivery of public services to citizens and businesses or the internal operations of public administrations" [p. 14]. The definition of the European Commission [10] on the other hand is focused on collaboration between public and private actors and digital transformation: "GovTech means a technology-based cooperation between public and private sector actors supporting public sector digital transformation"[p. 23]. A definition by Mergel et al. [7] emphasizes start-ups and SMEs as developers of GovTech with the aim to improve and innovate public services: "the public sector engages with start-ups and SMEs to procure innovative technology solutions for the provision of tech-based products and services in order to innovate and improve public services"[p. 17].

While clearly no unified definition of GovTech is available yet, certain key characteristics can be derived based on literature. Firstly, while technology does not necessarily imply digital technologies, GovTech clearly has a focus on digital technologies and digital transformation within the public sector [1, 6, 10]. GovTech, thus, implies a focus on the role of innovative digital technology in public services and data-driven government [2, 5]. Secondly, GovTech aims to develop solutions for citizen-centric public services and data-driven government aiming to solve societal challenges, such as digital identities, AI-driven decision support systems for policy makers and drones for inspection of dikes [2]. Thirdly, there is a focus on public-private intertwinement, looking into the interdependence of private sector organizations and public sector organizations and at ecosystem building of this intertwinement [2]. Here, intertwinement signals the need for coordination and mutual adjustments between public and private parties in a GovTech ecosystem.

2.2 Conceptualizing GovTech ecosystems

To understand these interdependencies and their implications for GovTech ecosystems, we draw on two different strands in literature: (1) Digital Governance and (2) Innovation ecosystems. Digital Governance can be defined as "the use of information technology to improve government operations and serving their citizens" [11, p. 1]. Digital Governance has an aim to achieve transformation of government towards more responsive public services and processes [12]. While Digital Governance has a clear focus on the public sector deploying digital technologies to deliver public services, make public processes more efficient and effective or use data and algorithms to address societal challenges and improve (data-driven) policy making [13], GovTech focuses more explicitly on the technology and its development, deployment and maintenance itself [2]. Especially the notion of 'hidden interdependencies' is of importance, which implies that ecosystems emerge in which multiple organizations collaborate to develop, deploy and maintain a specific technology [2]. Consider for instance the use of citizen identifiers or access to data stored in public registries by private parties. At the same time, public agencies can also attain goals like personalized public services or personal data management by allowing data wallets or algorithms developed by private parties.

Innovation Ecosystems literature sheds a different light on the interdependencies created by GovTech. Innovation ecosystems can be defined as "the collaborative effort of a diverse set of actors towards innovation, as suppliers deliver key components and technologies, various organizations provide complementary products and services, and customers build demand and capabilities" [14, p. 18]. Adner and Kapoor [15] state that the success of innovative companies depends on the efforts of other innovators in their environment, and that there is a certain interdependence between actors in innovation ecosystems. An important role is, therefore,

Table 1: Overview of conducted interviews

Country	Respondent role	Type of role in the ecosystem
Netherlands	Advisor at ICTU and Digicampus	Convener: Orchestrator
Netherlands	Innovation Manager Ministry of Interior and Kingdom Relations	Convener: Orchestrator and initiator
Netherlands	Program Manager Municipality of The Hague	Convener: Orchestrator and initiator
Netherlands	Chief Technology Officer at a start-up	Participant
Netherlands	Senior advisor PIANOo Dutch public procurement expertise centre	Participant
Lithuania	Manager GovTech Lab Lithuania	Convener: Orchestrator and initiator
Lithuania	Director of Panavezys Now (Lithuanian Economic Development Agency)	Convener: Orchestrator and initiator
Lithuania	General Manager of Invest Lithuania and co-founder of GovTech Lab Lithuania	Participant
Lithuania	Co-founder at a start-up	Participant

for the convening actor in an ecosystem or collaboration, playing a central role in initiating and coordinating these ecosystems [16].

