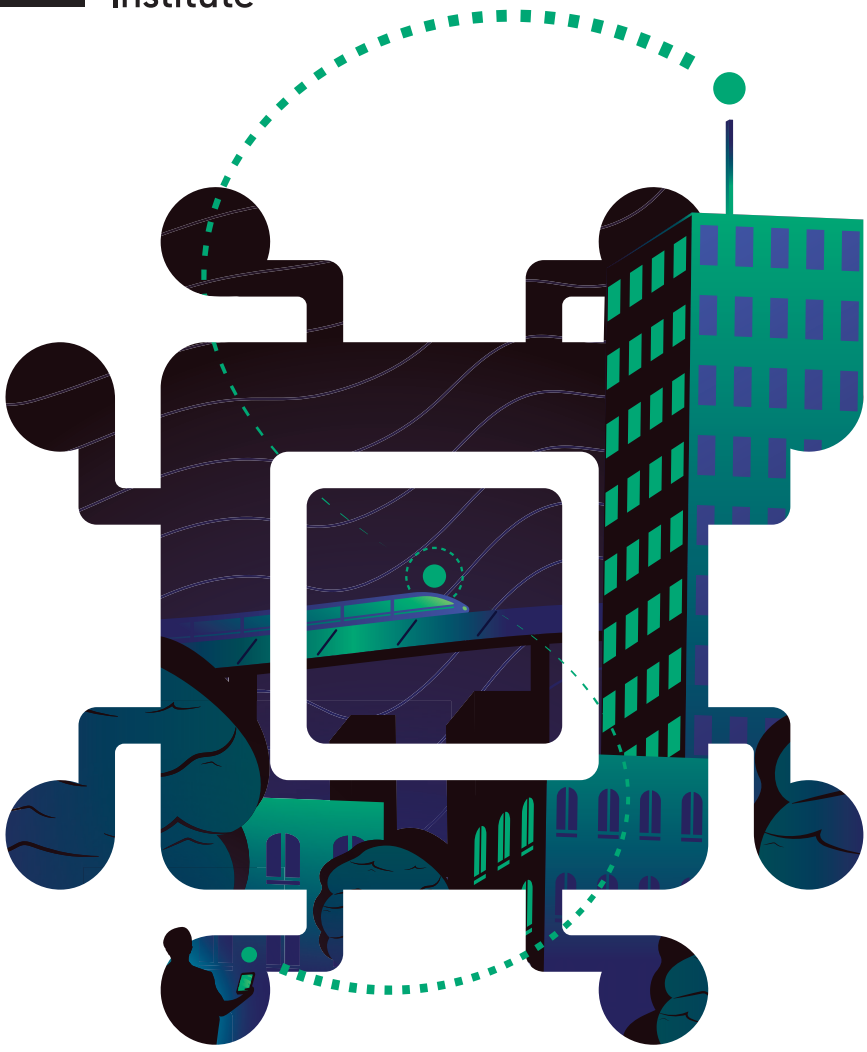
Polish Economic Institute



GovTech – new technology in the public sector

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2164	Number of public contracts in ICT in Poland in 2017
43%	Percentage of public contracts for which just one offer was submitted in 2017
14%	Success rate of IT projects implemented using waterfall methodology
42%	Success rate of IT projects implemented using agile methodology

Key findings

Monopolisation costs governments millions. The traditional model of public procurement is not working as an instrument of cooperation between the public sector and businesses when it comes to orders of ICT services. Worldwide, these ordered are being monopolised by big corporations. As competition declines, prices rise and public institutions struggle to obtain the technological projects they need. This problem affects Poland. According to the chairman of the Public Procurement Office, in 43% of public orders in 2017, just one offer was submitted (Ministry of Entrepreneurship and Technology [MPiT]; 2018). The difficulties linked to obtaining and implementing IT solutions are illustrated by the example of extending the Central Register of Vehicles and Drivers (Centralna Ewidencja Pojazdów i Kierowców [CEPiK]) system in Poland. The changes were carried out with significant delay and cost PLN 42 m more than assumed. In the United States, the Healthcare.gov website is an example of problems when ordering ICT services. Although it cost over a billion złoty, for a long time, the website was unable to fulfil its function.

GovTech will reduce mismanagement in public finances. The development of GovTech initiatives (broadly understood) in many developed countries is a response to the losses resulting from the ineffective realisation of public contracts in ICT. They concern both the procedural sphere, i.e. the optimisation of the administration's operations, and the institutional one, realised by establishing government agency that support the process of the public administration obtaining ICT services. Poland's response for that challenge is the GovTech Polska project launched in 2018. Using best practices from abroad, Poland wants to implement further functions improving the process of providing cheaper, innovative and better-fitting ICT solutions for the administration.

What is GovTech and how much is it worth. GovTech is a dynamically developing segment in the IT market focused on the supply of innovative digital services and solutions for the public administration by the private sector. The global market is worth an estimated USD 400 bn. In Europe alone, spending on GovTech amounts to around USD 25 bn. Britain invests the most in GovTech in Europe; in 2015, the GovTech market there was worth GBP 6.6 bn. By 2025, this is expected to have tripled.

GovTech improves the quality of services provided to citizens. GovTech solutions are applied in many fields of the public administration. Most GovTech projects concern organisation within the administration (such as cybersecurity or the organisation of work) and the provision of public services (transport, healthcare, media and administrative services). Even when GovTech actions concern the organisation of work in the public administration, the ultimate effect – in the form of improved operations – translates into better-quality services for citizens.

The benefits of GovTech. For political decision-makers, GovTech is an opportunity to increase productivity, create jobs and speed up the pace of economic growth. For the administration, GovTech offers cheaper, easier access to better solutions. For start-ups, it is a growing market providing numerous opportunities to develop and deliver solutions, as well as gain experience valued by other clients. Investors note the growing potential for investment in GovTech. An advantage of involving business in the GovTech sector is the high solvency of

potential clients (the public administration). A flaw is the need to adapt the mode of activity to requirements specified by the procedures of the law on public procurement.

The public procurement process requires improvement. Governments in individual countries are adopting numerous solutions improving the process of public contracts when it comes to ICT. They are either remedial, seeking to make existing procedures more efficient, or innovative, involving the implementation of new procedures and practices. The make order procedures more efficient by increasing the administration's knowledge of the technology available on the market and stimulating activity among SMEs. Moving away from public procurement based on the waterfall methodology, towards competitions based on agile methodology, is a key. ICT projects carried out using them are three times more likely to be successful than when traditional procedures are used (42% and 14% respectively).

Recommendations for Poland. Poland is taking steps to digitise the administration and modernise the public sphere. This is being done through a series of initiatives, including:

1. Increasing SMEs' interest in providing ICT tools for the administration, including through increasing the use of competitions for obtaining innovative ICT solutions for the administration and using tools to help the administration find potential providers among smaller businesses.
2. Simplifying and automating orders available on the application market by implementing a solution in Poland modelled on the Digital Marketplace platforms that exist in Britain and Australia.
3. Creating a business and investment base for the Polish GovTech market by engaging institutionalised investors with the necessary competencies when it comes to products and services for the administration and providing them with a friendly path for cooperating with the public sector.
4. Streamlining the process of commercialising the solutions developed on new markets by establishing partnerships with developing countries, helping them build their own organisations for supporting the development of the GovTech sector and organising competitions for developing the functionalities that they are looking for.
5. Facilitating the exchange of knowledge and experience concerning GovTech products implemented in developed countries by involving GovTech in the creation of an international ecosystem of similar organisations.

Introduction

This report provides an overview of the steps concerning GovTech taken by selected countries, with a focus on the provision of ICT services for the public sector. It summarises the effects of the GovTech Polska so far and presents recommendations on how it should develop.

Public procurement in Poland is currently worth over PLN 163 bn (Public Procurment Office, Urząd Zamówień Publicznych, 2018, p. 9). Data in the reports submitted to the Chairman of the Public Procurement Office shows that there were 139,133 orders in 2017. Around 25% of spending on orders concerned services (excluding construction work) and 31% deliveries. In 2017, there were 2164 ICT deliveries[1]; 1.55% of all orders (Suteniec, 2018). Just a small percentage of them were carried out by SME's[2]. According to the Chairman of the Public Procurement Office, in 43% of public orders just one offer was submitted (Ministry of Entrepreneurship and Technology – MPiT) (Ministry of Entrepreneurship and Technology, 2018). Falling competitiveness leads to higher prices and lower-quality solutions. Examples of the serious consequences of the limited diversity of offers and products' maladjustment to foreseen tasks include:

→ **The computerisation of Poland's local elections in 2014**

The tender organised by the National Electoral Commission was won by the only applicant, which lacked the experience and resources for the project. No-one else applied because the requirements were not adjusted to market realities. The programme purchased malfunctioned and was insufficiently protected. A check by the Supreme Chamber of Audit (Najwyższa Izba Kontroli – NIK) found that PLN 429,300 was wastefully spent on the IT system for the local elections (Najwyższa Izba Kontroli, 2015, p. 12).

→ **Extending the functionality of CEPiK's IT system**

The purchase of the IT system for the Central Register of Vehicles and Drivers (CEPiK) is an example of problems with ordering ICT services. The NIK check found that "CEPIK 2.0 was not properly prepared, both during the management of the project by the Ministry of the Interior and the Ministry of Digital Affairs, which led to the term for all its functionalities being extended by more than two years and increased implementation costs by PLN 42 m. After the launch of parts of the CEPiK 2.0 system for vehicle registration in November 2017, citizens and the authorities faced numerous difficulties, indicating that needs in this area were not met the right way" (Najwyższa Izba Kontroli, 2018, p. 7).

[1] ICT – technology that allows the electronic recording, processing, transmission, playback or reproduction of information.

[2] SMEs – the acronym for micro, small and medium-sized enterprises. There were about 2 m of them in Poland in 2016 (99.8% of all enterprises). A micro-enterprise has fewer than 10 employees (a small one has fewer than 50 and a medium-sized one fewer than 250), with an annual turnover and/or total annual balance up to EUR 2 m (for small ones: up to EUR 10 m, for medium-sized ones: up to EUR 43 m).

→ **Planning and implementation of the e-police station project**

The requirements for this ICT tool and the conditions for its incorporation into police practice were not duly elaborated. The order for PLN 20 m was prepared with a delay and the product did not meet policemen's needs. The Police Management did not have sufficient knowledge of the financial, legal and technical possibilities needed to fully implement the ICT tool purchased (Najwyższa Izba Kontroli, 2013, p. 8).

Problems linked to maladjustment of the conventional institutions of the law on public procurement to ICT orders are not limited to Poland. The monopolisation of public orders for ICT by big corporations and public bodies' difficulty obtaining technological products that meet their needs is visible in a series of developed countries. According to a report by the Institute for Government, since 2000 over GBP 10 bn has been spent on ICT projects for the British administration that did not meet expectations. Unsuccessful projects carried out using conventional procurement procedures include the e-borders project, the electronic patient card and Universal Credit (Andrews et al., 2016, p. 2). In the US, there was Healthcare.gov, which cost the equivalent of over a billion złoty, but was unable to fulfil its functions for a long time (Filer, 2019, p. 14).

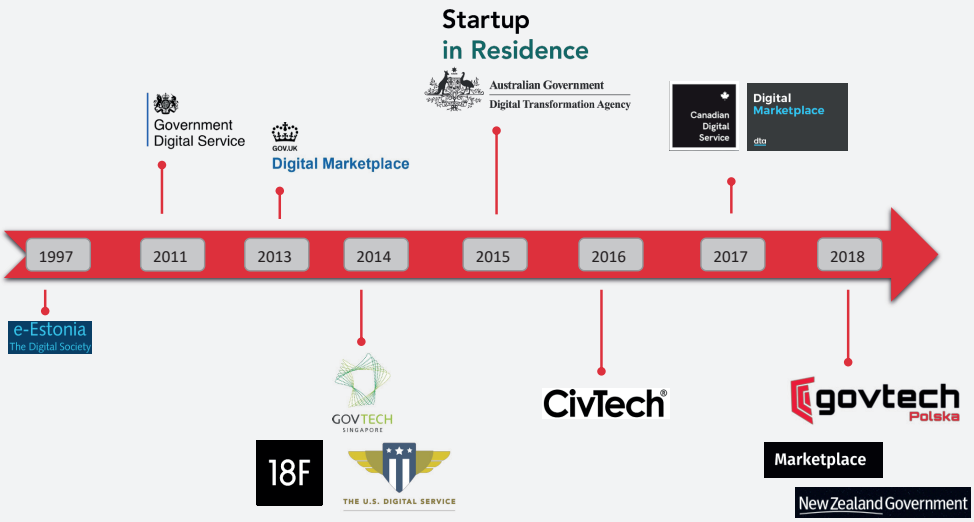
> *The UK Government spends more on ICT [per capita] than any other government. And yet the history of UK government ICT projects is littered with budget overruns, delays and functional failures.*
>
> Francis Maude, now British Minister for the Cabinet Office with responsibility for public sector efficiency and reform, London, 5/10/2009 (National Audit Office, 2011, p. 20)

> *For years the state of California has been running multi-annual and multi-million IT projects, only to realize that many of them do not bring the intended results – planning and implementing these projects takes more time and generate more costs than is usually expected. Customers have one consistent thing they tell us: You gave me what I asked for, but it is not really what I wanted.*
>
> Peter Kelly, deputy director at the system integration office at one of the Californian agencies (as cited in Raths 2017)

A response to these imperfections is the development of GovTech initiatives, broadly understood, in a series of developed countries. They concern both the procedural sphere – that is, the optimization of administrative and institutional procedures – and the institutional one, which involves establishing government agencies supporting the process of the public administration obtaining ICT services. The first such initiative was the establishment of the Government Digital Service in Britain in 2011 (GDS;Andrews et al., 2016, p. 3). Other countries followed suit, including

the US (with the US Digital Service in place since 2014; United States Digital Services, 2019 and the F18 agency; GGovTech.com, 2016), Australia (with the Digital Transformation Agency in place since 2015; The Senate of Australian Parliament, Finance and Public Administration References Committee, 2018) and Canada (the Ontario Digital Service of 2011 and the Canadian Digital Service established in 2017; Clarke, 2017, p. 7).

↘ Diagram 1. Development of GovTech initiatives

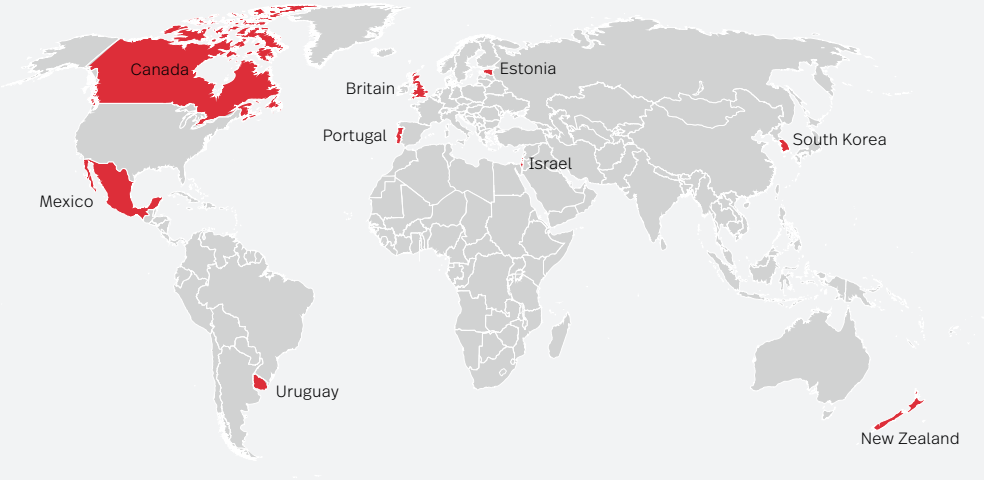


Source: prepared by the authors.

In addition to changes in domestic regulations and application of the provisions of public procurement law, GovTech units are involved in programmes for exchanging knowledge and best practice. In 2014, on Britain's initiative, the "D5" network of the world's most digitally advanced states was established. Its other members are New Zealand, Estonia, Israel and South Korea; in 2018, Canada, Uruguay, Portugal and Mexico joined it, resulting in the "D9" (OECD, 2019a, p. 95). The agreement's aim is to open the market of services for the administration to smaller enterprises by modernising the public procurement process and exchanging states' experience (D7 New Zealand, 2019, p. 1).

Poland's response to the public administration's problems is the **GovTech Polska** project launched in 2018. Using best practices from abroad, Poland wants to implement new ways to streamline the process of delivering cheaper, more innovative and better suited ICT solutions for the administration.

