

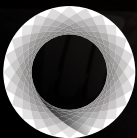


UNIVERSITY OF  
CAMBRIDGE

# Thinking about GovTech

A Brief Guide for Policymakers

By Tanya Filer



**Bennett Institute  
for Public Policy**  
Cambridge



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## About the Bennett Institute

The Bennett Institute for Public Policy at the University of Cambridge was founded in 2018 with the ambition of becoming a world-leader in achieving successful and sustainable solutions to some of the most pressing problems of our time. It draws on the world-class strengths of Cambridge in technology and engineering and social and political analysis to tackle some of the most complex aspects of public policy this century. The Institute has at its heart a commitment to deep analysis of the economic, social and political systems in which policy is developed; the creation of powerful new networks of policy-makers, influencers and researchers; and the development of a new generation of reflexive and critical policy leaders.

## About the Digital State Project

States around the world are responding in diverse ways to the disruptive power of digital and new technologies. As users, developers, procurers, and regulators of these technologies, they have a crucial role to play in determining whether the digitisation of government, society and the economy will produce more or less stable and equitable futures. The Digital State project sets out both to lead policy research and provide a forum for broad-ranging discussion on the opportunities and challenges that these technologies pose to policymaking, governance and democracy. It aims to meet this objective through an expanding suite of work, initially addressing the emergence and governance of GovTech; and strategies for improving technological knowledge and receptivity in public sectors globally.

## About the Author

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**GovTech is an emergent innovation ecosystem in which private-sector start-ups and innovative small and medium enterprises (SMEs) deliver technological products and services, often using new and emerging technologies, to public sector clients. Many GovTech companies work on challenges presented by emergent policy areas, or on problems where no solution was previously imagined as technically possible. The priorities of the GovTech ecosystem include improved efficiency and greater accountability in the public sector and its interactions with citizens. Building trust across the diverse stakeholders in the ecosystem is crucial for developing a thriving GovTech industry to serve the domestic public sector and to contribute to national economic growth.**

# Abstract

Governments around the world recognise an urgent need to move away from expensive, bloated IT contracts, and to serve citizens with greater efficiency and accountability. If carefully shaped, the emergent GovTech ecosystem, in which start-ups and SMEs provide innovative technology products and services to public sector clients, can contribute to achieving these objectives. This guide introduces the concept of GovTech. It further identifies eight activities that policymakers can undertake to foster national GovTech innovation ecosystems and to steer them towards positive outcomes for citizens and public administrators. It advises policymakers to

1. **Build the social and technical foundations for GovTech:** Ensure that the basic conditions are in place for GovTech to thrive and enjoy public support, including public digital infrastructure, cybersecurity, universal Internet access, and universalism in access to online public service provision.
2. **Embed expectations of accountability at an ecosystem-wide level:** Promote a joined-up vision of accountability, particularly when handling citizens' data, across the ecosystem and consider setting industry standards to ensure that it is observed.
3. **Address GovTech procurement barriers:** Facilitate the process of small, innovative technology companies selling to government. Communicate to non-traditional providers with clarity and seek to build trust with them throughout the procurement process.
4. **Ensure the provision of appropriate, and often patient, capital:** Consider the possible long-term outcomes of different financing mechanisms, and plan government funding and incentivisation schemes accordingly.
5. **Engage academia at each stage of the GovTech innovation lifecycle:** Draw on the multidisciplinary capacities of universities to build human capital; enable knowledge transfer and access to new ideas; develop technological spin-offs that convert research into high-value commercialisation ventures; and provide support on ethics and governance.
6. **Develop pipelines of technological talent, emphasizing public sector problems and opportunities:** Learn from cyber security education programmes and consider a holistic range of engagements to build interest among technically skilled young people.
7. **Build translator capacity within the public sector:** Ensure that public sector agencies and departments are equipped to converse at the intersection of technology and public policy, including with GovTech companies.
8. **Develop and utilise regional and international networks:** Engage regional and international networks both to learn about innovations elsewhere and to assist domestic GovTech companies with internationalisation, contributing to economic growth.