Within these innovation ecosystems there is also a role for the government. According to Rinkinen and Harmaakorpi [17], governments can stimulate the development of innovation ecosystems via public procurement mechanisms and policies. Mergel et. al [7] argue that in order to be able to make use of the full potential of GovTech, it is of importance to understand the role of public procurement, and innovate these procurement practices. Obwegeser and Müller [18] developed a taxonomy for the link between public procurement and innovation. The first category is public procurement for innovation, focused on how public procurement can drive innovation. The second category is public procurement of innovation, focused on how public services can be innovated. The third category is innovative public procurement, focused on how public institutions can procure innovatively [18]. While the procurement of GovTech is part of the first and second category, is the third category about improvement of the current procurement process [2].

Building on these two bodies of literature, our study aims to explore the emergence and development of GovTech ecosystems, in particular focusing on barriers and success factors. To start this exploration, we adapt the GovTech ecosystem definition of Hoekstra et al. [5]: "networks of citizens, public and private actors [..], academia, and (venture) capital involved in the development of technological solutions to address public challenges" [p. 16].

3 METHODOLOGY

Since GovTech is a new phenomenon and only few academic studies are available, this study applied an exploratory research approach. The advantage of applying an exploratory case study approach is that it allows gaining a better understanding of a particular phenomenon and can provide more insight into complex situations [19]. Therefore, this study conducts an exploratory comparative case study of the development of GovTech ecosystems in the Netherlands and Lithuania. To select these case studies we were interested to examine two countries that play a leading role in the European GovTech ecosystem, which allows us to learn from these still early stage developments. The World Bank GovTech Maturity Index identified both countries as frontrunners in GovTech [6].

Expert interviews were the main method used for data collection, in combination with desk research of background information, for example policy documents on the development of GovTech ecosystems. In December 2022 and January 2023 a total of nine online interviews of approximately one hour took place. For each case study different roles were interviewed: conveners, such as the orchestrators and founders of the GovTech ecosystems, and participants in the ecosystem. We selected the respondents based on their role and position within both GovTech ecosystems. Since GovTech is a very new concept, these are the people that play a central role in the development and emergence of the GovTech ecosystems in their country. We interviewed five respondents in the Netherlands and four respondents in Lithuania.

The semi-structured interview protocol was established by taking into account information gathered in the literature review. Since GovTech builds on digital governance and innovation ecosystems literature, we use these perspectives as a theoretical lens for exploring GovTech ecosystems. The protocol included questions about the background and GovTech experience of the interviewee, their perspective on the most important objectives of GovTech, the emergence of a GovTech ecosystem in their country, elements of a successful GovTech ecosystem, barriers regarding the emergence of the GovTech ecosystem in their country and the role of public procurement. To examine the interview results, the following steps were undertaken in coding the data. First the interview transcripts were analyzed and codes were assigned inductively (open coding) [20]. Subsequently, we put the codes into categories. Based on these codes we identified common themes. The results are presented in the next section.

4 RESULTS: CASE STUDY OF THE GOVTECH ECOSYSTEM IN THE NETHERLANDS

4.1 Background: Emergence of GovTech ecosystem

The GovTech ecosystem in the Netherlands is relatively new and still under development. However, some interviewees also indicate that some key elements were already in place before the term GovTech emerged. For example, specific programs were already in place for procuring innovative products. According to interviewees, within the Dutch GovTech ecosystem, many public sector and private sector actors are active, although initiatives are scattered and not all actors are connected. The organization of GovTech Summits in 2021 and 2022 in the Netherlands helped to connect these actors. Currently, several initiatives exist that stimulate the development of the Dutch GovTech ecosystem. For example, *Digicampus*, a quadruple helix innovation partnership with a specific focus on human centric public service innovation, organizes multiple activities to build and guide innovation collaborations between public sector organizations, GovTech developers and researchers [5]. An example is the GovTech Validation Lab: throughout nine weeks, start-ups get the opportunity to test and validate their GovTech product by collaborating with a potential government client, end users and other relevant stakeholders [21]. Another example is transfer of GovTech topics and challenges to academic research projects, stimulating students to work on GovTech related topics or even valorize ideas into potential new start-up ventures.