↘ Illustration 1. The “D9” network’s members



Source: prepared by the authors.

The GovTech market

What is GovTech?

GovTech is an acronym of Government Technology. Widely used in the US and Africa, the term did not gain global popularity until recent years (Elliott, 2018a). Understood in various ways, the term usually means modern IT solutions for the public administration (Desmond, Kotecha, 2017, p. 7).

> **GovTech** is modern ICT solutions for the public administration.

New Zealand organisation GovTech World notes that GovTech is a rapidly developing segment of the market focused on the private sector providing digital solutions, data processing and modern technology for improving the state's functions in society for the public administration (Little, 2018). According to PwC, GovTech consists in actions aiming to break through the administration's existing practices, involving innovative companies delivering modern products and services (PwC, 2016, p. 6). The term "GovTech" is presented against the backdrop of "CivicTech" and "Government IT", indicating that GovTech consists in innovative services aiming to solve problems or fulfil the administration's needs towards citizens or businesses. In GovTech, the administration is the client of entrepreneurs acting for-profit (Ahmed, Dowson, 2016, p. 10-11). In line with Scottish CivTech, we believe that the essence of GovTech involves combining expert knowledge and the public sector's experience with the private sector's creativity to collaboratively solve real problems, create new products and deliver better, faster and friendlier services for everyone (Holt, 2019).

GovTech's participants and stakeholders

The GovTech market influences every citizen's quality of life. The sector's key participants and stakeholders are: the public administration, entrepreneurs, investors and recipients of the administration's services. The central entity in GovTech is the public administration, but the market of innovative services for the administration could not function properly without any of these participants.

> **The GovTech sector's stakeholders** are the public administration, entrepreneurs, investors and recipients of the administration's services.

The cycle of GovTech services and its participants

The cycle of GovTech services begins with the perception of a problem that needs to be solved. It can be noticed by any stakeholder, though usually the administration itself draws attention to it. Sometimes, though, it is noticed by a citizen who notifies the public administration, by an entrepreneur who offers to solve the problem or by an investor who identifies a problem and provides funds for developing a solution.

The next phase involves developing solutions. Sometimes, market participants seek them together; for instance, the administration with an entrepreneur as part of preliminary

market consultations, innovation partnership or a contest. Or they might be prepared already; in those cases, they just need to be purchased and implemented.

The developed product must be implemented and then assessed. A positive assessment should result in the solutions being used by other units of the administration. Here, the Digital Marketplace is especially valuable; an administrative body can identify the available products, which have usually been tested already, and then purchase and implement them itself, saving time.

The administration and citizens

The direct recipient of the GovTech sector's services is the local and central administration, broadly understood, and other public entities, such as hospitals, schools and transport companies. However, the technological services' effects always concern citizens, the recipients of the administration's services. Even when GovTech concerns the organisation of work in the public administration, the ultimately effect of improving how it functions improves the quality of services for citizens. The biggest GovTech projects are carried out centrally and concern services provided by the government administration. Repeatable and scalable projects undertaken by the local administration are important, too. Regardless of the recipient, GovTech solves urgent problems in the public sector using innovative tools that are completely new or brought over from the private sector. It either creates new functions or improves existing ones, lowering the cost of public services or adapting them to recipients' needs.

Entrepreneurs and investors

The GovTech market is based on entrepreneurs providing modern ICT services. Investors are another important stakeholder in the GovTech market, especially private equity, venture capital and seed funds or business angels[3]. If a start-up gains a fund's recognition, it can count on capital – potentially several dozen millions of dollars – but also know-how (Filer, 2019, p. 34-39). This makes funds with knowledge and experience when it comes to ICT solutions for the administration, working with officials and public procurement especially important for the development of the GovTech market. Investors' interest in the GovTech sector is above all focused on the American market at present.

Non-profits, universities and advisers in the public and private sector also play an important role in the GovTech market, providing stakeholders with substantive support.

[3] Private equity is an over-the-counter investment that accepts relatively high risks, aimed at making profits in the medium or long term. It usually deals with larger investments into companies with an established position on the market, where something needs to be improved or has potential. In contrast, venture capital refers to riskier investments in small – even germinating (so-called seed) – but promising ventures. A venture capital fund or a wealthy investor (business angel) is aware that most of its investments will be unsuccessful, but the few successful ones will more than cover the losses incurred (e.g. Google, Skype or Wirtualna Polska). This type of investor likes the ICT sector, including GovTech.

Some of the biggest investors in the GovTech market

Bregal Sagemount et al. invested near USD 200 m in Accela, which pro-vides IT solutions for public entities.

Omidyar Network has invested around USD 90 m in GovTech initia-tives, including USD 15 m in Change.org, a website that makes it easier to organise public petitions.

Andreessen Horowitz invested USD 15 m in OpenGov, GovTech Fund, EkistaVen-tures Fund/Incubator Chicago and the Knight Foundation, which spent seven-digit amounts on a series of GovTech projects (Ahmed, Dowson, 2016, p. 27).

Some of the successful investments in the GovTech sector in Great Britain

Citymapper – a transport app using Transport for London data obtained almost USD 50 m.

Network Locum – a tool supporting employment in the medical sector received around USD 12 m.

Breezie – a platform supporting people who care for senior citizens re-ceived USD 7.6 m.

Neighbourly – a platform connecting communities, businesses and chari-ties obtained over USD 1.5 m.

The Data Lab is a Scottish non-profit enabling industry, the public sector and university researchers to innovate in the field of data use. Its mission is to generate economic, social and scientific value from data and transform the way industry, the public sector and universities cooperate.

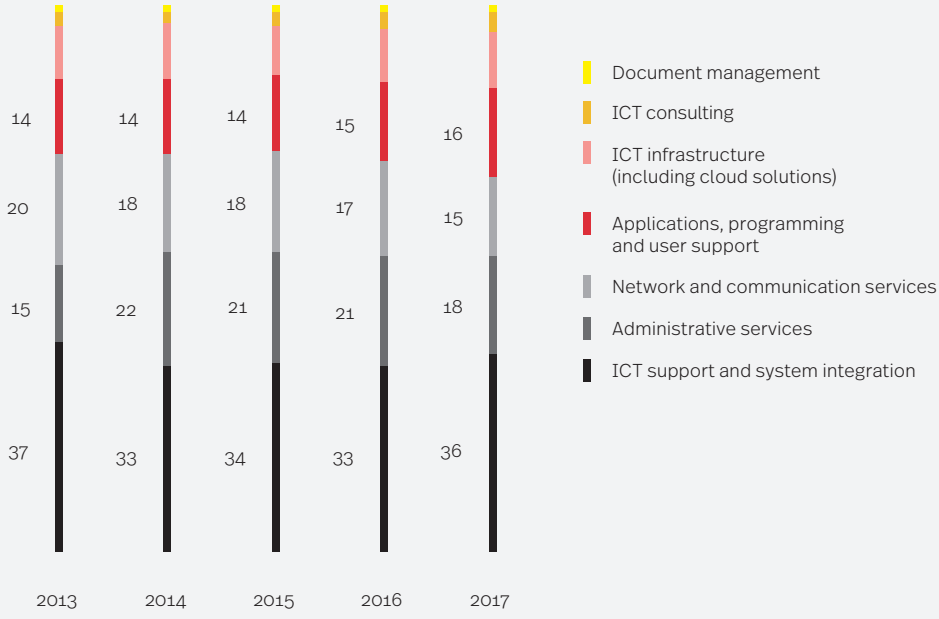
The Data Lab and other Scottish innovation centres cooperate with accelerators, such as CivTech, co-funding innovative companies (TheDataLab.com, 2018); one example is the joint support for projects implemented by xDesign (n.d.) or Wallascope, among others.

GovTech's role and sectors

GovTech's role results directly from the needs and opportunities that the sector creates for its stakeholders. For citizens, GovTech means better public services. For political decision-makers, it is an opportunity to increase productivity, create jobs and speed up economic growth. GovTech gives the administration cheaper and easier access to better solutions. For start-ups, GovTech is a rapidly growing market, offering many opportunities for development and providing relevant solutions, as well as gaining unique experience that is valued by clients. Investors perceive GovTech's growing investment potential. For businesses, an advantage of involvement in the GovTech sector is the high solvency of clients (the public administration), while having to adapt the mode of activity to requirements defined by procedures in the law on public procurement are a disadvantage (Filer, 2019, p. 34-39).

GovTech solutions are applied in many of the public administration's fields of activity. Most GovTech projects concern the internal organisation of the administration (such as cyber security or the organisation of labour) and providing public services (transport, healthcare, the media, administrative support, etc.). More rarely, the solutions focus on developing infrastructure (using drones, sensors or other devices), facilitating social participation (such as apps allowing defects in public places to be reported) or making the regulative sphere more efficient (for instance, countering money laundering) (Desmond, Kotecha, 2017, p. 9-10).

↘ Chart 1. Share of individual categories of ICT services and outsourcing in Britain in overall spending in 2013-2017 (%)



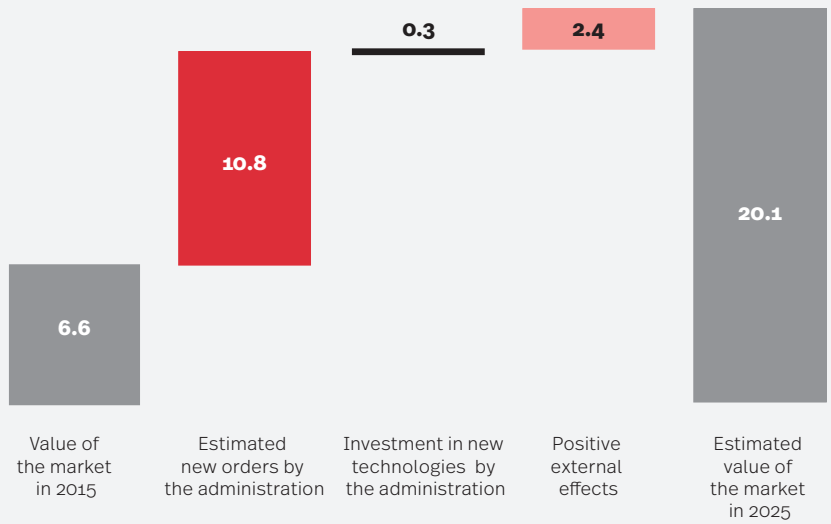
Source: prepared by the authors based on Desmond, Kotecha (2017).

The value of the GovTech market

The global GovTech market is worth an estimated USD 400 bn (Desmond, Kotecha, 2017, p. 5). In Europe alone, an estimated USD 25 bn is spent on GovTech (Accenture, 2018). The biggest market for GovTech enterprises is the US. Spending on GovTech there is expected to grow fourteen times faster than traditional government expenditures on IT (Ahmed, Dowson, 2016, p. 27). In line with these expectations, in 2012-2016 investors in the US increased their investment into GovTech start-ups by over 300%, investing USD 336 m in 2016 alone (CBInsights.com, 2017). In Europe, the leading country in terms of investment in GovTech is Britain, where the GovTech market was worth GBP 6.6 bn in 2015. By 2025, it is forecast to be worth three times as much[4].

Analysing the increase in transactions linked to the GovTech market in 2013-2016, a major increase not just in Britain, but in the whole of Europe is noticeable (PwC, 2016, p. 12). Forecasts of further growth in ICT services for the administration are unsurprising, given the equally big growth estimates for the entire technological transformation sector. In the Asia-Pacific alone, it is estimated that by 2021 60% of GDP will come from products and services created using the digital transformation (Jimenez, Lim, Cheok, Ng, 2018, s. 1).

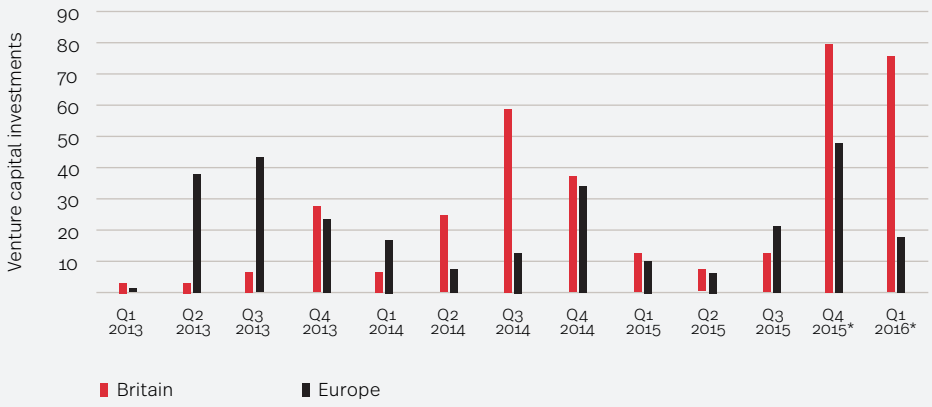
↘ Chart 2. Value of the GovTech market in Britain in 2015-2025 (billions of GBP)



Source: prepared by the authors based on Desmond, Kotecha (2017).

[4] The latest statistics are available here: https://www.public.io [accessed: 29.03.2019].

↘ Chart 3. Value of venture capital investments linked to GovTech in Britain and Europe (millions of USD)



* In Q4 2015 and Q1 2016, the value of undisclosed European transactions was omitted.

Source: prepared by the authors based on PwC (2016, p. 12).

Providing GovTech services

The GovTech market's task is to provide the administration with solutions that improve the functioning of the public sector. It becomes more difficult when regulations enabling or facilitating cooperation between enterprises (and other stakeholders) and the public administration is missing. The shortage of adequate channels for communication between businesses and the administration, as well as friendly methods for enterprises to provide it with services, is particularly relevant. In numerous developed countries, there is a conviction that traditional public procurement is not working in the tech era and needs to be more flexible (Miller, 2017). According to Australia's Digital Transformation Agency, conventional public procurement (Digital Transformation Agency, 2017a):

- → is time-consuming, complex and costly,
- → lacks coordination of activities, cooperation and transparency,
- → offers limited opportunities for smaller suppliers to participate in public procurement due to high administrative costs, excessive conditions and product-related liability,
- → is characterised by the conservatism of public units, which avoid taking risks and do not seek innovative tools for solving problems.

Engaging SMEs

In terms of the quality and price of ICT delivered to the administration, suppliers should be diversified by increasing the share of SMEs in public contracts in the GovTech sector. As the OECD argues, SMEs can frequently offer unique solutions at low prices, and are often more flexible and engaged (OECD, 2018a, p. 29). Start-ups often specialise in niche topics and have unique skills that can be developed in small teams and lead to innovation. Just like FinTech revolutionised the financial services sector, GovTech can have a positive impact on

the public administration and the services it provides. A higher share of SMEs in public orders means greater competitions, but also positive externalities for the entire economy. The Scaleup Institute estimates that a 1% increase in the number of British scaleups[5] could create 238,000 jobs and GBP 38 bn in gross value added (Scaleup Institute 2018, p. 7). Public contracts can be a springboard for small enterprises, helping them prepare and commercialise innovative ideas. While EU law prevents the application of clear preferences for SMEs (Treaty on the Functioning of the European Union, p. 47-390), some of the barriers hindering SMEs from accessing public procurement can be eliminated (Infor.pl, n.d.). Initiatives supporting smaller players on the GovTech market aim to break down habits and bring together two distant worlds: the administration and SMEs.

The typical tools of public procurement law, as well as administrative practice in this area, are not adapted to cooperation between the public sector and smaller entities. The barriers for smaller companies applying for public contracts include:

- contracts' size, which makes it more difficult for companies with lower potential than their bigger competitors to participate,
- strict requirements relating to technical standards,
- financial requirements in terms of guarantees and insurance, as well as approvals and certificates,
- costly and time-consuming preparation of offers that fit the regulations,
- insufficient information on opportunities for participating in procurement proceedings, procedural requirements and selection criteria;
- uneven distribution of risks and responsibility for the implementation of the contract between public and private parties;
- minimal use of procedures with negotiation by contracting authorities;
- the administration's lack of knowledge concerning new technology and innovative solutions present on the market;
- the administration's reluctance to cooperate with smaller entities.

SMEs' participation in ICT orders

With regulations and practices not adapted to SMEs' needs, they are underrepresented when it comes to delivering ICT solutions for the public administration. The biggest companies continue to lead in public orders involving tech (including IBM, Amazon, Capgemini, Cisco, Huawei, Oracle). In Britain, the parliament has described government technology as an oligopoly (OECD, 2019b). According to a report by Britain's National Audit Office, until recently 80% of government ICT contracts, worth GBP 16 bn, were delivered by just 18 suppliers, the biggest companies in the sector (National Audit Office, 2011, p. 17).