# Part 1.

## An Introduction to GovTech

# Introduction

**Governments around the world are nurturing the growth of domestic GovTech, or government technology, innovation ecosystems.** GovTech' continues to evade a single definition but its core mission is broadly understood to be making public sectors more innovative, efficient, and responsive through the use of digital and emerging technologies provided principally by start-ups and innovative small or medium enterprises (SMEs), including 'scale-ups'.<sup>1</sup> For governments, the growth and sustainability of a domestic GovTech ecosystem holds a double allure: the possibility of renewing the domestic public sector at a moment where governments around the world are at a point of institutional crisis; and the promise of economic growth as the global GovTech market courts valuations of \$400 billion annually.<sup>2</sup>

**The emergence of GovTech strikes at the core of contemporary challenges of governance.** Amid rapid technological change and deepening inequality, citizens are demanding of their governments better public services and more meaningful forms of participation. These demands occur against a backdrop of budgetary constraint in many countries, creating a strong efficiency imperative.

Many public institutions are falling short.<sup>3</sup> Their deficiencies are amplified as citizens compare their often-sluggish interactions with government bureaucracies to the efficiencies of the platform economy. At the same time, a prevalence of disastrous, expensive IT projects points to a profound lack of government oversight in private-sector partnerships, indicating carelessness, lack of capacity, or even corruption. These technology-related failures fuel the disenchantment in the institutions of government that grips many countries today. It is thus incumbent upon policymakers to reconceive how they buy, use, and regulate the technologies of twenty-first century governance.

**This guide is premised on the belief that GovTech innovation ecosystems can be a vehicle for better technological usage by the public sector and a fairer distribution of the financial benefits of government technology contracts.** To achieve these positive objectives, accountability must be embedded at an ecosystem-wide level from the outset.<sup>4</sup> Policymakers have a key role to play today in fostering GovTech innovation ecosystems and steering them towards beneficial outcomes.

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1 Large enterprises and non-profit organisations can also supply innovative technologies to the public sector. The French Startup d'État programme promotes public sector 'intrapreneurship'. This report acknowledges the role of these alternative GovTech vehicles but focuses on start-ups and innovative SMEs as the principal unit of GovTech delivery in many economies. Because firm growth can be linked to innovation, innovation-oriented SMEs may be 'scale-ups', experiencing growth in terms of employees or turnover. 'Enabling SMEs to Scale up: Discussion Paper' (OECD Ministerial Conference on Small and Medium-sized Enterprises, Mexico City: OECD, 2018), <https://www.oecd.org/cfe/smes/ministerial/documents/2018-SME-Ministerial-Conference-Plenary-Session-1.pdf>, p. 7.

2 Ron Bouganim, 'GovTech: The \$400 Billion Market Hiding in Plain Sight', 2016, <http://GovTechfund.com/2016/01/GovTech-the-400-billion-market-hiding-in-plain-sight/>.

3 On New Public Management, a management philosophy prevalent in public sectors in the 1980s and 1990s that encouraged large-scale outsourcing and contributed to gutting governments of internal technology expertise see Helen Margetts, 'E-Government in Britain—A Decade On', *Parliamentary Affairs* 59, no. 2.1 (2006): 250–65, <https://doi.org/10.1093/pa/gsl003>; Patrick Dunleavy et al., 'New Public Management Is Dead—Long Live Digital-Era Governance', *Journal of Public Administration Research and Theory* 16, no. 3 (July 2006): 467–94, <https://doi.org/10.1093/acprof:oso/9780199296194.003.0009>.

4 Tanya Filer, 'It's Time to Make GovTech Work for the Public, Not Just Technocrats', *Wired*, 16 April 2018, <https://www.wired.co.uk/article/its-time-to-make-GovTech-work-for-the-public-good>.

## GovTech Innovation Ecosystems

**GovTech innovation ecosystems constitute the dynamic interaction of individuals, organisations, and resources that create, buy, use and regulate GovTech products and services (Illustration 1).** Across the world, these ecosystems are in their nascent stages, with civil servants, politicians, entrepreneurs, investors, consultants and multi-lateral organisations promoting GovTech as both an economic opportunity and a vehicle for boosting the innovative capacity of government. This interest has led to the development of GovTech-focused policies, programmes and investment portfolios, many of which are led or supported by national governments.

**Despite these advances, GovTech is still young as both a policy domain and an industry.** Firm-level success stories, expertise, and international knowledge diffusion remain limited. On a global scale, many governments actively seek guidance on how to nurture the

growth of a local GovTech ecosystem that both supports specific national needs and draws on relative advantages. This guide responds to that call.