4.2 Definition and characteristics of GovTech

One of the main observations from the interviews is that all of the Dutch interviewees have a different interpretation of what GovTech entails, ranging from who developers are, to what type of technology it concerns. Although it is clear to all interviewees that GovTech has a strong digital component, one interviewee also considers GovTech as the broader use of technology by governments: "*People have the tendency to have a narrow definition of GovTech, but technology does not always need to be digital.*" However, there are some common elements that can be identified. For example, an interviewee mentions the following about the goal of GovTech: "*the goal is that with technology you realize a better functioning government.*" Dutch interviewees also notice that currently within the GovTech ecosystem and Dutch government there is a lot of attention to ensuring that GovTech and service delivery of government is human centric and that public values are sufficiently taken into account. Furthermore, related to this human centric approach, all interviewees mention that GovTech is about a new way of collaboration between the government and private sector. Instead of the traditional form of procurement relationship between client (public sector organization) and contractor (private sector organization), there is more focus on co-creation between public sector actors and private sector actors, while also including relevant societal stakeholders in this co-creation process: "*It is about a new form of collaboration, not just government and entrepreneurs, but also with society*".

4.3 Success factors

Interviewees mention a number of factors that contribute to a successful GovTech ecosystem. First of all, it is important to have public-private collaborations that are focused on a specific topic. In these collaborations, it is key to be able to share knowledge and lessons learned. Furthermore, there should be political support and commitment of ecosystem actors to support the development of the ecosystem. Interviewees also see an important role for the government in the GovTech ecosystem: "*The government also plays a role in this. Next to procurement, they are actively stimulating networks.*" For example, initiatives that connect public sector organizations with innovative companies are considered as very useful by interviewees. In addition, the culture of innovation and attitude towards technology are important factors for success. One interviewee underlines the importance of a space for experimentation: "*within the public sector we are used to succeed in one attempt, but with innovation this is often not possible [..] there is no space for real innovation. We need a sandbox or a hub, [..] a space that is physical or digital where civil servants can collaborate with entrepreneurs and innovators.*" Other factors that are mentioned are the role of standardization, laws and regulations, where interviewees call for a harmonization of standards and law and regulations that is future proof.

4.4 Barriers

The interviewees also see some GovTech specific barriers regarding the development of GovTech. At this moment, there are several 'islands' in the Dutch GovTech ecosystem; it is not yet a connected ecosystem with a free flow of information. In addition, interviewees mention that government and private sector actors have a different pace and way of working, and that the pace of the government can be considered too slow for a start-up or scale-up. Another barrier that interviewees mention is the lack of technical and market knowledge of civil servants, which can make it difficult for civil servants to formulate the right question for the market. One interviewee underlines the importance of market interaction: "*interaction with the market is important before a question is formulated.*" In addition, there is fragmentation of knowledge and fragmented development of technology within the ecosystem. According to one interviewee: "*every municipality is working on a digital twin,*" whereas this development may also take place in a more collaborative manner. Finally, it is of importance to have sufficient attention for organizational embedding of GovTech applications: "*You also see that if there is a prestigious assignment, there is a very big team, but once the assignment has been procured, the team from the government side is slimmed down. Interaction between government and market party is important. And the interaction with colleagues. This requires organizational embedding. Successful projects are large projects with dedicated project managers.*"

4.5 Role of public procurement

While some regard procurement as a requirement for GovTech ecosystems: "*procurement is a condition for GovTech,*" others state that a new form of collaboration between public and private sector has an impact on traditional procurement process and that a shift is necessary to innovative methods of public procurement that stimulate co-creation. Interviewees expect that the use of the public

procurement framework will change due to new forms of collaboration between public and private actors and they, therefore, regard public procurement as a barrier for the development of GovTech. One interviewee mentions: "*Legal experts with a focus on innovation state that procuring innovative technologies is possible within the current procurement framework, but that it is difficult to realize this.*" The barrier is not the procurement framework in itself, but the actual use and knowledge of what is possible within the current procurement framework: "*procurement instruments are much richer and bigger and has more potential than people currently think. There are a lot of good instruments that are not also utilized.*"

Pre-procurement is also considered to be an important step in the process, since this is the phase where the criteria and specifications of the product are laid out. A successful example of how public sector organizations can collaborate, is the 'Buyers' group' on 'AI image recognition with the use of drones' that the Dutch AI Coalition and PIANOo Dutch public procurement expertise centre set up [22]. "*This 'Buyers' group' consists of a group of public sector organizations that have a common question and would like to procure a similar product. Together they determine the criteria of the product that they want to procure. As a result they are able to show to the market in a consistent manner what type of product they would like to buy and which criteria the product should have.*" The advantage of this group is that they present similar and predictable criteria to the market.