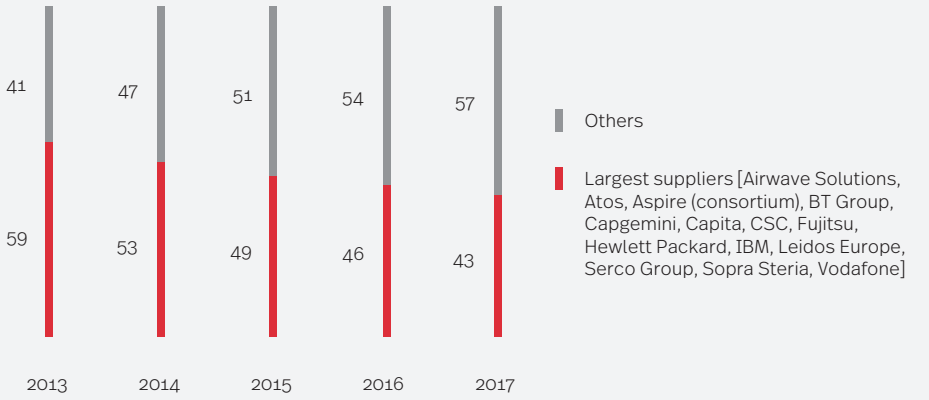
In response, the British government pledged that one-third of public procurement spending would go to SMEs by 2020 (National Audit Office, 2016). It wants to achieve this by implementing further tools supports SMEs in obtaining government contracts. Australia can serve as a model; in 2016, SMEs received 30% of the administration's spending on ICT, providing services for 60% of all projects in this area (Ashurst, 2017, p. 14).

Still, the transformation of the GovTech market is not proceeding entirely smoothly, influenced by a series of economic and political factors, including Brexit. In 2016, SMEs' share in

[5] According to the OECD's definition, a scaleup is a company (usually SME) where employment or turnover grows by over 20% per year over three years and has at least ten employees at the start of that period (Scaleup Institute, 2019, p. 6).

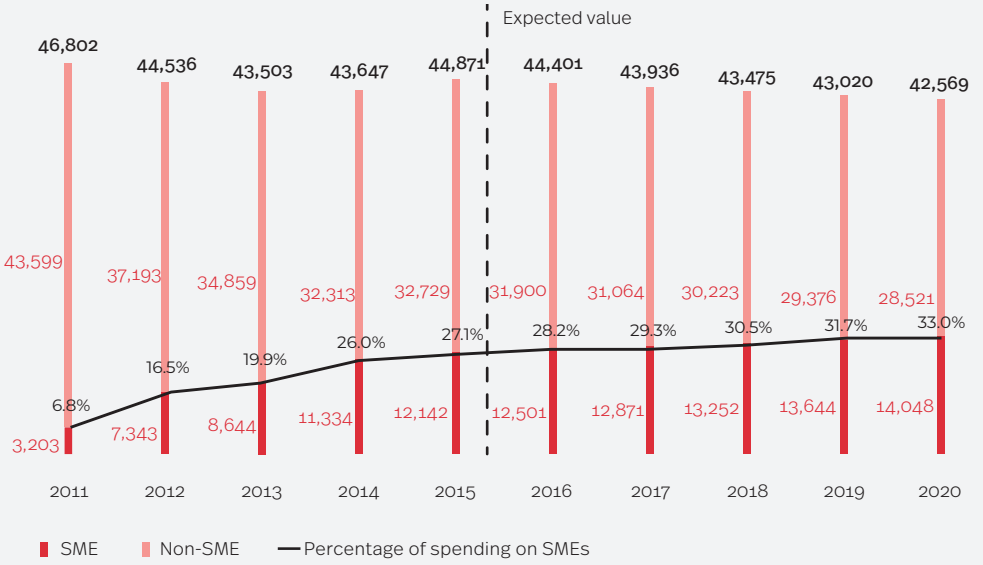
public procurement in Britain fell to 22.5%. The target of 33% has been postponed until 2022 (Davies, Chan, Cheung, Freeguard, Norris, 2018, p. 21-22).

↘ Chart 4. Beneficiaries of government procurement in the field of ICT and process outsourcing in Britain in 2013-2017 by contract value (%)



Source: prepared by the authors based on Desmond, Kotecha (2017).

↘ Chart 5. British government spending on public contracts in 2011-2020 broken down into SMEs and other companies (millions of GBP and %)



Source: prepared by the authors based on National Audit Office data cited in Desmond, Kotecha (2017).

GovTech infrastructure

Governments are adopting a series of solutions improving the public procurement process for ICT. They are remedial, seeking to make existing procedures more efficient, or innovative, which involves implementing new procedures or practices. They improve the efficiency of procurement procedures by increasing the administration's knowledge of the available technology and stimulating SMEs' activity.

Remedial tools

ICT help from experts

Public procurement for ICT may require employing external consultants with expert knowledge of the product or service being ordered. Their task is to support preparation and the contract itself, including selecting the winning service and its supplier. This is especially justified in bigger public contracts that are not standard for a given administrative body. These conditions are most often met in ICT projects. The cost of consultants in the process of planning public procurement, implementing it and performance control is often significantly lower than the losses resulting from a failed public contract.

Trial or pilot versions for the administration

Pilot projects allow administrative units to familiarise themselves with how a product proposed by entrepreneurs works. This experience helps officials decide whether to purchase it. In certain cases, pilot projects can involve implementing totally new technology or methods that have not been applied before and that have not been studied in practice.

Tell Us Once is an Australian government website that allows citizens to register changes in their data, including their address. A series of institutions have access to the data, which means that the user does not need to inform each of them about the change. The project is being developed using a trial version; the service prototype has been delivered and is being tested (Digital Transformation Agency, 2018).

Secondment for innovation

Secondment for innovation programmes seek to open the administration to businesses, their practices and technical tools using a secondment programme for officials at companies. Officials are delegated to work with start-ups or other companies, where they learn about possible solutions for problems in the administration and the services it provides. Officials can improve their skills, familiarise themselves with tools and best practices, and gain a new perspective on existing problems. Entrepreneurs learn more about the problems faced by the administration and how it functions (Newcombe, 2014).

One initiative of this kind is the "Innovation Lab" programme established by Philadelphia's city hall in 2014 to support innovation in the administration. The lab provides a co-working space where officials spend a certain amount of time cooperating with innovators and small businesses, including in the form of a hackathon. The lab's work is divided into 90-day thematic sessions, during which the administration

cooperates with entities in various branches of the economy. Participants work on solving selected problems of the administration, including ones relating to geospatial analysis, public health and safety, fighting poverty and supporting economic growth. The educational aspect is also visible in cooperation with the city's Academy of Innovation. Its participants – municipal officials – are supposed to spread knowledge about innovation at their workplaces.

> *The lab will bring the spirit of startups inside of city government. The goal is to create a culture of innovation, to sustain it and grow it long term.*
>
> Adel Ebeid, Chief Innovation Officer, City of Philadelphia (as cited in Newcombe, 2014).

An example of a project carried out by the Innovation Lab, supported by the Innovation Fund connected with lab, is Computer Skills & Bicycle Thrills. It connects two municipal programmes: KEYSPOT computing centres and a bike programme. An existing digital platform keeps city bikes safe and clean. Another project studies the spread of plants in communal buildings, many of which are pulled out and destroyed at the end of each growing season. The project aims to find out whether the plants can be stored through the winter and then passed on to social organisations (Kyu, 2016).

Joint procurement

For joint procurement, a few administrative units prepare a joint contract led by one of the units. The items ordered are identical. With more than one administrative unit involved, it is easier to share knowledge about the products available on the market. The scale of the orders works to the administration's benefit, too; it can receive better conditions and financial benefits (cheaper products).

In Poland, the central ordering party is the Centre for Government Administration Service (Centrum Obsługi Administacji Rządowej, COAR). It carries out and grants central orders for public entities, including government ones (COAR, n.d.). Examples include purchasing and delivering electric and hybrid vehicles for the state administration (COAR, 2019a) and supplying oral vaccines against free-ranging foxes with rabies to eight Regional Veterinary Inspectorates (COAR, 2019b).

Micropurchasing

Administrative units are moving away from large, multiple-part contracts, replacing them with many small proceedings that do not require formal procedures and do not create barriers for SMEs. While splitting orders is not regarded as standard for the administration, in most ICT projects this approach can turn out to be very much justified[6].

One type of micropurchasing is a modular approach to public procurement. It is formulated so that they only concern the creative component of the functionality being sought. Developing a single solution that is key to the entire project eliminates the problem of overly large orders, which often excludes SMEs from applying for public

[6] When dividing an order into parts, or delivering separate orders in parts, officials should remember that it is forbidden to make this division to avoid joint estimation of their value and thereby use the wrong procurement procedure; see article 5b in conjunction with article 32 paragraph 4 of the Polish Public Procurement Law. Apart from this, there are no legal objections to micropurchasing in Poland.

contracts. This evens out big and small players' chances, increasing competition, which results in the better choice, quality and price of ICT products offered to the administration and citizens.

The 18F US government agency tested the micropurchase.18f.gov platform for submitting micropurchasing orders in 2015-2016. The platform enabled orders for open source code for the public entities, delivered by private entrepreneurs, to be placed. The orders could be worth no more than USD 3500. Offers were submitted in the form of an auction. There were 37 auctions, with 30 ending in success. The average length of an auction was two days, with the ready solution delivered in eight days, on average. 101 small companies registered in the system[7]. One of the orders was submitted by the Federal Election Commission, which needed to build three templates used in Wagtail, Djangon's open-source content management system. The winning offer, by Scampersand, cost USD 1440.

Agile procurement

The public administration's traditional approach to public procurement begins with setting out the requirements and work schedule, and then processing the order, all the way to final implementation (the so-called waterfall approach). The waterfall approach to implementation is visible in the separation of individual phases: independent determination of the technical requirements by the administration, independent work on the solution by entrepreneurs and, after the supplier is selected, independent implementation of the ICT product. However, this approach is ill-suited to digital solutions. Selecting them requires specialist technical knowledge and experience working on ICT tools, which are not always present in the administration. Setting the requirements before the start of an ICT project often leads to results that do not satisfy the contracting authority.

An alternative approach is agile procurement, which allows constant, joint work between the entrepreneur and contracting authority on the product's final shape and features (Andrews et al., 2016, p. 4). In contrast to the waterfall methodology, it involves delivering smaller parts of the project (modular orders), constant cooperation between the parties, and moving from general assumptions at the start of the contract to detailed guidelines that crystallise while the project is being carried out (accepting its flexibility and changeability).

Waterfall methodology – characteristic of traditional ordering procedures. The supplier executes the project in separation from the contracting authority, which only checks whether the product works and meets assumptions after work is completed. Waterfall methodology increases the risk that the result will differ from the one envisaged by the authority. It is not the optimal tool for ICT procurement[8].

Agile methodology– characteristic of procurement procedures for ICT services. It involves delivering of smaller elements in a project (modular orders), constant cooperation between the parties and moving away from general assumptions at the start of the order, towards detailed guidelines that crystallise while the project is being implemented.

[7] For more on the project see: https://micropurchase.18f.gov/insights.html [accessed: 28.03.2019].
[8] For more, see: http://combeenut.pl/waterfall/ [accessed: 28.03.2019].

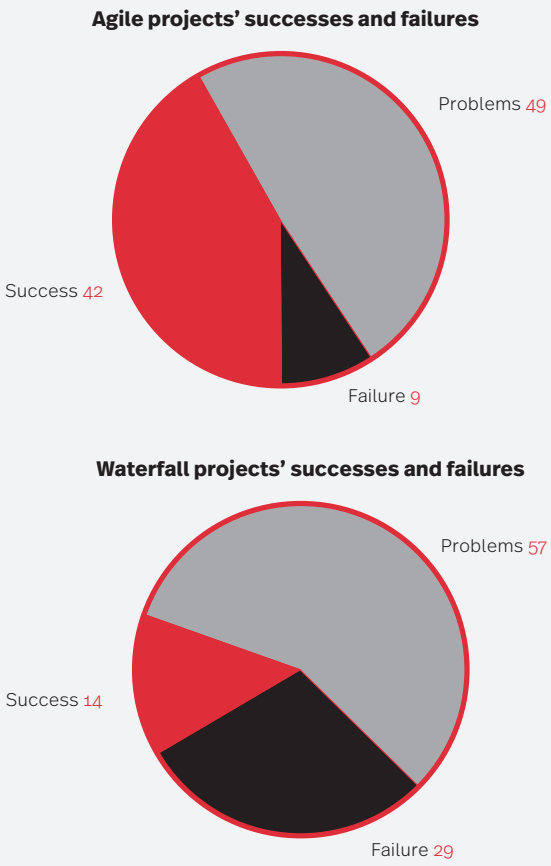
The agile methodology's effectiveness

Statistics show that ICT projects carried out using the agile methodology have much higher chances of success than those using the waterfall methodology (Węgrzyn, 2017a). 42% of the former end in success, compared to just 14% for the latter (Kaganiec, Husarzewski, 2017).

Examples

The agile methodology is commonly used by private companies, but is not standard for ICT contracts by public sector entities. It is, however, increasingly used for public procurement in developed companies. Given its effectiveness, in the US the agile approach is recommended for the central administration (Kaganiec, Husarzewski, 2017). It has been used in a series of key projects, including when building a terminal at Heathrow Airport (2008), creating a friendly system for registering businesses in Denmark (2011), modernising the FBI's document circulation system (2012) and introducing new software for managing the Port of Rotterdam (2015) (Port of Rotterdam, 2018).

↘ Chart 6. Success and failure of agile and waterfall projects (%)



Source: Maruta (2019).

Startup in Residence

Startup in Residence programmes are a specific application of the agile methodology. They aim to find and implement new solutions for the local community. This involves close cooperation between the local administration and an entrepreneur, who helps find innovative solutions for that unit's problems. This tool was used in the procurement for modernising street lighting in San Francisco. It enabled alternative and innovation solutions to be collected from entities that would not have had the chance to present their ideas in a traditional public procurement procedure (CityMart, n.d.-a).

> *"It's not that you don't know the 30 vendors who can give you a street light, it's that you don't know the 30 alternatives to the street light."*
>
> Sascha Haselmayer, CEO and founder of CityMart, on the Startup in Residence programme (as cited in Miller, 2017).

Challenge-driven approach

There is a long history of innovation through competitions. In 1714, the British government offered a prize of GBP 10,000-20,000 for any citizen who developed a practical method for accurately determining the longitude of a ship (Baker, 2019). Prizes were awarded for the first uninterrupted flight from New York to Paris (1919), canned food (1810), margarine (1869) and the first petrol car (1870; Conrad et al., 2017). Despite this history, setting challenges (organising competitions) to solve specific problems of the public administration is not the standard mechanism for public procurement.

The agile methodology can be applied by adopting a challenge-driven approach to public procurement. The contracting authority formulates the problem, but does not develop a conception for solving it. Rather than set precise tender requirements, it leaves entrepreneurs space for their own innovative approach to a given task. This approach offers the following advantages:

1. The ordering party does not have to think about how it would like to solve the problem.
2. It is based on a fresh view of the problem by people from outside the organisation, which may lead to an unconventional and thereby more effective solution.
3. It allows smaller companies to win public contracts because they do not have to go through an expensive tender procedure.
4. When the solution is purchased, the ordering party can be sure that its problem will be solved effectively.

Challenges vary between countries, but they share several basis elements:

Step 1. A public-sector organisation formulates a problem that it wants to solve.

Step 2. The description of the problem or challenge is published on a platform that can be accessed by anyone interested in finding a solution.

Step 3. Companies, teams or individuals submit their ideas for solving the problem.

Step 4. The best ideas are used to create a prototype.

Step 5. The authors of the best solutions can continue cooperating with the organisers of the challenge to develop the final version of the product and implement it.

Challenge.gov

The US Challenge.gov programme is an example of the successful institutionalisation of the crowdsourcing of ideas for the administration (Farrell, Goodman, 2013). Launched in 2010, it has enabled the development of around a thousand solutions to problems presented by the administration. The challenges are collected on a permanent platform. Anyone can register there and submit ideas for solving any number of problems. As part of the programme, entrepreneurs have won prizes worth over USD 250 m in total (Challenge.gov, n.d.). The projects presented in the competition can be purchased by the administration via the public procurement procedures available.

> **Crowdsourcing** – the process of outsourcing tasks traditionally carried out by staff to an unidentified, usually very broad, group of people, such as citizens, entrepreneurs or innovators (Brabham, 2018).

Projects carried out with the help of Challenge.gov include (Desouza, 2012):

Apps for Communities Challenge – a competition for developing an app that provides personalised data to make local public information more useful and practical. The main prize went to a system that informs passengers about waiting times for buses in real time (Stevenson, 2011).