*Thinking about GovTech aims to identify and explore core policy areas that policymakers must consider in order to develop sustainable and accountable GovTech innovation ecosystems.* It also notes what GovTech is not, and where its use is unsuitable (see R2). Innovation is a term that appears throughout. While 'innovation' crops up frequently and amorphously in conversations about government digitisation, it is used here with two specific meanings in mind: to refer to those ideas, products, and services that are 1) new altogether OR 2) whose general uptake or specific application in the public sector is new. In the second case, the innovation lies in the adoption. Innovation is, furthermore, used here in a positive sense, focused on newness that may genuinely benefit society. Dividing GovTech into five (sometimes overlapping) subcategories—administration, digital

### ILLUSTRATION 1. The GovTech Innovation Ecosystem



\*Represents the principal organisations and individuals but is non-exhaustive. Main subcategories in grey. 'Champions' are high-level sector advocates.



## ILLUSTRATION 2. GovTech Subcategories



### Administration

Informat (Portugal) offers forest management technologies  
SceneDoc (US) helps police collect evidence and compile paperwork



### Digital Infrastructure

Redox (US) tackles interoperability in healthcare



### Public Service Provision

AID.Tech (UK) enables welfare provision & fraud prevention through digital IDs and blockchain storage  
Healthmatch (Australia) connects patients with clinical trials



### Participation

Votem (US) provides a mobile blockchain platform to enable voting online and from smartphones  
insights.US (Israel) uses AI & NLP algorithms to analyze and respond to citizens' feedback



### Regulation

TrackBill (US) allows governments to track and communicate updates on legislation to key stakeholders  
ArchiveSocial (US) helps governments comply with social media archiving requirements

infrastructure, service provision, participation, and regulation—helps to identify the specific benefits that its technologies can offer (see Illustration 2).<sup>5</sup>

**Reviewing current international policies and programmes and consulting policymakers, entrepreneurs, and investors engaged in GovTech development has led to the identification of eight activities that will be critical to effective GovTech policy design and implementation in many countries.** *Thinking about GovTech* counsels policymakers to:

- 1. Build the social and technical foundations for GovTech:** Work towards ensuring that the basic conditions are in place for GovTech to thrive and enjoy public support, including public digital infrastructure, cybersecurity, universal Internet access, and universalism in access to online public service provision.
- 2. Embed expectations of accountability at an ecosystem-wide level:** Promote a shared vision of accountability, particularly when handling citizens' data, across the ecosystem and consider setting industry standards to ensure that it is observed.
- 3. Address GovTech procurement barriers:** Facilitate the process of small, innovative technology companies selling to government. Communicate with clarity and seek to build trust pre-procurement and during procurement.
- 4. Ensure the provision of appropriate, and often patient, capital:** Consider the possible long-term outcomes of different financing mechanisms, and plan government funding and incentivisation schemes accordingly.
- 5. Engage academia at each stage of the GovTech innovation lifecycle:** Draw on the multidisciplinary capacities of universities to build human capital; enable knowledge transfer and access to new ideas; develop technological spin-offs that convert research into high-value commercialisation ventures; and guide on ethics and governance.
- 6. Develop pipelines of technological talent, emphasizing public sector problems and opportunities:** Learn from cyber security education programmes and consider a holistic range of engagements to build interest among technically skilled young people.

<sup>5</sup> GovTech can also usefully be divided into government functions or policy domains. For example, see 'GovTech: Europe's next Opportunity' (Accenture & PUBLIC, 2018), p. 9.

7. **Build translator capacity within the public sector:** Ensure that public sector agencies and departments are equipped to converse at the intersection of technology and public policy, including with GovTech companies.
8. **Develop and utilise regional and international networks:** Engage regional and international networks both to learn about innovations elsewhere and to assist domestic GovTech companies with internationalisation, contributing to economic growth.

**Each activity is crucial for creating the conditions in which GovTech can flourish, but its specific, local interpretation will necessarily vary from one country to another.** Such an approach to this guide is encouraged: it is not intended as a blueprint, but instead as a source of idea generation for policymakers and other GovTech stakeholders as they forge local ecosystems. The comparative analysis of selected international cases is intended to inform the design at the local level of policies and programmes associated with each activity.