5 RESULTS: CASE STUDY OF THE GOVTECH ECOSYSTEM IN LITHUANIA

5.1 Background: Emergence of GovTech

All Lithuanian interviewees underline the important driving force and convener role that GovTech Lab Lithuania took on in the creation and development of the GovTech ecosystem in Lithuania. GovTech Lab Lithuania originated from the talent program Create Lithuania and was established in 2019 by the Ministry of Economy and Innovation. One of the interviewees described the motivation to establish GovTech Lab Lithuania as follows: "*the government had a very slow and different way of working. We realized that we won't be able to achieve [digital transformation] if we continue doing what we are doing. [. . .] We realized that the main driver is start-ups [...], but we had no forms or relationships of the government with start-ups. This was the tipping point where the GovTech Lab could be the place where we can bring real-life problems from the public sector and call on start-ups to solve them.*" As a result, the main goal of GovTech Lab Lithuania became to connect public sector organizations with innovative companies.

GovTech Lab Lithuania organizes activities such as challenges and trainings and builds the GovTech network via the organization of events. An important activity is the GovTech challenge series which is a program in which public sector institutions can submit a challenge: a problem they would like to find a solution for. In 2021, GovTech Lab Lithuania organized fifty of such challenges. Another activity organized by GovTech Lab Lithuania is the Accelerator program, in which companies can participate to prepare for their participation in the GovTech Lab challenge series. The accelerator provides companies the opportunity to attend free consultations on several topics such as business development and public procurement. An interviewee working at a start-up stated: "*The accelerator was really good because essentially they asked us what we needed and based on our specific requirements they were able to connect us to people that were able to help us. [..] The support from GovTech Lab gave us a lot of credibility.*" Although GovTech Lab Lithuania is the linking pin and at the core of the GovTech ecosystem, other important players are Start-up Lithuania, unicorn association, the association of IT companies, public sector organisations that participate in the activities organized by GovTech Lab Lithuania and start-ups and IT companies. However, most of the focus of GovTech Lab Lithuania is currently on developing the public sector part of the GovTech ecosystem.

5.2 Definition and characteristics

When Lithuanian interviewees were asked about their interpretation of GovTech they mentioned a couple of characteristics. One interviewee summarized: "*GovTech from the technology point of view is emerging technologies. Emerging technologies are those technologies that are not yet proved to be business as usual. This is the way that you can test them [..] for us GovTech is the real-life public sector challenges solved with start-ups and emerging technologies. And so the ecosystem is all the participants into this journey, from direct receivers and developers to stakeholders around us.*" Another characteristic is that GovTech is also about new forms of collaboration and about breaking silos. One interviewee mentioned: "*In the past, every institution was focused on their own functions, now they understand that getting more partners makes you more productive and more efficient. So GovTech is actually destroying those boundaries by connecting a network of different partners.*"

5.3 Success factors

The interviewees mentioned a number of important factors in order for the GovTech ecosystem to be successful. First of all, one interviewee underlined that there needs to be a clear strategy and vision of the ecosystem. Furthermore, there needs to be a driving force, facilitator and leader present within the ecosystem. Interviewees perceive GovTech Lab Lithuania as a facilitator between two different worlds, between public sector and private sector, while at the same time being a leader and driving force behind the whole ecosystem. In addition, the ecosystem needs to be an open innovation ecosystem, with an open community, that is open to sharing knowledge. One element of this is that the ecosystem needs to be vibrant and active with events and gatherings. This requires a culture of co-creation and innovation. On the public sector side this means that civil servants are open to change and to adapt new innovative ways of working. One interviewee stated: "*we see that it depends on enthusiasts that work inside the institutions and where they want to focus on.*" Another key factor for success is skills, expertise and capabilities. In order to further develop and scale up the GovTech ecosystem in Lithuania, GovTech Lab Lithuania focusses on investing in developing skills, expertise and capabilities of the public sector part of the ecosystem. More specifically, they focus on mid-level managers that want to start innovation projects: "*if we have a public sector that is capable of telling about those challenges to the market and then buying from the market solutions, the rest*

will follow. If we focus just on strengthening start-ups and companies, there is a lot of mismatched expectations, if you have strong companies but the public sector is not able to buy it, it can set you back a few years."