Challenge to Innovate (C2i) Gaming Challenge – the challenge sought ways to use interactive, game-based study to improve teaching and learning. It focused on using pupils' existing gaming and technological skills that could be translated into achievements. The winning ideas included a computer game that allows pupils to travel to historical or imagined crime scenes, playing reporters or investigators.

The Healthymagination Challenge – the competition sought innovative ways to diagnose breast cancer, focusing on projects allowing it to be detected early, stratify patients and personalise treatment. One of the prizes went to MyCancerGenome for its personalised approach to triple negative breast cancer. This resulted in a free online oncological service for doctors, patients, carers and researchers developed by Vanderbilt University in Nashville. It publishes the latest information on mutations that lead to the development of breast cancer and the consequences of therapy, including the results of genome-based clinical trials (MyCancerGenome, n.d.).

GovTech Catalyst

Another example of a successful challenge-driven programme is British GovTech Catalyst, which has a budget of GBP 20 m for funding tech solutions for the public sector in 2018-2021. The government and local administration can submit problems. The solutions must use digital technology and should reduce costs or improve services. The units submitting the problems should be ready to buy the solution developed as part of the programme. The programme foresees 15 competitions (three editions, with five each). In each challenge, five teams will receive up to GBP 50,000 for developing a solution prototype in 12 weeks. The two best proposals will receive up to GBP 500,000 and another 12 months to create the product. The products will be available for all public entities to purchase (CityMart, n.d.-b). The challenges concern a broad range of ICT services used at the central and local level.

The Department for Transport (DfT) and Royal Borough of Greenwich announced a joint challenge on collecting and using data on road traffic, to reduce the size of traffic jams. The challenge was announced in the first round of competitions in May 2018. Prototypes automating

data collection and using it to improve transport are now being developed and tested[9].

The Home Office[10] **and Border Force**[11] announced a challenge involving preparing an innovative solution for detecting illegal items arriving in Britain by post. The proposed tool must not slow down the transport of goods (Innovation Funding Service, n.d.-b).

> *We need fewer huge mega-projects; systems that can talk to each other; a level playing field for open source software and smaller suppliers; to buy off the shelf rather than always seeking bespoke perfection; to open up access to government data; and far more effective procurement and management of projects. We also need a new vision for how government can engage with citizens.*
>
> Francis Maude, the British minister responsible for the reform of the public sector; London, 5.10.2009 (as cited in National Audit Office, 2011, p. 20).

CivTech

Scotland, which launched its CivTech programme in 2016, was one of the first countries in Europe to start solving the public administration's problems using challenges. Financial prizes are provided by the challenge's sponsor. Interested teams submit applications; of these, a certain number are selected. In the next two phases (exploratory and accelerating), selected teams work with the sponsor to gain a better understanding of the problem and prototype the solution. The exploratory phase lasts three weeks and results in a refined proposed solution. Each team receives GBP 3,000 for participating in this phase. The best team participates in the accelerating phase. Its task is to create a prototype of the product. For this, it receives GBP 20,000. The authors of the winning solution can extend cooperation with the organiser to implement the solution. CivTech is not only a way to find innovative solutions for the public administration, but also an opportunity for participants to develop and present their abilities (CivTech, n.d.-a). The winners are invited to present their solution to a broad public made up of public and private entities and investors. In the programme's three editions, participants have found solutions to 26 challenges (CivTech, 2018a).

NHS Scotland wanted to find a way of improving the registration system to shorten the waiting time for seeing a specialist, while reducing the time lost by doctors when patients fail to show up for appointments. The project proposing to create a flexible online registration system won.

Transport Scotland was looking for a way to speed up the detection and repair of holes in the road. The winning solution involved creating an app that collects information on holes by registering the shocks when a vehicle drives over them.

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[9] The challenge is a response to DfT research showing that the local authorities lack access to real-time information on traffic, cyclists and pedestrians and that current methods for tackling traffic jams are based on manually-collected data. Further information: In novation Funding Service (n.d.-a).

[10] The government department responsible for immigration policy, security and public order: https://www.gov.uk/government/organisations/home-office/about [accessed: 08.04.2019].

[11] The Home Office unit for border control: https://www.gov.uk/government/organisations/border-force/about [accessed: 08.04.2019].

Innovative Solutions Canada

This programme seeks to solve the public administration's problems and develop the Canadian tech sector (Government of Canada, 2019a). It has three phases: presenting the idea, prototyping and commercialisation (Government of Canada, 2018a). The teams behind the winning projects receive grants of up to CAD 150,000 (phase 1) and up to CAD 1 m (phase 2). For the contract for implementing the winning project, there is no financial limit (phase 3). As part of the programme, 42 problems submitted by the public administration relating to ICT products or other innovation solutions have been solved (Government of Canada, 2019b).

Environment and Climate Change Canada (ECCC) was looking for a way to reduce the amount of rubbish by developing food packaging that would be easy to recycle, produce and use. The project aims to reduce waste and increase recycling, especially that of plastic packaging (Government of Canada, 2018b).

Shared Services Canada (SSC) wanted to provide cheap and rapid Internet access to Canadian officials and citizens who live in remote locations. The project's main purpose is to provide Canadian citizens with access to online government services such as passport applications or tax declarations (Government of Canada, 2018c).

Canadian Food Inspection Agency organised a competition for a chemical substance that would attract a range of wood-boring insects that attack deciduous trees that grow in Canada (Government of Canada, 2019c).

Following the British, Scottish and American example, more countries worldwide are organising GovTech competitions. The Polish, Portuguese[12] and Danish authorities are among those presenting their ideas for challenges (Elliott, 2019).

Digital Marketplace

The Digital Marketplace is a purchasing platform connecting the public administration with entrepreneurs in an innovative way[13]. A British idea, it also operates in Australia and New Zealand. Given its recognition in the international community and promotion by the OECD, this type of platform is likely to spread to many other countries, too.

> **Digital Marketplace** – an online platform that allows the public administration to find IT services tailored to its needs and purchase them more rapidly than using conventional public procurement procedures.

In Britain, the Digital Marketplace works based on framework agreements signed by the Crown Commercial Service (CCS) and entrepreneurs, who publish their services on the government platform based on the agreements. To sign an agreement with a public entity that is seeking services, a call-off contract is enough. Including a significant part of the arrangements required by public procurement law in the framework agreement allows administrative units to acquire ICT services much faster and with less administrative effort than using conventional public procurement procedures.

[12] https://govtech.gov.pt/# [accessed: 28.03.2019].

[13] Excerpts from the report on the Digital Marketplace in Britain were prepared based on the legal opinion of Maruta Wachta law firm analysing the British G-Cloud in terms of the possibility of incorporating the British solutions into the Polish legal system, including possible limitations (Maruta, Wachta sp.j., 2019), and information published on the following platform: https://www.gov.uk/

How the Digital Marketplace delivers services

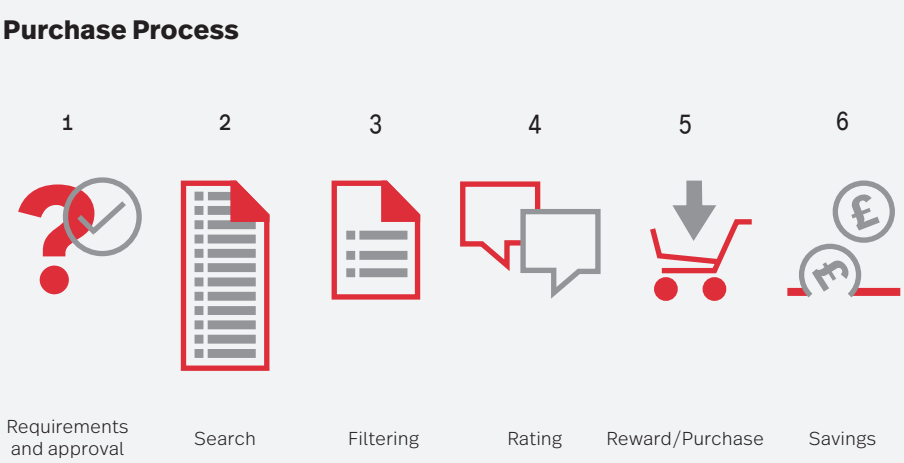
In the first phase, the CCS signs framework agreements with suppliers in an open procedure. In Britain, there are three types of framework agreements: those concerning cloud services (G-Cloud), digital outcomes, digital specialists and user research services and physical datacentre space for services that cannot be transferred to the cloud. The framework agreements tend to be iterated. Given the ICT market's dynamism, they are signed for a short period (6-9 months) and then replaced with subsequent versions.

The CCS publishes an invitation to tender (ITT). Entrepreneurs respond with online supplier declarations, in which they include a description of the service and its price, and consent to the content of a framework agreement and model call-off contract. The CCS assesses the suppliers, looking at their technical and professional potential, as well as the extent to which they meet security and data protection requirements.

If the CCS accepts the offer and a framework agreement is signed, an individual ordering party can award a public contract in accelerated mode. Choosing among the services available on the platform, the individual contracting party does not need to organise separate proceedings or prepare order specifications.

The announcement published on the platform includes the price, supplier's terms and service description. The individual contracting party assesses offers based on cost and quality, chooses services that meet its requirements and sends an order form to the selected supplier, outlining its requirements, the place and course of service provision, and quality and technical standards. The call-off contract signed when the contracting party confirms that supplier's consent to the conditions presented in the order form.

↘ Diagram 2. Searching for services in the Digital Marketplace



Source: prepared by the authors based on https://www.jadu.net/blog/blogImages/buying_process.png [accessed: 28.03.2019].

Scale and results of the Digital Marketplace in Britain

In 2012-2019, ICT services worth over GBP 5.26 bn were purchased via the Digital Marketplace. Its growing number of users reflects the platform's success. Initially, the purchases made using it were worth tens of millions of pounds per year; now they are worth billions. Most of this amount (GBP 4.36 bn) concerns the central administration's contracts. So far, 2143 units have ordered from 1841 suppliers using the Digital Marketplace.

The Digital Marketplace is an effective tool for increasing SMEs' participation in public contracts. Almost half of all orders conducted via the Digital Marketplace (43.53%) go to SMEs. International companies use it, too. IBM earned almost GBP 100 m delivering orders for 36 units via the Digital Marketplace. To do so, though, it had to compete with smaller entities, which influenced the quality and price of its services[14].

Innovation Partnership Platform

Austria's Innovation Partnership Platform Innovationspartnerschaft.at combines the functions of conventional remedial tools (providing the administration with knowledge on the tools available on the market), the Digital Marketplace purchasing platform and challenge-driven competitions. It was established by PPPI Service Centre (IÖB), operating as part of the Federal Procurement Agency (BBG) and funded by the Ministry for Digital and Economic Affairs and the Ministry for Transport, Innovation and Technology.

The platform is based on two modules: "challenges" and "solutions". In the challenge section, public entities can set out their needs and describe problems that need to be solved. If an entrepreneur thinks that he can deliver an innovative product that meets the administration's needs, he can submit his idea using the platform. An expert panel chooses the best solution, looking at feasibility and innovation. The community can assess solutions, too: the higher a project's rating, the more likely it is to be chosen. The authors of the best projects are rewarded with a meeting with public entities and the opportunity to present their product or service.

The Medical University of Innsbruck announced a challenge for creating software that combines a room reservation system with the building's technical (heating, ventilation, lighting) and user system (projectors, speakers, door closing system) to minimise the university's costs. The solution was supposed to assume that the systems are fully compatible: the door opens for the planned lecture, the lighting, air conditioning, projector and blind control system turns on automatically. Because students use rooms that have not been reserved, the system was meant to be activated by CO_2 and presence sensors, and consider weather conditions. Seven companies submitted ideas. Three of them (Erfinderei, HST and Kapsch) made it into the second round; Innovation Dialogue (Innovationsdialog) with the university. Based on agreements during this dialogue, they were invited to submit offers (IÖB Innovationsplattform, 2016).

Wiener Linien (2019) announced a competition for an app informing passengers of Vienna's U6 metro line about tourist attractions that they were passing. 12 projects were submitted; four qualified for Innovation Dialogue (IÖB Innovationsplattform, 2019).

Innovationspartnerschaft.at also contains a section of solutions where entrepreneurs can present innovative products or services. Projects that pass the IÖB's quick test

[14] The latest statistics on Britain's Digital Marketplace are available on the Crown Commercial Service's website (Digital Marketplace, 2019).

are presented on the “Marketplace Innovation” purchasing platform for the administration. In March 2019, there were 144 solutions on it.

Greenide presented plans to build modern charging stations for electric cars. Their distinguishing feature is their multi-functionality; they are also parking meters, Wi-Fi hotspots, ATMs, advertising space (thanks to two 40-inch screens) and even online sales points for the advertised products, which can be paid for and sent to an address in a few touches Multifunktionale Ladeinfrastruktur & Parkraumbewirtschaftung (2019).

GovTech in selected countries

Britain

Innovation in public procurement was part of the state's broad digital transformation in Britain. After the 2010 elections, the biggest ICT contracts were reviewed, resulting in a proposal to rationalise them. A special unit, the Government Digital Service (GDS), was established for digital projects. GDS is a unit of the Cabinet Office (Government Digital Service, 2019). It has around 850 employees[15] and was allocated GBP 455 m for its work in 2016-2020 (National Audit Office, 2016, p. 4). So far, it has delivered four major platforms:

- the British administration's new service and information interface, "GOV.UK",
- the "GOV.UK Verify" personal identification platform,
- the "Digital Marketplace" public procurement platform for ICT,
- the "Performance Platform" for analysing the performance of public administration's services.

GDS is responsible for the digitisation of several dozen types of public services, from voter registration to renewing patients, via arranging prison visits (EMC², 2019). Its aim is to oversee digitisation processes in the administration, substantive and organisational support in the field of digitisation and providing innovative thoughts and solutions. GDS supports the administration's efficient operation in the digital reality, helps the authorities solve technical problems, protect against cyberattacks and build useful applications. By controlling the

GBP 150 m

GDS budget in 2016-2017

GBP 1.3 bn

savings resulting from GDS control activity since 2011

57%

percentage of the GDS budget allocated to developing shared platforms over the next four years

[15] https://www.gov.uk/government/organisations/government-digital-service/about [accessed: 28.03.2019].

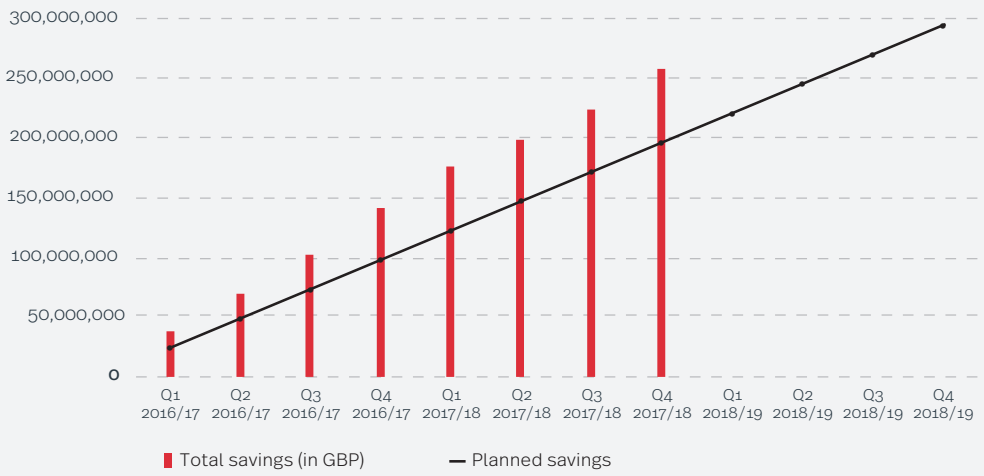
cost of major ICT orders, GDS has saved the British administration billions of pounds (Andrews, et al., 2016, p. 28). By introducing modern technologies streamlining the broader administration, it saved over GBP 1.3 bn in 2011-2017 (National Audit Office, 2017, p. 4). Ensuring services and products that were better-adapted for the ICT market was key to streamlining the administration. The most important British GovTech initiatives for streamlining public procurement were GovTech Catalyst and the Digital Marketplace platform.

The British government supports the implementation of the Digital Marketplace in other countries. It is also initiating the construction of an international market for easily-accessible ICT services for the administration (Smith, 2018). This resulted in the *Global Digital Marketplace* project, which aims to involve officials and entrepreneurs in other countries in the programme. British suppliers registered on the platform will gain access to a wider sales market and the British administration to a wider catalogue of products. Between March and June 2018 alone, GDS staff visited six countries interested in cooperation (Grant, 2018).