**A key recommendation in this guide pertains to the funding of GovTech ventures** (see R4). It is widely acknowledged that high-risk technology industries focused on solving large-scale public problems require investment from multiple public and private sources. These mission-oriented technology industries, like nanotechnology or biotechnology, typically address questions of basic technological feasibility.<sup>6</sup> Their supply-side uncertainties create a demand for patient capital, or financing that extends beyond the typical three-to-five-year venture capital (VC) timeframe.

**Many GovTech ventures, from citizen feedback platforms to administrative software, sit, by contrast, at the applied end of the innovation lifecycle.** Despite this difference, in many countries, GovTech firms may also require patient investment due the demand-side uncertainties that they face, from slow government sales cycles to lack of opportunity for piloting. Expecting young GovTech companies to meet conventional VC timeframes for growth and profitability may place at risk both individual companies and the sustainability of the ecosystem overall. In light of these circumstances, policymakers must work both to procure more efficiently (see R3), and to ensure the availability of sufficiently patient capital for GovTech.

**A further observation is that national GovTech agendas must be underpinned by a collective vision of national deficits and aspirations, and the role of the government in addressing them.**<sup>7</sup> The capacity of policymakers to articulate a collective mission, in receipt of broad-based support, for the future of government and its relations with its citizens, will profoundly impact the developmental capacity and future strengths and weaknesses of the national GovTech ecosystem. This is because at the core of the development of GovTech lies a question about the proper role of government in society in an era of massive technological and social upheaval. The answer requires governments to re-evaluate public value in a digital age (see R2), and to ensure that they are delivering on that vision in their capacities as technology procurers, users, investors and regulators.

6 Mariana Mazzucato and Gregor Semieniuk, 'Public Financing of Innovation: New Questions', *Oxford Review of Economic Policy* 33, no. 1 (2017): 24–48, <https://doi.org/10.1093/oxrep/grw036>.

7 The utility of a sense of national mission is both hard to evidence and broadly attested. Jen Rae and Stian Westlake, 'When Small Is Beautiful: Lessons from Highly Innovative Smaller Countries', Nesta (London: Nesta, June 2014), p. 16.

**Encouragingly, we are already beginning to see GovTech being framed in terms of national needs.** In the UK, GovTech is articulated as addressing the collectively diagnosed national ‘productivity puzzle’; bolstering foreign trade opportunities; and improving health outcomes and creating a thriving ‘digital health’ industry.<sup>8</sup> All of these are key objectives in broader national Industrial Strategy (2017). In Israel, by contrast, while digital health is also a priority, GovTech is framed as a mechanism for countering the growing socio-economic gap between the 8% of Israeli citizens who have benefitted from the technology-based economy, and the rest who have not.<sup>9</sup> In each case, GovTech policies and programmes are oriented towards addressing national weaknesses, and thus realising a collectively constructed vision of a more inclusive future nation. Although the long-run successes of either GovTech policy agenda remain to be proven, these specific, unifying narratives have played a role in galvanising early-stage, high-level support in both countries.

## Developing the Ecosystem

**Beyond specific recommendations, an overarching ambition of this guide is to emphasize the type of ecosystem that GovTech is likely to be in most countries: a project of deliberate, sometimes state-led, fostering.** GovTech is premised upon the coming together of many different communities, often with

only limited pre-existing connectivity between them. In many countries, it should not be assumed that these groups and individuals will encounter each other ‘by chance’ or by virtue of market forces alone. Innovation system theorists note the critical role of ‘structured government support’ to foster the ‘sustained linkages between individuals and organizations’ that make up an innovation ecosystem.<sup>10</sup> This is likely to be the case with GovTech, where new GovTech products and services with strong market fit can only emerge from sustained connectedness between founders, policymakers, and other stakeholders. Governments cannot afford to be doctrinaire or overly interventionist, given the networked quality of innovation ecosystems, but they must create a positive institutional environment. Nurturing and catalysing specific opportunities for GovTech stakeholders to gather, trade, collaborate, critique, share ideas, build trust, and vent frustrations is crucial.<sup>11</sup>

**In some countries, many pieces of the jigsaw may already be in place—including start-ups with compelling ideas and strong teams, and enthusiastic government procurers—but suffer from disconnection.** In others, specific dimensions of the ecosystem may be missing or underdeveloped, from capital provision to an openness among government decisionmakers towards procuring technological innovation from smaller firms. The role of public policy in the ecosystem will necessarily take different

8 Department of Health & Social Care, ‘The Future of Healthcare: Our Vision for Digital, Data and Technology in Health and Care’ (London: HM Government, 17 October 2018), <https://www.gov.uk/government/publications/the-future-of-healthcare-our-vision-for-digital-data-and-technology-in-health-and-care/the-future-of-healthcare-our-vision-for-digital-data-and-technology-in-health-and-care#annex-a-case-studies>.