5.4 Barriers

The interviewees also mention a number of barriers. An important barrier is the lack of skills, knowledge and expertise of civil servants. This means that civil servants and private sector organizations do not always speak the same language due to a different level of technical expertise. An interviewee working at a start-up stated: "*For us GovTech was a way to insert technology into governmental processes to make it more efficient, accessible and inclusive. But in reality we ended up with more of an education related role where we were trying to explain the importance of using new technologies, the importance of interacting and engaging with citizens outside the election time.*" GovTech Lab Lithuania is currently therefore also more focused on strengthening skills and capabilities of the public sector. However, because of this focus of GovTech Lab Lithuania, there is currently less interaction between public and private sector organizations. One of the interviewees, a civil servant and participant in the GovTech challenge series noticed this as well and would like to see more interaction: "*what I am missing in this ecosystem is [..] I don't see the businesses, the start-ups, the companies. They are somewhere out there, but we don't get to know them that often or that well. That would be helpful to know how they view GovTech, how much they are interested in working with the public sector, what kind of solutions they are developing.*"

In addition, public sector organizations often have limited capacity and resources to invest in innovative solutions. GovTech Lab Lithuania tries to overcome this barrier by funding the challenges, however these funds are only available for the duration of project. Moreover, for specific GovTech applications, the GovTech ecosystem might not be large enough for start-ups solely working for the public sector. An interviewee working at a GovTech start-up with a specific focus on citizen engagement mentioned that their start-up was initially solely focused on the public sector, but that they recently decided to also broaden their scope by focusing on commercial companies to survive financially as a start-up: "*we decided to move it to private sector where we were able to do proper sales and actually make money of our creation and work on it fulltime.*"

5.5 Role of public procurement

Interviewees have different opinions on the current public procurement framework. Some regard it as a challenge, but one interviewee does not regard it as such: "*I think that it is less the public procurement itself, but the ways that people are using it.*" Interviewees expect that the way that people will use the public procurement will change due to new forms of collaboration between public and private actors. A new innovative public procurement method that can change the use of the public procurement framework is the design contest method. As part of the GovTech challenge series, GovTech Lab Lithuania applies this method, which is aimed at giving innovative companies the opportunity to solve a challenge posed by a public sector organization within a given timeframe. The advantage of this method is that civil servants do not need to determine the solution themselves, they only need to describe the results that they would like to achieve. In this way the private sector can help the public sector by finding the best solutions. One interviewee stated the following on the impact of GovTech Lab Lithuania on innovative public procurement: *"GovTech Lab Lithuania made a major breakthrough when it comes to innovative purchases. In the past, in 2019 [..] only two purchases were classified as innovation purchases. [..] When the GovTech lab was in the driving seat, driving this bus and taking everyone on board for the innovation purchases, the next year it was already fifty innovative purchases. This opened up this new understanding that it is not so scary and not as difficult as it looked like."*

6 FINDINGS AND DISCUSSION

Based on the explorative cases in The Netherlands and Lithuania, our findings contribute to understanding GovTech ecosystems in two ways. Firstly, we present findings on the emergence of GovTech ecosystems as well as compare the emergence of two different GovTech ecosystems in two different countries. Secondly, we contribute to literature on the conceptualization and the emergence of GovTech in general. Finally, and more specifically, we do this by investigating success factors and barriers for the emergence of GovTech ecosystems. Table 2 presents an overview of the key elements identified in both cases.