Scotland

Scotland should be analysed separately from the rest of Britain due to its original approach to digitisation and characteristic ways of streamlining public procurement. The Scottish Government's Digital Directorate (GDD) is responsible for digitising the public sector. Its tasks include carrying out the digital strategy, implementing modern solutions that serve citizens and the administration and improving the provision of e-services (Scottish Government, n.d.-a, n.d.-b).

↘ Chart 7. **Savings in public procurement in the Scottish administration in 2016-2019 compared to the three-year goal**



Source: prepared by the authors based on Scottish Government Procurement (2018).

An important initiative is the GovTech programme, which aims to create a platform for cooperation between the public administration and citizens, enabling the provision of innovative

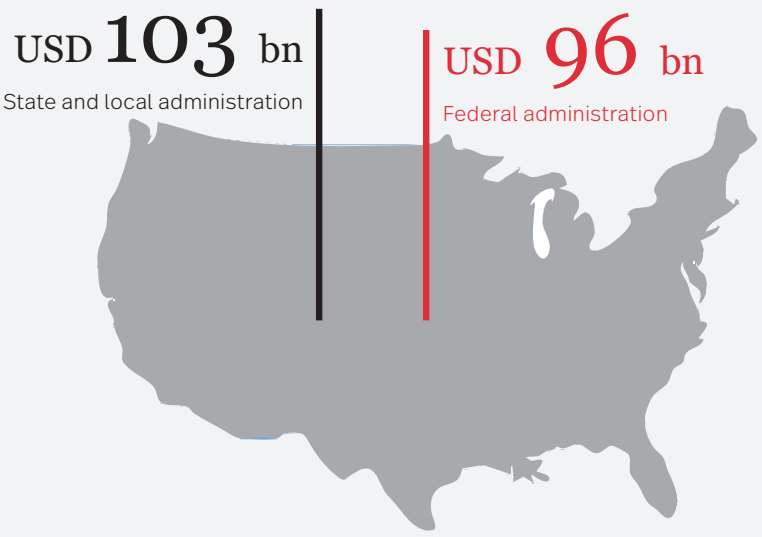
solutions for society (CivTech, n.d.-b). It organises competitions based on the challenge-driven approach and creates a broad GovTech ecosystem bringing together administration, entrepreneurs, investors, universities and NGOs from Scotland and beyond (EcoSystem.Scot, n.d.). hree editions of the CivTech programme have been held so far. The first, in 2016, included nine challenges (CivTech, 2018a). There were six the following year and eleven in 2018 (CivTech, 2019). A fourth edition started on 15th of July (CivTech, 2019).

CivTech is especially involved in promoting the competition approach abroad. For this, it uses the CivTech Academy programme, through which the Scottish organisation starts cooperating with units responsible for the GovTech market in other countries (CivTech, 2018b). Knowledge, know-how and best practices are exchanged. CivTech's partners include the unit carrying out the GovTech Polska programme. The countries' framework for cooperation is set out in a letter of intent on cooperating to support innovation in the public sector. This provides the basis for exchanging knowledge, support for developing programmes and deepening contacts between the Scottish and Polish unit (Letter of Intent between the GovTech Poland Committee and the Scottish Ministers acting through the CivTech® Programme concerning Cooperation in Support of Bringing Innovation to the Public Sector, 2018).

The United States

In the US, spending on IT for the administration is among the highest in the world. In 2018, around USD 200 bn in total was spent at the federal, state and local level; twice Poland's budget. The scale of public spending on ICT products supports the rapid development of American companies operating in the GovTech sector.

↘ Chart 8. The US administration's spending on IT in 2018



Source: prepared by the authors based on GovTech Navigator (n.d.).

To facilitate cooperation between the public administration and companies on innovative solutions, the United States Digital Service (USDS) and 18F were established in 2014.

18F

The impulse for establishing the 18F agency were problems linked to launching the HealthCare.gov website, which had cost taxpayers hundreds of millions of dollars, but turned out to be a big failure (Jeffries, 2014). The 18F is the government's digital services agency established in March 2014 by Presidential Innovation Fellows, a scholarship programme (operating as part of the federal government since 2015) for innovators in the public sector that also organises broad cooperation between entrepreneurs, non-profits, universities and the federal government. Its main task is to provide digital services and technology products for other government agencies, as well as work with them to solve technical problems and create products and services that serve the public using technology. The 18F uses agile methodologies (Agile Principles and 18F Practices, n.d.). The name 18F comes from the address of the General Services Administration (GSA), where the agency is based, in Washington, DC: 1800 F Street.

Crime Data Explorer – in August 2017, the Federal Bureau of Investigation (FBI) asked the 18F to help create a digital tool that would provide citizens with better access to crimes data collected. After consultations with various types of users of the FBI information system, Crime Data Explorer was ready. This interactive website contains data on trends, downloadable data sets and an open API that allows tools using the data to be built. The new website enables the FBI to reach a wider audience, promote citizens' involvement, and increase transparency and accountability in law enforcement (18 F, n.d.-a).

CALC – cooperation between 18F and the General Services Administration (GSA), the government agency supporting government units in the employment of contractors, was also a success. Establishing a competitive hourly rate for jobs commissioned by the administration involved searching hundreds of paper documents manually. The GSA asked 18F to help it improve the process. This led to the Contract-Awarded Labor Category (CALC; CALC, n.d.), an interactive website that allows thousands of previous contracts to be searched and compared. Additional tools include the sorting of contracts into categories based on employees, experience or level of education. The new device's efficiency and accuracy have allowed savings in working rates by 0.1% on average. It might not seem like much, but given the size of federal contracts, it means hundreds of millions of dollars a year (18 F, n.d.-b).

18F and GSA's Federal Acquisition Service signed an Agile Blanket Purchase Agreement (Agile BPA). It foresees joint assistance for federal agencies in finding sellers who can and want to work with the administration in so-called agile mode. A database of sellers used for internal and commissioned 18F agency projects is being created, as well as agency projects that have an agreement with 18F. Signing with the sellers of blank contracts allows orders to suppliers registered in the database to be placed directly. In the process based on agile methodologies, tasks are planned first. Then a competition is organised, with the following stages: submission of offers, evaluation and prizes.

US Digital Service

US Digital Service (USDS) was established by the White House in August 2014 to modernise the immigration service, veterinary benefits and work on the HealthCare.gov website (The U.S. Digital Service, n.d.). It is part of the Executive Office of the President of the United States. In 2016 alone, USDS obtained USD 14 m for its objectives, with an additional USD 30 m for

implementing further projects relating to supervising the digitisation of administration (The U.S. Digital Service, 2016, p. 4).

USDS offers IT consulting services to federal agencies. Its main purpose is to simplify digital services for citizens and businesses and to improve federal websites. USDS implements targeted, practical tasks in which small teams of technical experts join existing agency programmes. This accelerates the adoption of modern private sector practices in particularly important projects. USDS is working on modernising processes and practices in ICT procurement. It also works with central administration units, supporting the implementation of shared tools and services.

HealthCare.gov – was the project that led to the USDS (The U.S. Digital Service, 2016, p. 10). In 2013-2014, a team of experts from the private sector helped transform, update and simplify the existing platform. It helped 8 m Americans to compare the price of health insurance plans, register for their chosen plan and check whether they qualify for government healthcare subsidies.

Login.gov – this system developed by USDS lets Americans access a series of public services using a single, simplified account (The U.S. Digital Service, 2016, p. 73-74). The first service operating as part of it was the Department of Homeland Security's Customs and Border Protection recruitment website (CBP; Homeland Security, n.d.). Then CBP's Trusted Traveler programmes, which help Americans travel quickly and safely in North America, were integrated into Login.gov[16]. Now integration with USAJobs.gov is underway, which will expand the user base of Login.gov to 12 m people. USDS estimates that, by consolidating consumers' identity using Login.gov, the US administration will save hundreds of millions of dollars while making all the integrated services more accessible and useful (The U.S. Digital Service, 2017, p. 10).

USDS (The U.S. Digital Service, 2016, p. 7-8) enabled the following to be carried out, among other projects:

- modernising of the Electronic Immigration System (2014), which means that 25% of applications for immigration transactions are processed electronically. The system also allows people to renew their Green Card electronically;
- simplifying services for veterans using Vets.gov (2015). A simple, easy-to-use website that consolidates information for veterans was created;
- providing secure access to taxpayer information (2016). The user verification process is based on identity security and two-step authentication to protect confidential data;
- improving the visa processing system at the Department of State (2016).

USDS is working on a new programme that will make it easier for American farmers to legally hire foreign workers by reducing the number of forms to one, filled out online (a "one-stop shop"; Farivar, 2018). In the five years since it was established, USDS has saved the US administration around USD 617 m (The U.S. Digital Service, 2017, p. 3).

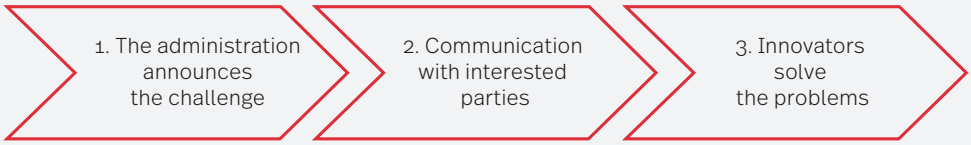
Challenge.gov

In 2010, the US General Services Administration (GSA) established Challenge.gov, the official centre for federal competitions based on the challenge-driven approach (*About Challenge.gov*, 2019). Challenge.gov helps federal agencies share challenges with the broad public and solve problems in cooperation with experts in various fields. Since 2010, the US

[16] https://ttp.cbp.dhs.gov/ [accessed: 29.03.2019].

administration has organised over a thousand competitions, including as crowdsourcing, and offered over USD 250 m in cash prizes for the best ideas. They have been won by all sorts of people; students, amateurs, small business owners and academics (Challenge.gov, n.d.).

↘ Diagram 3. The Challenge.gov process



Source: prepared by the authors based on: http://science2society.eu/content/challengegov [accessed: 29.03.2019].

The Department of Health and Human Services used the Challenge.gov platform to hold a competition on ways to fight breast cancer. It was won by a team of researchers from the University of Akron, Ohio, led by Dr Judit E. Puskas. It won a prize of USD 100,000 for designing safer and stronger breast implants that can help fight and treat cancer (The University of Akron, 2012).

Canada

Canada has GovTech initiatives at both the province and federal level. It was inspired by the successful programmes in the US – 18F and the US Digital Service. Ontario was the Canadian pioneered opening the administration to innovative methods of obtaining ICT products. In 2017, it authorities established the Ontario Digital Service (ODS), which aims to support the creation of new functionalities for the administration using agile methodologies. It focuses on improving online public services (including official websites), making them more comfortable, intuitive and easy to use (Ontario, 2017). ODS also aims to improve government services by implementing agile methodologies and clouds (Ontario, 2019a).

Innovation and Skills Plan aims to make Canada a global leader in innovation, creating better-paid jobs and strengthening the middle class (Governent of Canada, 2019b). It covers 23 programmes, including the Strategic Innovation Fund (which has been used to invest USD 8.1 bn in innovation), Innovation Superclusters (which supports sectoral partnerships in innovative sectors, which is supposed to create 50,000 jobs and boost the Canadian economy's potential by USD 50 bn over the next ten years) and Innovation Canada (a digital platform that simplifies access to software by adapting companies to programmes and services;Innovation, Science and Economic Development Canada, 2019).

Digital Government, a platform seeking to improve communication between citizens and officials, operates as part of ODS. Its tools include Budget Talks, an interactive online platform that citizens can use to propose their solutions concerning the budget, Health care options, which helps people find healthcare services, Ontario.ca, the government's online information service, and Consultations directory, where citizens can propose new regulations or solutions (Ontario, 2019b).

In 2017, the federal government launched Canadian Digital Service (CDS), the government team of experts building easy-to-use government services (Canadian Digital Service, n.d.) and Innovative Solutions Canada (ISC), the government programme supporting the purchase and implementation of innovations proposed by small Canadian businesses, with the federal government as their first customer (Government of Canada, 2019a). CDS is part of the Treasury Board of Canada Secretariat (a branch of the Treasury Board) and ISC is part of the government's broader *Innovation and Skills Plan*, spread across the whole administration.

Canadian Digital Service

The CDS aims to find an effective way of communicating between the federal administration and citizens (Simcoe, 2017). To develop new paths and ICT services that support their implementation, CDS works closely with entrepreneurs and innovators using agile methodologies (Canadian Digital Service, n.d). For its current, three-year plan (2017-2020), CDS has CAD 25 million in funds.

GC Talent Cloud was launched by CDS in autumn 2018 to engage citizens in work in the administration. It involves creating a base of tasks and talents where workers can do selected jobs for the administration without committing permanently to a given unit (Government of Canada, 2018d). For the Canadian administration, this is a departure from the model of fixed office work, which can create flexible teams that meet concrete projects' needs. The programme was modelled on the successful *Free Agents* programme. In the first year after its launch, 42 recruitment projects in 20 departments were a success (OECD, 2018b, p. 71-74).

Build cloud-first is a CDS programme modelled on ones in Britain and the US that promotes the cloud as a cheaper and more efficient option for providing IT services. Since launching in 2016, its effects are already noticeable. Academic organisations like the Communications Research Center Canada have used the cloud to change how they conduct research. More users are using it to share the effects of their academic work. In November 2017, the Canadian government issued a directive on the safe use of commercial cloud services, which enables protected data to be stored in the public cloud.

Innovative Solutions Canada

While the CDS develops new solutions itself in cooperation with entrepreneurs and innovators, the ISC programme supports the development of SMEs by helping them present solutions in public orders announced in challenge-driven form. The programme aims to seek innovation where there is a lack of adequate market solutions (Government of Canada, 2019a). ISC has an annual budget of CAD 100 m.

So far, 42 challenges have been carried out thanks to ISC. Innovative proposals in the following areas have been sought: fighting environmental pollution (new forms of plastic recycling, removing rubbish from the water, facilitating the sorting of waste, searching for substitutes for plastic packaging of food products) and new technological solutions (high-energy lasers for the Canadian armed forces and night vision goggles for the emergency services). ISC places a special emphasis on the social aspect of its mission: attracting talent and encouraging

cooperation with the administration in the joint search for innovative solutions (Government of Canada, 2019b).

Australia

The Australian Digital Transformation Agency (DTA) was established in 2015 (Clarke, 2017, p. 7). On 18 May 2017, it took over responsibility for all public contracts for products and services in the ICT sector from the Ministry of Finance (Digital Transformation Agency, 2017b). Its main task is the digital transformation of the public administration: digital services should be simpler and quicker to use, save money and time, and help spread knowledge on the administrative features available online.

The DTA's work has made the following digital platforms available to users:

Tell Us Once – the administration's central database that registers changes in personal data (such as an address or telephone number) for numerous state institutions.

Notifications – agencies will be able to contact users via their preferred channel, such as email or text message.

Payments In – users will gain access to a simplified and consistent way of making payments to the government.

Federated Data Exchange – agencies will be able to swap data quickly and safely.

DTA found the contractors for these projects using the Digital Marketplace platform (Digital Marketplace, n.d.-a, n.d.-b, n.d.-c). Work on new features is underway. For instance, Tell Us Once exists in beta form; a prototype has been developed and is being tested (Digital Transformation Agency, 2018). The DTA's analysis has shown that implementing just these four government platforms could lead to savings of the order of AUD 100 m (Digital Transformation Agency, 2019).

Digital Marketplace

In the 2016/2017 financial year, the value of public procurement in Australia was over AUD 47 bn (64,092 contracts; Department of Finance, 2019). Government spending on products and services in the ICT sector is around AUD 6.2 bn per year. To improve the procurement procedure in this sector, a Digital Marketplace platform was established in Australia, modelled on the British solution (Digital Transformation Agency, n.d.). Between August 2016 and November 2018, the main areas of procurement on the platform were engineering and software development, user research and design, data science, strategy and policy (Digital Marketplace, n.d.-d).

In March 2019, 1209 entrepreneurs and 1754 units of the administration at all levels were registered on the platform[17]. Between August 2016 and February 2019, they made purchases worth AUD 363.6 m. 67% of contracts were to SMEs (Digital Marketplace, n.d.-d). Significantly, the number of contracts going to SMEs is rising. In 2017-2018, 74% of orders made using the platform, worth AUD 134 m, went to them (Digital Transformation Agency, 2017b).

Although it has not been around for long, the Digital Marketplace is widely used and effective. Almost one in two registered units in the Australian public finance sector has used it at least once. According to data from December 2018, every announcement published by the administration found a contractor on the platform, which means that it is 100% effective. In February 2018, 81% of users were pleased with how it works (Digital Marketplace, n.d.-d).