9 David Rosenberg, Israel’s Technology Economy (Palgrave Macmillan, 2018), 10.1007/978-3-319-76654-

10 Nataliya Smorodinskaya et al., ‘Innovation Ecosystems vs. Innovation Systems in Terms of Collaboration and Co-Creation of Value’, in Proceedings of the 50th Hawaii International Conference on System Sciences 2017 (50th Hawaii International Conference on System Sciences, Hawaii, 2017), 5245–54, p. 5247 <https://doi.org/10.24251/HICSS.2017.636>; Hermann Hauser, ‘The Current and Future Role of Technology and Innovation Centres in the UK: A Report by Dr. Hermann Hauser For Lord Mandelson, Secretary of State Department for Business Innovation & Skills’ (London, March 2010), <https://catapult.org.uk/wp-content/uploads/2016/04/Hauser-Report-of-Technology-and-Innovation-Centres-in-the-UK-2010.pdf>, p. 22.

11 Tanya Filer, ‘GovTech Requires Many Relationships of Trust’, in Cambridge Perspectives on Trust and Technology, Trust & Technology Initiative (Cambridge, UK, 2018), <https://www.trusttech.cam.ac.uk/research-themes/short-pieces/GovTech-requires-many-relationships-of-trust>.

forms, depending on these local market gaps, opportunities and advantages.<sup>12</sup> Whatever the specific circumstances, thriving and accountable GovTech ecosystems will be the product of deliberate and sustained cooperation and nurturing, ideally drawing upon, and fostering, a sense of long-term, collective national ambition. One approach to building this sense of shared responsibility may be the provision of Collaborative Public Space (CPS) or space where a diverse range of GovTech ecosystem stakeholders, who may otherwise be unfamiliar with one another, regularly interact (see R5).

**The sustainability of the ecosystem also requires attention.** Quick, clear wins at the inception of a new project can help to generate buy-in among policymakers and citizens. But strategies focused on the long term will ensure that innovation percolates into government as an enduring feature; will safeguard continuity in the provision of services delivered by GovTech firms, including to the most vulnerable populations; and will ensure the responsible use of taxpayer money, whether the public sector is a client of GovTech firms or their investor. The sustainability of GovTech ecosystems depends on several factors, including broad-based political will, an insurgent culture of change across the civil service, the provision of patient capital, and the creation of technological talent pipelines interested in tackling public problems.

## GovTech is Always Local

**The international audience for which this guide is intended should not be confused with technouniversalism, or the belief that the same technological devices can simply be replicated or exported to 'solve' like problems across the world.** It should also not be mistaken for a claim to the generalisability of public policies pertaining to GovTech across disparate national contexts. Governments frequently share comparable challenges across core public policy domains tackled by GovTech firms, including education, health, and public housing, and there is a welcome tendency towards lesson sharing among the global GovTech community, but careful consideration of local context is key.<sup>13</sup>

**The impact of implementing a specific GovTech policy or programme will vary depending on a myriad of factors at the local level.** These factors include political context, user needs, population size and diversity, stability of the policy context, and capacity for implementation. The failure of the One Laptop Per Child programme in rural Peru, and the differential effects of the market entry of Uber, the mobility company, across the globe demonstrate how distinct the social consequences of like technological rollout can be between contexts.<sup>14</sup> Practitioners should therefore engage with the ideas and examples put forward in this report as a launchpad for developing issue-specific and contextually pertinent processes, policies, and programmes.

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12 Charles W. Wessner, 'Entrepreneurship and the Innovation Ecosystem Policy Lessons from the United States; Local Heroes in the Global Village, *International Studies in Entrepreneurship*, 7 (2005): 67–89, [https://doi.org/10.1007/0-387-23475-6\\_5](https://doi.org/10.1007/0-387-23475-6_5).