Regarding the emergence of GovTech ecosystems, we find that both ecosystems are relatively new and still under development. However, some elements of the ecosystem in the Netherlands, such as innovative procurement, is not new at all and were in place even before the emergence of the GovTech concept. Yet, there is more attention to procurement criteria because many GovTech start-ups and scale-ups are not able to satisfy these criteria. We also found that the way in which the two GovTech ecosystems emerged and are built up, differs. Whereas GovTech Lab Lithuania can be regarded as the convener [16] and driving force behind the ecosystem in Lithuania, the ecosystem in the Netherlands is scattered: several 'islands', 'conveners' (such as Digicampus) and initiatives exist. Events such as the organization of the GovTech Summit in the Netherlands do help in bringing these islands together under the banner of GovTech NL.

Furthermore, based on these case studies, we do not find a common interpretation of the GovTech concept. Nevertheless, we do identify a couple of common characteristics. First, GovTech is about new forms of collaboration between public and private sector organizations. Second, GovTech is about improving and innovating the functioning of government and delivery of services by government. Third, public procurement is a central element. Furthermore, Dutch interviewees underline the attention to human centric GovTech and the importance of taking public values into account in the development of GovTech. This fits with the citizen-centric definition of the World Bank [6] and the Digital Governance stream of literature [11]. The Lithuanian interviewees underline the potential transformational objective of GovTech, fitting with other objectives based on Digital Governance literature [12]. Therefore, we find that it is useful to look into both literature streams of Digital Governance and of Innovation Ecosystems to look for further exploration of GovTech ecosystems.

Table 2: Key results case studies

Key results case studies	GovTech ecosystem in the Netherlands	GovTech ecosystem in Lithuania
Emergence of GovTech	Some key elements were already in place before the term GovTech emerged; initiatives are scattered and not all actors are connected.	Centralized GovTech ecosystem; GovTech Lab Lithuania has a convener role and is a driving force behind the creation and development of the GovTech ecosystem
Definition and characteristics of GovTech	No common definition of GovTech. Some common characteristics: GovTech has a strong digital component and is about a new way of collaboration between government and private sector. Co-creation is central.	GovTech is about emerging technologies and new forms of collaboration.
Key success factors	Public – private collaborations; knowledge sharing; political support and commitment of ecosystem actors; role of government; culture of innovation and attitude towards technology; space for experimentation; harmonization of standards; future proof law and regulations.	Public-private collaborations; knowledge sharing; clear strategy and vision of the ecosystem; presence of a driving force, facilitator and leader; culture of co-creation and innovation.
Key barriers	Many islands in the Dutch GovTech ecosystem; no connected ecosystem yet; different pace and way of working by private sector actors and government; civil servants lack technical and market knowledge; fragmentation of knowledge and fragmented development of technology within the ecosystem; organizational embedding of GovTech applications.	Lack of skills, knowledge and expertise of civil servants; civil servants and private actors do not always speak the same language due to a different level of technical expertise; limited capacity and resources to invest in innovative solutions; GovTech ecosystem and market is not large enough for start-ups solely working for the public sector.
Role of public procurement	GovTech stimulates innovative methods of public procurement. Use of public procurement framework will change due to new forms of collaboration between public and private actors.	Use of public procurement framework will change due to new forms of collaboration between public and private actors.

When it comes to the role of public procurement, interviewees indicate that the procurement framework in itself is not a barrier, but that the combination of GovTech requires a different and more innovative utilization of the procurement framework, while at the same time people often do not know what the possibilities are of the current framework. Both the GovTech validation lab of Digicampus and PIANOo's 'Buyers' group' in the Netherlands, and the challenge series organized by GovTech Lab Lithuania are examples of Obwegeser and Müller's [18] second category of public procurement of innovation, focused on how public services can be innovated with the use of GovTech. These examples illustrate how the traditional public procurement framework can be used in a different manner to adapt to the new form of collaboration that GovTech requires.