[17] The latest data can be checked here: https://dashboard.gov.au/dashboards/7-digital-marketplace [accessed: 29.03.2019].

67%

of public procurement
via Digital Marketplace went to SMEs

AUD 381.29 m

the value of public procurement
via Digital Marketplace since 29.08.2016

1255

registered ICT service providers

1437

opportunities for providers

New Zealand

As a member of the OECD E-Leaders and the Digital 9 (D9), New Zealand is one of the global leaders of the technological transformation of the administration. This is also reflected in programmes for the GovTech sector. As part of the "Better for Business" initiative, three Accelerator programmes focused on strengthening cooperation between the private sector and the administration have been carried out since 2015. Their aim was to facilitate cooperation between the government and businesses, including creating innovative solutions increasing the administration's efficiency and reducing the time enterprises spend on formalities in procurement processes (Little, 2018). As part of the programme, users received a New Zealand Business Number (NZBN), which allows for basic data on enterprises to be checked quickly and transparently, as well as a digital guide that makes it easier to navigate the agency's government pages.

Since mid-2018, New Zealand has had a Digital Marketplace platform. It aims to give the administration access to a broad catalogue of providers and their products. It is also supposed to be an effective tool for comparing offers. The platform features a security indicator required by the administration; all the products offered on the platform have it.

Austria

In September 2012, the Austrian federal government adopted an action plan concerning public procurement, which foresaw increasing the number and improving the quality of digital services for citizens, as well as activating entrepreneurs – providers of ICT products. The plan is being implemented by the Federal Ministry for Digital and Economic Affairs (Bundesministerium für Digitalisierung und Wirtschaftsstandort, BMDW) and the Federal Ministry for Transport, Innovation and Technology (Bundesministerium für Verkehr, Innovation und Technologie, BMVIT;

Austrian Institute of Technology, 2014). Another important entity when it comes to public procurement is the Federal Procurement Agency (Bundesbeschaffung GmbH, BBG), the government's central purchasing organ, which is linked to the Ministry of Finance. It provides services relating to public procurement for Austrian ministries, especially negotiating framework agreements for the government and other public entities.

Competence and contact centre for exchanging information on public procurement have been established at Austria's public institutions (Innovationsfördende Öffentliche Beschaffung (IÖB), n.d.) One of them is the PPPI Service Centre (IÖB-Servicestelle) operating as part of the central purchasing authority (BBG). It handles pre-commercial procurement and procurement of innovations for the Austrian public administration. It initiates pilot projects, conducts training for the administration and supports the Austrian innovative partnership platform www.innovationspartnerschaft.at, which is a unique combination of remedial tools, a Digital Marketplace platform and a centre coordinating challenge-driven competitions (IÖB Innovationsplattform, n.d.).

Estonia

Estonia is in the vanguard of the digital transformation of the public sector. This results from implementing breakthrough tech features, from digital identity in 2002 and i-Voting in 2005 to e-Health in 2008. One of its best-known innovations is the global e-residency system established in 2014. Non-Estonians around the world can register as "e-citizens", which allows them to open a bank account in Estonia and establish a company from anywhere in the world. The country currently has over 36,000 e-residents, who established over 3500 companies in 2014-2018.

The Estonian digital sector's strength is its thriving start-ups. Last year alone, Estonian start-ups raised over EUR 270 m in development capital. They are supported by a local venture capital financing network (in particular Ambient Sound Investments and Karma Ventures) and by numerous specialist accelerators (including StartupWiseGuys and Buildit). The main government support programmes for start-ups are SmartCap (managing EUR 40 m worth of starting assets) and Start-up Estonia.

> *"The Estonian government is a playground: when companies have a cool product idea, they can approach government to test it out in the public sector."*
>
> Siim Sikkut, Estonia's Government Chief Information Officer (Elliott, 2018b).

Estonia is considered a model for other EU member states when it comes to e-tenders. E-notification regarding proceedings on public procurement has been obligatory since 2001. Estonia also launched a positively-assessed central portal for public procurement with a series of functions, including e-notification, e-access and e-offers, as well as a broad range of information on the order and the process itself (European Commission, n.d., p. 64-69).

Singapore

Singapore's GovTech government agency was established in October 2016 after the restructuring of the Infocomm Development Authority (IDA; Rajah&Tann Asia, 2016). In Singapore, GovTech is part of the government's

Smart Nation initiative, launched in 2014 to use technology, networks and databases to create a series of technology-based solutions for citizens (Woo, 2018).

> **Intelligent + LED** – a programme for replacing 110,000 street lights with LED models equipped with a set of sensors implemented as part of the Smart Nation initiative. Lighting will be controlled using advanced software that receives sensor data, gathers information about the environment and improves the movement of autonomous vehicles. The contract is worth SGD 216 m. In March 2019, the project was at the testing stage (Loke, 2017).

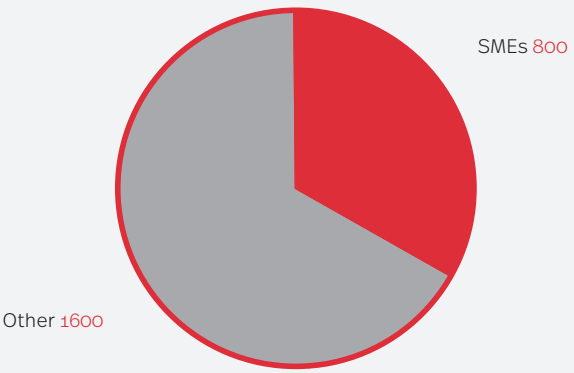
In Singapore, procurement of ICT services for the administration is based on agile methodologies. The country's GovTech carries out public procurement for ICT using spiral contracting. This involves implementing projects by dividing them into stages: prototyping, piloting and implementation. This process allows public entities to test the solutions proposed by the market during the tender process (Basu, Rohaidi, 2017). Cooperating with public entities, GovTech has implemented a range of digital services for Singapore's citizens, including:

Ask Jamie – this project, which began in 2014, aims to create a "virtual assistant" who will answer the public's questions in specific areas more quickly and easily (GovTech Singapore, n.d.).

GrabShuttle – this app launched on 2 March 2017 improves public transport. It allows travellers to make reservations and payments online, track buses in real time and choose the fastest route (Grab.com, 2017).

eCitizen Ideas! – this crowdsourcing platform aims to encourage citizens to share their ideas regarding new improvements, create apps and solve their problems (Ecquaria Technologies Pte Ltd., 2018).

↘ Chart 9. The Singapore government's spending on ICT contracts in 2017 (millions of SGD)



Source: prepared by the authors based on Kwang (2018).

Challenge-driven competitions are carried out using the government's "Ideas!" website. The authorities use it to organise crowdsourcing initiatives, such as competitions to develop apps and hackathons. All Singapore's government agencies can publish their challenges there (Ideas!, n.d.). The competitions are particularly addressed to SMEs, which are encouraged to present original solutions to problems that the country faces.

In 2017, Singapore dedicated SGD 2.4 bn to ICT contracts. One-third of this amount (SGD 800 m) went to SMEs (Kwang, 2017). The largest amount went towards orders involving data analysis, public digital systems, cybersecurity and implementing the Smart Nation programme.

CODEX

A significant GovTech Singapore initiative is the CODEX platform (re-engineering the government's digital infrastructure), which enables the administration to deliver digital services to citizens more rapidly. Thanks to CODEX, digital reusable components, including machine-readable data, middleware and microchips, are to be shared among agencies, giving developers easier access to their resources. It will also help reduce errors and improve the quality, reliability and safety of the services offered.

CODEX will allow Singapore's public entities to use commercial cloud services as well as software services and tools, enabling the administration to use the private sector's offer to develop digital services. A business grant portal using agile methodology, including a component called HATS (*Hive Agile Testing Solution*), used for the automatic continuous testing of new features, operates within its framework (Smart Nation Singapore, 2018).

Israel

Israel has achieved considerable success in developing new technology and innovation by promoting R&D and providing entrepreneurs with access to sources of funding. Israel's importance on the global tech map is illustrated by the number of Israeli companies on the NASDAQ stock exchange and Silicon Wadi's position as the second-largest centre for new technology and innovation after the Silicon Valley in California (Money.pl, 2019). In Israel, support for the development of technology for the administration goes back several decades. The subject is receiving considerable attention from a special unit, the Government ICT Authority (Israeli Government, n.d.), which promotes and develops digital services in the government administration. Its main purpose is to provide citizens with more accessible, innovative and up-to-date public services. An integral part of designing new government services is ensuring the protection of privacy and information security (Government ICT Authority, 2016, p. 4).

The government's actions when it comes to ICT are based on a few assumptions. One is Digital First (Government ICT Authority, 2016, p. 5). Government services are developed with preference given to digital services. Each new service is first developed as a digital service and only later, if needed, through additional service channels. This aims to provide universal access to comprehensive, user-friendly digital services.

The ICT Authority oversees all government units that provide services for citizens. Situated beyond the narrow administrative structure, it seeks to change awareness about the provision of services. In addition, its task is to manage information as asset components to ensure the credibility of government information (information on resources), as well as the modern management of all ICT departments. It combines the roles of an ICT authority, a knowledge centre and a professional consultant on ICT in the administration (Government ICT Authority, 2016, p. 7). Advanced digital services developed with the Government ICT Authority's support include (Government ICT Authority, 2016, p. 24):

Merkava – the government's enterprise resource planning (ERP) system, which aims to serve all government units on issues such as orders, resources, budget and real estate.

Gov.il – this platform aims to present all government services in a cohesive way. The previous platform directed users to individual administrative units' websites.

The challenge-driven approach to GovTech is popular in Israel. Competitions for solving problems submitted by public sector units are held as part of the government's Digital Leaders programme (Creatorspad.com, n.d.). It combines procurement and educational aspects; officials are prepared to strengthen the digital skills of the units they manage, including by preparing a challenge in which the solution will be funded by the central government. The challenges posed by the administration mainly concern improving the communication of information to citizens, the exchange of information between offices and the optimisation of public transport.

Selected solutions in other countries

The countries above are considered the leaders when it comes to GovTech, but the idea is not limited to them. Modern technology is being introduced in administrations around the world, with near features for citizens and more flexible procurement procedures.

Latin America

A series of advanced ICT solutions for companies and citizens are being implemented in Latin America (Santiso, 2019):

Argentina is developing the MuniDigital platform, which aims to improve municipal services by collecting and analysing data.

Columbia has developed *Datasketch*, which serves to analyse big data to create value for society.

Mexico is implementing the VisorUrbano app, enabling construction permits and business licences to be issued more quickly and efficiently.

Chile, Uruguay and Columbia are developing innovation labs as part of government structures, which will help design and accelerate non-standard solutions in specially adapted, favourable conditions.

The *BrazilLAB* initiative in Brazil, a non-profit GovTech Hub bringing together entrepreneurs and the public sector, investors and other partners, deserves special attention. The programme encompasses mentoring, access to the network and public leaders, solving local challenges and support in jointly building digital services provided by the government. A network of municipalities open to implementing innovative ICT solutions, including applying technology in the management process, has been established. Three editions of the programme have been held so far. In 2016, the challenges concerned education, sustainability and health. In 2017, the focus was communication, urban agriculture and finance. Last year's edition looked at the environment, health, public security and cyber security, as well as education in the field of entrepreneurship and management (BrazilLab, n.d.).

CityTech is one of the initiatives carried out in cooperation with *BraziLAB*. Its aim is to deliver AI tools for designing solutions for local communities, using information collected from residents and from public and government databases (CityTech, n.d.).

The Netherlands

An effective tool for finding new solutions for the administration is the Dutch *Startup in Residence* programme launched in 2015. It is a joint initiative by Startup Amsterdam and the city's Chief Technology Office (CTO), modelled on a similar programme in San Francisco. The challenges include improving waste management, use of green energy and use of public space. "Wild cards" allow participants to present the administration with a solution to an undefined problem[18].

During the competition, companies attend training supported by professional trainers adapted to their needs. The duration of the programme depends on the entity that publishes the challenges. They include Amsterdam (the programme lasts 6 months), the Ministry of the Interior (5 months), Overijssel (8 weeks of research, followed by a testing phase), the Ministry of Justice and Security (5 months), Amsterdam Metropolitan Area (6 months), The Hague (4 months), Groningen (6 months), South Holland (5 months), Utrecht (3 months), the Ministry of Defence (6 months) and North Holland (4 months). The sponsor of the challenge provides funds for developing a prototype of the solution. For the Ministry of the Interior and Kingdom Relations, it is EUR 25,000. The Ministry of Justice and Security offers EUR 32,000 and North Holland EUR 5,000-10,000 (Startup in Residence.com, n.d.).

The city of Amsterdam, which founded Startup in Residence, is particularly involved in developing the tech start-up ecosystem. It strengthens it through its own program (Startup Amsterdam), which operating 35 initiatives and projects that help involve talent and capital, as well as build a customer network, for newly created companies. Its long-term investments include the Coding for Amsterdam project, which aims to give children programming and other skills for the professions of the future. Project partners include Bomberbot, NewTechKids and ITRandsteden en CodeUur. The programme is supervised by the ABN AMRO Foundation, which provides the infrastructure for coding lessons. So far, it has provided schools with over 1500 laptops.

Germany

The initiative supporting the development of the GovTech market in Germany is Tech4Germany – a project bringing together talent that designs new innovative solutions for Germany. The programme lasts 10 weeks and participants receive a scholarship of EUR 3500. In 2018, challenges presented by two ministries were carried out within its framework (Ellwanger et al., 2018)::

The Ministry of Finance (Bundesministerium der Finanzen) asked for the Zoll-Auktione.de, the German administration's auction site, to be modernised. Numerous improvements and features have been added; for instance, it can now be used on mobile devices.

The Ministry of the Interior, Construction and Local Affairs (Bundesministerium des Innern, für Bau und Heimat) wanted a personal identification platform (*Nutzerkonto Bund*) established. A single user account facilitates access to online services offered by the federal administration.

Norway

In 2016 and 2017, Norway came second in the ranking of Europe's most advanced digital economies, according to the Digital Economy and Society Index (DESI). Big, competitive enterprises and numerous smaller, innovative ICT companies are based there. An important step towards expanding the Norwegian

[18] The list of challenges can be found here: https://startupinresidence.com/social-issues/ [accessed: 29.03.2019].

administration's catalogue of digital services was the opening of the Doffin website in 2014 (Hennyng, 2018). This is an online database for public procurement and services for citizens, including those related to public utilities (water, energy, transport and telecommunications). The website helps contracting authorities create and publish advertisements in line with legal provisions and makes it easier for suppliers to find competitions in the public sector. The database is widely used. All contracts for deliveries, work or services with an estimated value of over NOK 1.1 m are announced there.

The *Doffin* is run by the Agency for Public Management and e-Administration (Difi). It was established in 2008 as a subordinate unit of the Ministry of Local Government and Modernisation. The Agency's tasks include improving the government administration's efficiency, including by simplifying public procurement procedures and helping it obtain and use ICT tools in public sector management. Public procurement accounts for about 16% of Norway's GDP. Its annual value is estimated at over NOK 500 bn. In 2019, the Norwegian government plans to spend NOK 129.2 m on co-funding new ICT features.

GovTech in Poland

GovTech tools in public procurement (law and practice)

The public procurement procedure in Poland

Cooperation between the public administration and entrepreneurs is based on the institution of public procurement. These are public contracts concerning services, deliveries or construction work (Polish Public Procurement Law Act, 2004, article 2, point 13).

SIWZ and requirements concerning the subject of the contract

The ordering process begins with identifying a need and the specification of the essential terms of reference (SIWZ) by the contracting authority. It specifies the conditions that should be met by the economic operator, a list of elements that should be included in the offer and basic data (Public Procurement Law Act, 2004, article 36). The procurement procedure that envisages that the administration will draw up the SIWZ itself is ill-suited to the specificity of ICT procurement. It requires advanced technical knowledge, which the entity often lacks. As a result, the tool purchased may be poorly adapted to the administrations needs and may require costly and time-consuming additions. After determining the criteria, the contracting party publishes the contract notice. Despite increasing access to common and commercial databases that collect public contract notices, access to information is still a significant problem among small enterprises[19].

Subject criteria

The contracting authority determines the conditions for participation in the procedure and the required evidence (e.g. documents) that it will use to assess the contractor's capabilities to realise the contract (Polish Public Procurement Law, 2004, article 22 paragraph 1a). The contractor must first meet a number of formal conditions, only some of which are closely related to the contract. The contracting authorities often requite numerous formal documents, which means that less experienced entrepreneurs make mistakes. As a result, there is ample opportunity for individual entrepreneurs to be excluded from the entire procedure, even though they have the potential to realise the contract correctly, in accordance with the contracting authority's expectations (Polish Public Procurement Law Act, 2004, article 24).