13 This sharing is facilitated by global platforms (for example, apolitical) and international events (for example, the European GovTech Summit). [www.apolitical.com](http://www.apolitical.com); <https://GovTechsummit.eu/>.

14 Anita Say Chan, *Networking Peripheries: Technological Futures and the Myth of Digital Universalism* (MIT Press, 2014), pp. 173–196; Adi Robertson, 'OLPC's \$100 Laptop Was Going to Change the World – Then It All Went Wrong', *The Verge*, 16 April 2018, <https://www.theverge.com/2018/4/16/17233946/olpcs-100-laptop-education-where-is-it-now>; Tanya Filer, 'Single Storyism in Politics and Technology', *Medium* (blog), 27 February 2018, <https://medium.com/@tanyafilier/single-storyism-in-politics-and-technology-a98c36cc6409>.

**Considering these contextual factors, this guide suggests that governments place strong emphasis on building local capacity to implement projects designed to meet their desired visions of GovTech, rather than adopting so-called ‘best practice’ solutions.** As Michael Woolcock, Lead Social Scientist at the World Bank, writes, ‘the effectiveness of a given state’s policy turns on the extent to which the soundness of the policy’s content and the depth of political support it enjoys is matched to a robust implementation apparatus.’<sup>15</sup> Keeping the focus on *local* alacrity and capacity for implementation is particularly important in GovTech due to the youthfulness of the industry and thus the difficulty of genuinely identifying ‘best practices’ in any single national context, let alone practices that may usefully be transferred.

**Many (but not all) examples featured here are drawn from developed economies, reflecting the relative maturity of GovTech in those countries compared to many developing economies.** But GovTech is gaining pace globally. It has marked potential in developing economies, which may benefit from an approach fuelled by start-ups rather than expensive large IT suppliers. GovTech can, furthermore, be articulated as a compelling response to the Sustainable Development Goals (SDGs) adopted by all United Nations Member States in 2015 as part of the 2030 Agenda for Sustainable development (see R4).<sup>16</sup>

## This Guide

**This guide focuses predominantly on GovTech at the national level, though draws occasionally on city-level examples.** The focus addresses an intellectual gap: most policy literature on government collaboration with smaller companies addresses ‘smart cities’ policy rather than national technology initiatives.

**The principal data gathering tools on which this guide is based are desk research, fieldwork, and qualitative interviews with more than sixty policymakers, GovTech entrepreneurs, incubators and accelerators, and investors (private and public) based in Europe, the Middle East, Latin American, and Australasia.** Further information on Sources and Methodology appears in Appendix 1.

**Principally designed for policymakers, this guide will nonetheless be highly relevant to the broader GovTech community, from investors to entrepreneurs and researchers.** As the role of the state in developing the GovTech ecosystem necessarily differs from one country to another, some of the topics covered will be more directly applicable to non-governmental stakeholders in some countries.

**The guide forms part of the broader GovTech agenda at the Bennett Institute for Public Policy.** Further work as the industry matures will provide more in-depth analysis of specific GovTech policy levers and programme design. Future research questions can be found in Appendix 3.

15 Michael Woolcock, ‘Enhancing Public Health Outcomes in Developing Countries: From Good Policies and Best Practices to Better Implementation’; Faculty Research Working Paper Series (Cambridge, MA: Harvard Kennedy School, June 2018), p. 2.

16 <https://sustainabledevelopment.un.org/?menu=1300>.

# What is GovTech, and Why does it Matter?

## Background

**Many national governments are experienced developers and supporters of new technology-based sectors.** They have strategically invested capital, written policy, and provided resources to foster technology ecosystems corresponding to national needs and relative advantages. The Israeli high technology sector, agricultural technology in Brazil (under the Embrapa label) and financial technologies (FinTech) in the UK, are all examples. In each case, the stewardship of the state in creating and shaping a supportive environment is acknowledged as contributing significantly to the economic and broader success of the sector.<sup>17</sup>

**Despite this entrepreneurial impetus, governments are often far less experienced at playing another role in relation to innovative technologies and the firms that create them: that of their user and client.** They have tended to rely on large-scale information technology contracts with big technology firms to meet public sector technology needs. The arrangement has brought some benefits. Large technology providers, sometimes operating as 'systems integrators', typically have the human, financial and technological resources to deliver at scale. They have often

been a stable presence through changes in the political cycle, offering long-run expertise on technology usage in the public sector. In civil services where policy professionals regularly rotate office, they have also become significant carriers of corporate memory at the departmental or agency level.