Table 3 presents an overview of success factors and barriers identified in the case studies. A number of factors for success that contribute to ecosystems were mentioned by interviewees, such as public-private collaborations, having a clear vision and strategy, sufficient space for experimentation, having infrastructure, networks and initiatives in place that stimulate sharing of knowledge and resources, and the presence of a culture of co-creation and innovation. In order for this new form of collaboration between public and private sector organizations to fully thrive, some barriers need to be overcome. Barriers often mentioned were skills, knowledge and expertise of ecosystem actors, and more specifically of civil servants. For example, in Lithuania we see that the skills and capabilities of the public sector do not always match the needs and expectations of the private sector. In order for real co-creation to be able to take place the public sector needs to be an equal knowledge partner of the private sector. GovTech ecosystem building will also require strengthening the absorptive capacity of public agencies. Trainings and sharing of resources and lessons learned may help to overcome this barrier. In the case of Lithuania, convener GovTech Lab Lithuania plays an important role in trying to overcome these barriers, confirming the important role of a convener for ecosystem building [16]. Regarding barriers, we find that barriers such as a lack of skills, knowledge and expertise of civil servants as well as the lack of a common language between the public and the private sector indeed justify the focus on GovTech as an emerging concept.

We recommend further research to explore key elements of the literature streams of Digital Governance and of Innovation Ecosystems when researching GovTech. In addition, to validate the identified success factors and barriers in this study, we recommend future research to conduct more case studies in other countries. Moreover, we recommend further research to focus on the role of public procurement in GovTech, since there currently is not much research available in the literature on this topic and because our findings show that a different use of the public procurement framework is needed to fully accelerate the development of GovTech.

Table 3: Identified success factors and barriers in case studies

	Netherlands	Lithuania
Success factors		
Public – private collaborations	X	X
Knowledge sharing	X	X
Political support and commitment of ecosystem actors to support the development of the ecosystem	X	
Clear strategy and vision		X
Presence of a driving force, facilitator and leader		X
Role of government within the ecosystem	X	
Initiatives that connect public sector organizations with private companies	X	
Culture of co-creation and innovation	X	X
Space for experimentation	X	
Harmonization of standards	X	
Future proof law and regulations	X	
Barriers		
No connected ecosystem yet, initiatives are scattered	X	
Different pace and way of working by private sector actors and government	X	
Lack of skills, knowledge and expertise of civil servants	X	X
Fragmentation of knowledge and fragmented development of technology within the ecosystem	X	
Limited capacity and resources to invest in innovative solutions		X
Organizational embedding of GovTech applications	X	
GovTech ecosystem and market is not large enough for start-ups solely working for the public sector		X

7 CONCLUSION

Since GovTech is a relatively new concept, academic literature on GovTech and GovTech ecosystems is still scare, and empirical studies into the emergence and impact of GovTech ecosystems are even scarcer. To address this gap, this study conducted an explorative case study of the emergence of the GovTech ecosystems in the Netherlands and Lithuania. The contribution of this study is twofold. First, we find that there is currently no conceptual clarification of the GovTech concept yet, but using the bodies of literature of Digital Governance and Innovation Ecosystems help to shed light on this concept. Also, based on the case studies, we do identify some common characteristics: Firstly, GovTech is about new forms of collaboration between public and private actors. Secondly, it is about improving and innovating the functioning of government and delivery of services by government with the use of digital technology. And thirdly, public procurement plays an important role, either as a facilitator or as a barrier. The second element is rooted in the Digital Governance literature, whereas the first and third element builds on the Innovation Ecosystems body of literature.

Second, we contribute to the understanding of the emergence of GovTech ecosystems. Specifically, the central research question of this study was: what are the barriers and success factors for the emergence of GovTech ecosystems? Regarding success factors we find that, among others, GovTech ecosystems require new forms of collaboration between public and private actors and a culture of innovation and co-creation. However, in order for these success factors to fully thrive some barriers need to be overcome. We found that there are some common barriers with traditional innovation ecosystems, but that there are also some GovTech specific barriers such as insufficient knowledge, skills and capabilities regarding working with new technologies within public sector organizations and a complex public procurement framework. GovTech ecosystem building will also require strengthening the absorptive capacity of public agencies. Since there is currently not much research available about the role of public procurement in GovTech, and our

findings show that a different use of the public procurement framework is needed to fully accelerate the development of GovTech, we recommend future research to focus on this.

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