Dates and the deposit

The Polish Public Procurement Law envisages a series of modes for awarding a public

[19] According to research by the Polish Agency for Enterprise Development (Polska Agencja Rozwoju Przedsiębiorczości, [PARP]) from 2012, lack of access to bids is particularly affecting small businesses. It was reported by 28% of micro, 26% of small and 15% of medium-sized enterprises. According to the PARP study, "(...) the natural explanation for the difference may derive from the size of employment – the dissimilarity in the enterprises' culture and organisational structure. Medium-sized entities have more opportunities to search for information on public procurement due to the greater number of employees they can involve. These enterprises are more likely to specialise towards the public procurement market (with departments dedicated to it) and therefore their employees can often operate exclusively oriented towards this market, while their colleagues at smaller companies probably have to split their responsibilities between the public procurement and commercial market" (Kowalewska, Szymańska, Pastuszak, 2012, p. 61).

contract, each of them with specific restrictions. In an open tender, companies have at least 7 days to submit offers; if the value of the contract is equal to or exceeds the amounts specified in the Minister of Development and Finance's regulation, they have at least 35 days. Although these are the minimum timeframes and the contracting authority has the right to extend them, in practice it is not interested in doing so, which makes it more difficult for entrepreneurs to prepare offers professionally and comprehensively. The contracting authority may also demand a mandatory deposit, a sum of money or other to secure the contract's implementation. The deposit may not exceed 3% of the order's value. The deposit is mandatory when the value of the order equals or exceeds the amounts specified in the regulation (Ordinance of the Minister of Finance, 2017).

The decision

Contractors then submit offers. From among them, the contracting authority selects the most advantageous one. Practice shows that quality criteria, such as innovation or ease of use, but also the distribution of risk between the contracting authority and the economic operator, are rarely considered (Stańczuk, 2014). Processing offers is subject to numerous requirements; often, the contracting authorities do not choose their own criteria for evaluating offers. They limit themselves to applying the examples set out in the act (Polish Public Procurement Law Act, 2004, article 91 paragraph 2), which means that they lack the flexibility to properly assess offers for ICT public procurement. After selecting an offer, the contracting authority signs a contract with the contractor (Polish Public Procurement Law Act, 2004, article 94) and announces the decision (article 95).

Modes of public procurement

The most commonly used public procurement procedures in Poland, which are poorly adapted to ICT orders, and formalisation, which impedes cooperation between public unites and SMEs, have not gone unnoticed by the legislature. Alongside the two basic modes of public procurement (open and restricted procedure), the law foresees a series of modes and special procedures, aiming to:

1. Simplify and streamline proceedings (a request for quotations, electronic bidding, negotiated procedure without publication),
2. Acquire knowledge that is unavailable to a public unit (competitive dialogue and negotiated procedure with publication),
3. Use agile methodologies in the administration (innovation partnership, awarding a contract following a contest).

From the GovTech sector's perspective, the latter two are especially significant. The first involves tools that open new communication channels between business and public sector units, enabling the best and latest solutions available on the market to be present. This increases the efficiency of ICT procurement. Citizens and the administration are more satisfied with the resulting features. The second group opens the way to cooperation with business when creating new solutions for citizens (joint development). Agile methods and the challenge-driven approach can be used here.

Preliminary market consultations

The preliminary market consultations are not a separate procedure and, unlike competitive dialogue, is only a preparatory phase preceding public procurement. It involves consultations with experts, public officials or contractors who advise or provide enough information to prepare a description of the contract or specify

the terms of the order or contract (Polish Public Procurement Law Act, 2004, article 31a, paragraph 1 and 2).

Entities involved in preliminary market consultations can then apply for a contract under certain conditions. As the literature notes, there is a risk that the description of the contract drafted under their influence will be limited to solutions offered by them (Zalewski, 2017). However, this is limited by the possibility of excluding entities involved in the preliminary market consultations from the proceedings, if that is the only way to prevent the distortion of competition due to their participation. The legislator imposes a series of obligations on the contracting authority, such as: including information on the use of preliminary market consultations in the contract notice, its impact on the description of the subject of the contract and the measures to prevent distortion of competition[20]. All these aspects mean that preliminary market consultations are not popular.

Negotiatiated procedure with publication

This is a special procedure for awarding a public contract, used when it is not possible to determine detailed features of the services ordered in advance due to their unavailability or innovative character. The contracting authority invites pre-selected economic operators to submit initial bids, which are followed by negotiations. After they are completed, the contractors submit final offers based on the SIWZ. From these, the contracting authority selects the most favourable one.

Contest

Contests aim to facilitate the awarding of public contracts. The contracting authority offers a prize for carrying out the contest work, which also involves the transfer of the right to it. The contracting authority may award the winner with cash or a prize in kind and invite it to negotiated procedure without publication (in this case, at least two authors) or to a single-source procurement procedure (Polish Public Procurement Law, 2004, article 111, paragraph 1). Despite its usefulness in ICT procurement, until recently contests were mainly used for tenders in spatial planning, urban design or architecture and construction. This changed with the launch of the GovTech Polska programme. Since 2018, it has been using contests to acquire innovative ICT tools for administration.

Innovation partnership

This aims to develop innovative products that are not available on the market and sell them later (Wachowska, Jastrząb 2017). It includes many elements characteristic of agile methodologies, including the ability to set intermediate goals and the freedom to determine the product's scope and features when the contract is being implemented (Węgrzyn, 2017b). The contracting authority may sign contracts with several economic operators, which then carry out research projects in parallel. The contractors are then selected; the one that has developed the best product moves on to the production phase. The first public entity in Poland to implement innovative partnerships was the National Centre for Research

[20] It is worth noting that the legislator, as part of the amendment to the act's provisions, decided to no longer indicate that contractors directly involved in preparing proceedings are not subject to exclusion from the proceedings, if these activities were carried out during technical dialogue. This change increased the risk for contractors that, by participating in technical dialogue, they may subsequently be excluded from proceedings or be obliged to demonstrate that their participation in the technical dialogue did not affect the competitiveness of the proceedings. See Polish Public Procurement Law, 2004, article 24 section 10; the so-called self-cleaning procedure.

and Development (Narodowe Centrum Badania i Rozwoju, NCBR), which used it to implement the Emission-Free Public Transport programme (Narodowe Centrum Badań i Rozwoju, 2018).

Use of the available tools

In ICT procurement, the problem is often not the law, but rather practice and how it is interpreted by the administration.

> *Developing an entrepreneurial mindset with public service leaders means building the skills to spot opportunities and the confidence to take action to add public value for citizens; lesson learnt: show me the law, not the rule.*
>
> Alexander Holt, head of CivTech Scotland (as cited in Crichton, 2018; Holt, 2019).

↘ Table 1. Percentage of orders by type in 2014-2017 (%)

Mode of procurement	Year / percentage of contracts			
	2014	2015	2016	2017
Open procedure	82.19	83.39	81.80	86.10
Restricted procedure	0.74	0.83	0.70	0.40
Negotiated procedure with publication	0.08	0.07	0.05	0.05
Competitive dialogue	0.01	0.01	0.01	0.02
Negotiated procedure without publication	0.21	0.13	0.10	0.14
Single-source procurement	13.42	11.75	13.42	9.67
A request for quotations	3.14	3.55	3.59	3.29
Innovation partnership	-	-	0.00	0.01
Electronic auctions	0.21	0.27	0.33	0.32

Source: Public Procurement Office (2018, p. 36).

In cases that require the development of new solutions or access to hermetic knowledge, contracting authorities can use special modes of negotiations where the subject and terms of an order can be added to and refined (Public Procurement Office, 2018, p. 125-126). Despite the broad catalogue, the available modes of action have little practical significance. According to the Public Procurement Office's data, in 2017 competitive dialogue was used in just a few proceedings – and innovation partnership just once. This makes the popularisation of existing SME-friendly procedures, and the search for new ways to improve ICT procurement for the administration, all the more important. This involves implementing

new mechanisms and best practice that have worked in other countries.

GovTech Polska – achievements so far

Poland is taking a series of steps to digitise the administration and modernise the public sphere. The Ministry of Digitisation's efforts to move from a paper-based Poland to a paperless one have brought many solutions improving citizens' interactions with the administration. Numerous "e-services" have been introduced, digital methods of authentication and identification have been implemented, cashless transactions have been increased, tax settlements have been computerised and cyber security have been improved, among other efforts. The rapid development of the digital services market in developed countries increases the need to provide Polish citizens with new, better features. With these rising expectations, it is particularly important that ICT procurement be improved. The first steps were taken in spring 2018, when the GovTech Polska team was established at the Chancellery of the Prime Minister.

The MinFinTech pilot programme

The pilot programme was carried out at the Ministry of Finance in 2017. As part of the *MinFinTech* programme, the ministry issued a challenge at the biggest stationary hackathon in Europe (HackYeah in Kraków, on 28-29.10.2017). The event's 246 participants tried to prepare an app that would find illegally-sourced electronics on auction websites.

In addition to prizes in kind and money (PLN 60,000 in total), the winners of the first stage qualified for the second stage of the competition, with a total of PLN 75,000 in prizes. Working with the National Revenue Administration, teams of programmers prepared software that can identify companies involved in VAT carousels. Both the winning apps were implemented in 2018. The first of these reduced the number of irregularities observed on auction websites by 70% between October 2017 and August 2018 (Sarnowski, Selera, 2018, p. 23). After the competition, eight of its contestants accepted jobs at the Aplikacje Krytyczne sp. z o.o. company, which is controlled by the Ministry of Finance.

This was the first project by the Polish public administration to use agile methodologies widely. During the first stage, communication with contestants was based on a business communicator (a channel on the Slack platform), where the administration's staff answered questions. During the second stage, there was regular communication through multiple channels.

> *It's a wonderful experience to present your own idea to solve a state problem and then see how it is transformed into reality, becoming another element affecting Poland's economic development.*
>
> Karolina Suślik, winner of the second stage of the *MinFinTech* competition.

↘ Table 2. The GovTech Polska – ***MinFinTech*** pilot programme

Organiser	Challenge	Winner	Prizes
Ministry of Finance (Stage I)	Developing a tool that finds illegally-sourced electronics on auction sites, traded as part of tax carousels	Team **Codeheroes**	PLN 60,000 in total
Ministry of Finance (Stage II)	Developing a tool to compile information retrieved from anonymised data banks to detect entities involved in VAT fraud	Team **Testowa** (in the business category) Team **PPP** (in the technical category)	PLN 75,000 in total

Source: prepared by the authors based on MinFinTech.gov.pl (n.d.) and Polish Press Agency (2017).

GovTech Polska's aims

GovTech Polska's aim is to find innovative solutions for the public administration and support its digitisation by improving the ICT procurement process. Conditions for fast and efficient cooperation between the public administration and innovators (start-ups, software houses, scientific institutions, foundations and creative individuals) need to be created. The programme aims to diversify the offer of ICT products for the administration by encouraging start-ups and SMEs to apply for government contracts.

GovTech Polska's task is also to promote innovative models of cooperation between the public sector and businesses internationally. The GovTech Polska team arranges study visits, along with webinars and consultations, for foreign organisations interested in using the model for ICT procurement being implemented in Poland.

Poland's Strategic Partners: Scotland, Austria and the United Kingdom

On 12 November 2018, a cooperation agreement between GovTech Pol-ska and CivTech Scotland was signed at the Polish Embassy in Paris – the first document of this kind in Europe. The cooperation will encompass supporting the introduction and use of new technology in Europe, while sharing knowledge, experience and best practice. Further agreements on supporting innovation were signed on 2 April 2019 with Austria's IÖB-Servicestelle (GovTech Polska, 2019) and on 2 July 2019 with the British Government Digital Service (Polskie Radio, 2019).

The GovTech Polska programme's main tasks are:

- supporting the search for innovative solutions to the challenges faced by Poland's public administration,
- developing effective models of cooperation between the public administration and innovators, and spreading them in the country and abroad,
- providing SMEs with equal opportunities ICT public procurement,
- setting directions for the development of an innovation ecosystem in the public sector.

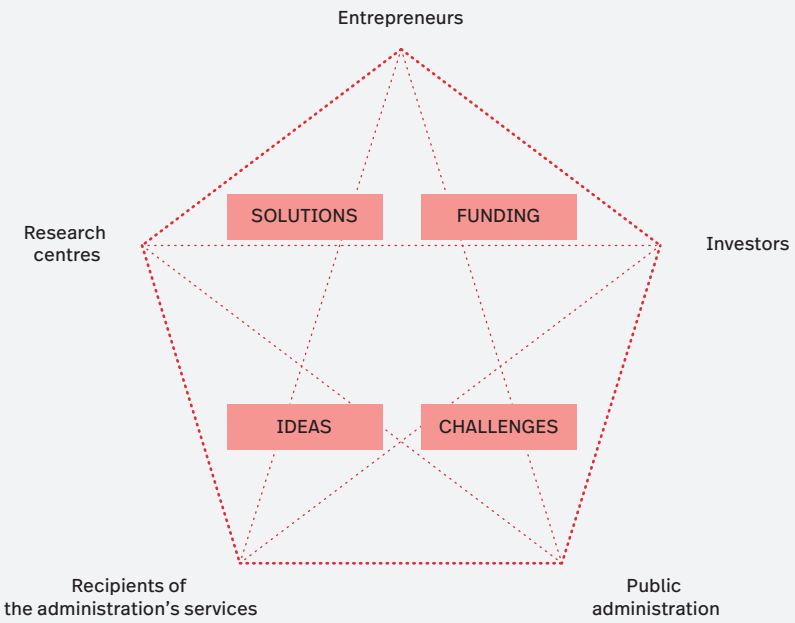
The GovTech Polska team and ecosystem

GovTech Polska is coordinated by an inter-ministerial team appointed by the prime minister, made up of ministers responsible for key aspects of Poland's digital infrastructure. In addition, within working groups, governmental and local governmental agencies that support enterprises and promote economic development based on the technological revolution cooperate with the programme. The programme also includes an ecosystem of supporting institutions from both the public (technology parks, entrepreneurial clusters) and the private sector (including Google, accelerators and co-working centres).

GovTech Polska competitions

The main tool for implementing GovTech Polska's tasks is organising competitions to find the best ICT solutions to problems identified by the administration.

↘ Illustration 2. The GovTech ecosystem



Source: GovTech Polska team's promotional material.

The competitions have two stages. First, contestants create a minimal version of the solution (Proof of Concept), which is assessed in terms of its potential effectiveness and feasibility. The best proposals qualify for the second stage, where authors create a prototype. The first stage lasts two or three weeks and the second around four weeks, but the competitions are very flexible, accounting for each project's individual character. The prototypes are assessed by the Competition Jury, which chooses the best one. Its authors sign a full contract for implementation with the ordering party.

The pillars of GovTech Polska competitions

1. **Modular orders** – the challenges only concern the order's creative component. They do not seek what the administration can do itself or order the traditional way.
2. **Challenges rather than specifications** – the administration only specifies the product's purpose. The entrepreneur offers the tools, technology and solutions.
3. **Agile methods** – the administration cooperates with the entrepreneur at every stage of the process. They create and test innovative solutions together.
4. **One-stop shop** – winning the competition is tantamount to winning the tender for implementing the product. New features are implemented by the people who know them best – their creators.

Modular orders

Orders are carried out using a modular formula; a form of micropurchasing. Challenges are formulated so that they only apply to a feature's creative component. The less risky mechanical component, which can be implemented using a standard procedure or internally, is separated from it. This makes the procurement process more attractive for SMEs.

Challenges rather than specifications

The competitions are challenge-driven, which does not limit entrepreneurs' inventiveness. The ordering party merely defines the solution's functional requirements. Its technical parameters are only defined later, while the entrepreneur and the administration are working together.

Agile methods

Agile methods are key to a quality product. Entrepreneurs work closely with the contracting authority at every stage of the process, from identifying a need to market consultations (technical dialogue) and both stages of the contest, until the winning solution is implemented.

One-stop shop

After the contest is won, both the winning solution and its implementation become the subject of a public contract almost

automatically. This is a significant improvement compared to challenge-driven contests in other countries, which force contracting authorities to launch a separate tender for implementing the purchased product. This creates a risk that a different will be responsible for implementing the ICT product, which, for innovative tech solutions, significantly reduces the probability of that this will be done quickly and correctly. The one-stop shop developed in Poland is a considerable simplification for entrepreneurs and administrators, shortening the time in which it delivers new, efficient features to citizens.

Contests as part of the GovTech Polska programme assume cost neutrality. The order is no more expensive than a traditional one; indeed, the higher-quality product and lower risk make it cheaper.

The GovTech Polska contest model was created with scalability in mind, both in Poland and abroad. The programme can be adapted to the needs of big institutions, such as ministries, but also smaller entities, including local governments and regional branches, for which a special, simplified procedure has been developed. To make it easier for public institutions to use the model and conduct their own competitions, *Best Practices for Acquiring Innovative Technological Solutions by Competition Procedure* were prepared (GovTech Polska, n.d.-a). It sets out the key elements of the GovTech Polska contest procedure and related experience. Based on the description in it, the competition can be divided into three stages:

→ STAGE 0 Part 1 – The problem

The first step, before the contest begins, is to define the needs of the administration that can be satisfied with the technological solution. Officials check whether there is no existent solution that can be used.

→ STAGE 0 Part 2 – The challenge

Certain details of the challenge necessary for the contest to begin are specified, such as the contest's value and the criteria for entries. Consultations using technical dialogue are recommended, to check the challenge's technical feasibility. These allow the contracting authority to make sure that the challenge is feasible and set the final criteria for assessing entries.

→ STAGE I – Brainstorming

The first stage opens with the publication of a contest announcement in the Public Procurement Bulleting / EU Journal of Laws. GovTech Polska also recommends that the information be spread via other channels, including social media and industry media, conferences and trade fairs.

At this stage, contestants:

1) apply to participate in the contest, with a declaration on no grounds to be excluded and another on meeting the conditions (if the ordering party provides any),
2) present a conception of the solution – after the applications are assessed and they are invited to submit their work.

The result of work at the first stage is:

a) Proof of Concept (POC), such as a programme that works on a narrow sample of prepared data or an app with just some of its features. The aim is to demonstrate the contractor's skills and its idea's effectiveness;
b) a presentation or other document containing a vision of the completed solution.

The contracting authority selects that contractors that it will invite to stage II.

→ STAGE II – Choosing the best project

The best project contains the solution that meets the contracting authority's needs, restrictions and other circumstances to the greatest extent. GovTech Polska recommends fully or partly reimbursing the cost of creating the project for contestants who qualify for stage II. This stage culminates in the selection of the winning project, whose author is invited for negotiations.

Other solutions distinguished by the jury might be awarded prizes.

→ STAGE III – Implementation

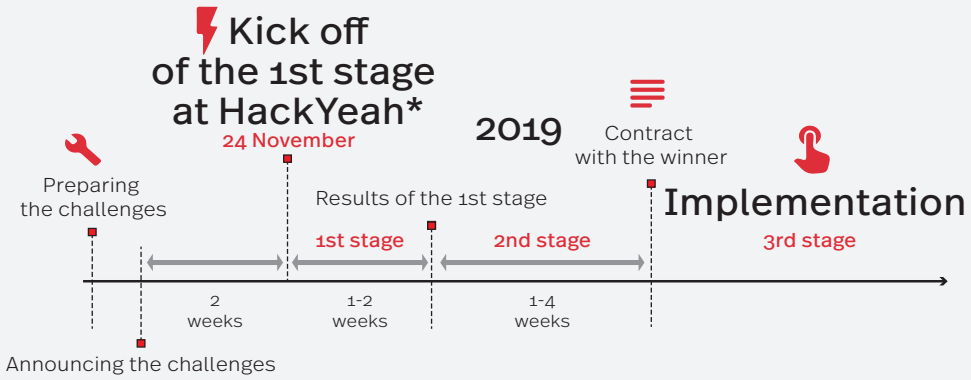
The winner's prize is being invited to negotiations, as part of single-source procurement (Polish Public Procurement Law, 2004, article 67 section 1 point 2 in conjunction with article 111 paragraph 1 and 2). The order concerns detailed development of the contest project; preparing an app and implementing it, confirming in a production environment that the app works and possesses the features expected by the contracting authority.

GovTech Polska's first edition

The first edition of GovTech Polska's contests was held in 2018. There were five challenges. Four ministries (Digitisation, Finance, Entrepreneurship and Technology, and Health) submitted problems, along with the town of Świdnik. The challenges concerned matters like the abuse of healthcare settlements, interactive maps of the state of digital skills and creating a database based on zettabytes of data. Each of the authorities received 50 unique submissions, on average, over a dozen times more than the average number of applications in public procurement. SMEs were well represented among the contestants and the winners. The programme's impact was not limited to the development of high-quality ICT products. Świdnik received a distinction in the 9th Smart City Forum competition for implementing an innovative solution for combating pollution developed in the GovTech Polska competition[21].

> *I am very pleased that the Smart City Chapter appreciated us. It is a great distinction. It shows that we have chosen a good road for dealing with key problems faced by our city.*
> Ewa Jankowska, secretary of Świdnik (Świdnik, 2019).

↘ Diagram 4. Timeline of first edition of GovTech Polska competition



* HackYeah is a physical meeting between ordering parties and potential contractors, aiming to answer any questions from potential participants.

Source: own study.

[21] http://smartcityforum.pl/laureaci-konkursu-smart-city-za-rok-2018/ [accessed: 29.03.2019].

↘ Table 3. The first edition of GovTech Polska

Ordering party	Challenge	Winner	Prizes
Ministry of Digitisation	Finding an optimal and efficient way to identify signs of citizens' activity online and connect them to receive an image of their digital skills. The data layers must be presented on a map of Poland and digital literacy must be shown over time	**DataWise** (Warsaw)	PLN 27,000 in total Budget for implementing the prototype PLN 110,700
Ministry of Finance	Creating an app for the Customs and Fiscal Service, which uses X-ray images to distinguish between everyday objects and dangerous ones (or those being transported illegally). The system should automatically and quickly identify objects in photos taken by X-ray devices. The app must also have a learning function to increase its effectiveness with each scan	**Tesorflight** (Białystok)	PLN 60,000 in total Budget for implementing the prototype PLN 600,000
Ministry of Entrepreneurship and Technology	Creating an intelligent tool enabling officials to quickly and efficiently navigate one of Poland's largest databases, belonging to the Ministry of Labour and Social Policy, which contains various types of files (doc, pdf, ppt, xls, jpg, scanned letters) distributed on individual employees' computers, at departments and on SMB servers. The system should allow officials to search the database and share knowledge quickly	**BI Insight** (Warsaw)	PLN 40,500 in total Budget for implementing the prototype PLN 365,700
Ministry of Health	Creation of a system for detecting fraud in the settlements of health services financed from public funds based on up-coding and unbundling, which involves detecting rates higher than the cost of the services performed. This practice is used by dishonest suppliers wishing to receive higher remuneration than that negotiated	The results have not been announced yet	PLN 25,000 in total Budget for implementing the prototype PLN 300,000
Świdnik	Increasing the effectiveness of detecting irregularities in fee declarations in municipal waste management. Once per quarter, an Excel spreadsheet should select the addresses of flats where an inquiry ought to be sent	**RapidSoft Sikora Wróbel** (Gliwice)	Budget for implementing the prototype PLN 20,000

Source: prepared by the authors based on GovTech Polska (n.d.-b)

GovTech Polska in 2019

In 2019, GovTech Polska's model of using contests to obtain innovative ICT tools for the administration is expected to be applied on a larger scale. A series of changes to the law on public procurement are foreseen, which will make the process less formal and make it easier for SMEs. They will include limiting the catalogue of obligatory reasons to exclude competition participants, increasing the freedom of authorities to limit the requirements for contractors and require the use electronic communication in the procurement procedure. As a result, entrepreneurs will be able to save time on the formalities and focus on developing solutions. Formal requirements will not appear until after the contest is completed and will only apply to the winner.

The GovTech programme's goals in 2019 include:

1. significantly increasing the number competitions organised using the GovTech Polska model,
2. developing the country's GovTech ecosystem, especially by creating a network of SMEs open to cooperating with the public sector,
3. promoting the use of the competition procedure characteristic of GovTech Polska abroad.

↘ Diagram 5. Timeline of second edition of GovTech Polska competition

Source: GovTech Polska team's promotional material.

Conclusions and recommendations for Poland

General remarks

The GovTech Polska programme positions Poland as one of the countries institutionalising actions to develop technology in the public sector. The actions taken so far concentrate on promoting the GovTech sector among Polish entrepreneurs and innovators. The flagship initiative is organising a cycle of contests to solve problems submitted by units of the public administration – challenges in how the public sector operates. This fits a wider trend of seeking ways to streamline the process of finding modern tech solutions for the state, especially innovative ICT solutions for the public sector.

The contests organised by GovTech Polska are based on a challenge-driven approach to the administration's problems. This means that the process of seeking solutions is taken beyond the administration, to entrepreneurs and innovators, who can propose solutions in a free and creative way through competitions. The Polish solution follows in the footsteps of similar initiatives abroad – Scotland's CivTech, Britain's GovTechCatalyst, the US's Challenge.gov and Canada's Innovative Solutions Canada Program. Poland has not only implemented solutions verified in a series of developed countries, but also improved them, automatically making the winning solution and its implementation the subject of a public order. This is a response to the problem, identified in the countries above, of having to organised another tender for the implementation of the winning feature, which – if a different company wins it – can lead to errors and delays.

The Polish programme has developed rapidly, producing high-priority solutions. After a single contest in 2017, five entities (four ministries and one town) took part in the first edition of the GovTech programme in 2018. In 2019, the programme's scale is expected to increase severalfold. Moreover, the features it has developed are highly significant. They include software for sealing the tax system or increasing the efficiency of the cargo control system in largest container port on the Baltic Sea. Initiatives sharing Polish solutions with other countries are especially valuable. The first step was the agreement with Scotland signed in November 2018.

Poland's efforts to streamline the process of delivering innovative solutions for the administration are an example of the introduction of new, best practices into how the administration operates. Extended, they could constitute a key factor improving the efficiency of ICT orders for public sector units. Other countries' efforts show that there is considerable potential to develop initiatives supporting the Polish GovTech market.

Organising contests for selected problems of the administration is a way to find innovative solutions, ICT products that are not available on the market or those that require elite knowledge and experience to order. It is just one element supplementing the broader, institutionalised process of supporting the GovTech sector. Poland should consider implementing a tech public procurement platform, modelled on solutions in Britain and Australia (*Digital Marketplace*). The platform should be part of a system focused on developing the GovTech market and ecosystem in Poland, with solutions dedicated to each of its entities and stakeholders: the

administration, citizens, entrepreneurs, investors and researchers.

For the GovTech programme to succeed, the market needs to be structured appropriately, supported by business and investment. In Poland, there is a lack of institutionalised investors with skills relating to the products and services delivered to the public administration and an investor-friendly process of cooperating with the public sector. This could be because innovativeness is low among Polish entrepreneurs. As the OECD has shown (Goujard, Guérin, 2018), the capital market in Poland is weak and investments focus on implementing existing technology, rather than innovation, which weakens the prospects for future increases and development of innovation, including innovation for the administration. The development of the GovTech initiative must be coupled with engaging market participants, especially entrepreneurs and investors. Without them, an adequate backdrop for the programme cannot be built.

Conclusions for individual features of GovTech

Digital Marketplace

Poland should establish a platform facilitating ICT public procurement in an institutionalised way. The Digital Marketplace platforms in Britain and Australia can serve as a model. Procedures must be simplified and unnecessary formal requirements bypassed. The purchasing platform must be adapted to the specificities of ICT contracts. This means that the tender process, forms and interface of the platform should correspond to the specific features of ICT services. They must not restrict the freedom to present important elements of the offer; rather, they must provide the necessary flexibility. At the same time, the support of ICT experts is needed, to assess the submitted proposals and advise officials on technical matters. Their remuneration must reflect rates on the market, so that the assessment is made by high-class specialists from various ICT sectors. Companies applying for public tenders must also receive feedback via the purchasing platform on why their offers were rejected. For smaller enterprises, the educational value of participating in a tender procedure is as important as winning it.

Spreading the competition procedure

Despite their rapid development, the competitions organised by GovTech Polska still take place on a modest scale. Competitions should be promoted as at formula that is accessible, simple and beneficial for a wide spectrum of public administration units. GovTech Polska should have the potential to help administrative authorities identify the problem correctly and organise a competition, assess solutions and apply them. It should also connect administrative bodies facing similar problems, helping them join forces to organise a joint competition. It must also ensure an adequate level of funding for key ideas submitted as part of the competition. In addition, the GovTech Polska programme should be able to freely interact with foreign entities with similar aims and competencies, exchanging knowledge with foreign partners. This also means support for signing international agreements at various levels, improving the process of knowledge exchange, implementing the best solutions in Poland and sharing experiences. GovTech contest procedures could also be popularised through partnerships with developing countries, helping them build their own organisations for obtaining ICT products and organising competitions for developing the features that they are looking for.

Finding new tools for improving public procurement

Public procurement is dominated by big entities with adequate staff and infrastructural

support, which enable them to meet the complex requirements of public procurement law. Yet solutions offered by the biggest companies can be more expensive and of lower quality than those proposed by smaller ones. Smaller enterprises are often incapable of delivering a product for the administration in a complicated public procurement procedure by themselves or are unaware that they can apply for that kind of order.

One solution worth considering is using AI-based tools to help identify potential contractors in particular areas of ICT services. The tool could operate similarly to Tenderlake Genius (Tenderlake.com, 2018), but for the public administration, rather than entrepreneurs. It would use AI to analyse the administration's documents and entrepreneurs' data, such as their websites, social media, industry portals or documents submitted in other tender proceedings. This kind of tool could be developed in one of the programme's subsequent editions. It would be the first time in Europe in which a GovTech organisation acts simultaneously as an ordering party.

A tool helping the administration seek contractors among smaller companies would enable it to invite a broad spectrum of companies to apply. The tool should also help connect suppliers that can only deliver part of the order, as a potential consortium. If smaller enterprises form groups that can offer the administration complex solutions, it is less likely that the task will be entrusted to a company with less staff or infrastructural support, while providing cheaper access to highly-qualified specialists who use innovative solutions. The tool could also be used as part of the Digital Marketplace platform or in contests for innovation.

GovTech Polska's efforts largely concentrate on increasing smaller enterprises' participation in tech public procurement. Its tasks are therefore in line with those of Poland's spokesman for SMEs, who was appointed in 2018. GovTech Polska should work closely with him on their shared goals. An advisory board made up of representatives of small and medium-sized enterprises chaired by the spokesman for SMEs and the director of GovTech Polska should be considered. Its task would be to support initiatives that help increase smaller contractors' access to public contracts, especially ones involving tech[22].

The public administration's specialisation when it comes to tech orders should also be encouraged. ICT public orders are so specific that special actions here are justified. In Britain, the GDS can review and accept or reject planned spending on digitisation and tech when it comes to larger amounts (Digital and technology spend controls (version 5), 2019). Poland should consider granting a specialised unit in the administration similar powers.

Table 4 contains an overview of further features that could be applied in Poland.

[22] A similar advisory body is run by the British Small Business Crown Representative (Crown Commercial Services, 2016).

↘ Table 4. Selected GovTech features that should be implemented in Poland

Type of tool	Poland	Country and feature
Purchasing platform	None, when it comes to ICT services. The first initiative could be the e-catalogue platform run by the Public Procurement Office, which is being made available and developed (E-katalogi, 2019).	Britain and Australia Digital Marketplace helps the public administration find tailored, competitive ICT services and buy them quickly with minimal formalities
Challenge-driven initiative	During contests, selected companies will get funds to develop their ideas	The United States, Britain, Scotland, Canada and Israel Challenge.gov was launched in the US in 2010, resulting in solutions to around a thousand challenges faced by the administration. Entrepreneurs have received prizes worth over USD 250 m in total.
Micropurchasing	The directive on dividing the order into parts results from the law (Public Procurement Law, 2004, article 36aa), but its application does not meet the requirements of agile ICT procurement.	The United States Orders are divided into smaller parts, which enables smaller companies to apply for them.
Secondment for innovation	None	The United States Officials cooperate temporarily with innovators and small companies, getting to know and implementing tools and best practices characteristic of the business sector in the administration
ICT consultants' help when preparing an order	There is a legal basis for using consultants in the public procurement process (Public Procurement Law, 2004, article 21 paragraph 4), but in practice this option is not used often enough in ICT orders	The United States USDS cooperates with agencies to identify and eliminate gaps in their ability to design, develop and run improved services for citizens. Over 200 staff are employed at various agencies
Supporting services for the administration based on cloud technology	Use of the cloud is not widespread	Britain and Canada The cloud first principle: units of the administration must consider and fully assess potential solutions in the cloud before seeking alternative IT services. The can only choose other solutions once they prove that they offer better value than cloud-based services.

Source: prepared by the authors.

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