**Yet the picture is not all rosy.** A small slate of large technology providers holds a monopolistic or quasi-monopolistic position in many countries.<sup>18</sup> From India to the UK, examples of big, failed government IT projects designed and implemented by large technology providers abound. HealthCare.gov, the 'Obamacare website', for which CGI Group, a technology consultancy, reportedly received \$292 million, is an infamous example.<sup>19</sup> Millions of Americans were expected to enrol within weeks of its launch but, beset by bugs and with low capacity to handle traffic, only 26,794 people had signed up a month after the website went live.<sup>20</sup> In Canada, problems with the £500 million IBM-delivered Phoenix payroll system left some government staffers unpaid for months. Others were overpaid. Critics attribute the fiasco in part to disregard by the provider for functionality and security concerns.<sup>21</sup>

17 Bengt-Åke Lundvall et al., 'National Systems of Production, Innovation and Competence Building', *Research Policy* 31, no. 2 (February 2002): 213–31, [https://doi.org/10.1016/S0048-7333\(01\)00137-8](https://doi.org/10.1016/S0048-7333(01)00137-8).

18 In the UK, the top 10 suppliers won 42% of government spend on IT Services and Systems (which does not include all digital and cyber security products and services) in 2018. Bytes Software Services, the lead recipient, was awarded £333 million—over double that of the second most awarded supplier, Neueda Limited. 'IT League Table 2018' (London: Tussell, 2019), [https://www.tussell.com/uploads/media/5c46f81b57a12/tussell-analysis-it-league-tables-2018.pdf?utm\\_source=website&utm\\_medium=insights-article](https://www.tussell.com/uploads/media/5c46f81b57a12/tussell-analysis-it-league-tables-2018.pdf?utm_source=website&utm_medium=insights-article), p. 2.

19 Sharon Begley, 'Insight - As Obamacare Tech Woes Mounted, Contractor Payments Soared', *Reuters*, 17 October 2013, <https://uk.reuters.com/article/uk-usa-healthcare-technology-insight/insight-as-obamacare-tech-woes-mounted-contractor-payments-soared-idUKBRE99G06120131017>.

20 Steven Brill, *America's Bitter Pill: Money, Politics, Backroom Deals, and the Fight to Fix Our Broken Healthcare System* (New York: Random House, 2015), p. 374.

21 'Report 1—Building and Implementing the Phoenix Pay System', 2018 Spring Reports of the Auditor General of Canada to the Parliament of Canada (Office of the Auditor General of Canada, 2018), [http://www.oag-bvg.gc.ca/internet/English/parl\\_oag\\_201805\\_01\\_e\\_43033.html](http://www.oag-bvg.gc.ca/internet/English/parl_oag_201805_01_e_43033.html).

**Large technology providers have also reportedly negotiated multi-year public sector contracts that increased in price year-on-year, even as the cost of technologies fell.**<sup>22</sup>

Poor levels of technological understanding among public sector procurers have assisted this contractual bloating. Lock-in to long contracts has also prevented public sectors from procuring the latest technologies. In this environment, public servants have had little incentive to horizon scan—actively seeking new technological apparatus with which to address stubborn public policy dilemmas—or to imagine new, more efficient and accountable ways of administering through technological uptake.

**A reform movement emerged in the early 2000s, focused on digitising government from within.** It has had notable impact on efficiency, accountability and cost effectiveness in governments around the world. The UK Government Digital Service (GDS), a pioneer in digital government, saved the UK government £4.1 billion between 2011 and 2015.<sup>23</sup> In Argentina, a lesser known example, the digital government team recently closed down at least 500 disparate government websites, streamlining citizens' interactions with government.<sup>24</sup> Positive outcomes of digital government work abound globally. Yet many digital government teams have also struggled to recruit and retain technological talent, sow cultural change across the public sector, and secure ongoing high-level support.

## The current state of play

**At the cusp of the 2020s, there is increasing global recognition in public administrations that the current modus operandi may be detrimental both to administrators and citizens.** Citizens find excessive government bureaucracy a major hurdle to improving their personal and professional lives. Many believe digital transformation could lead to improvements.<sup>25</sup> There is also internal public sector pressure: the youngest public servants (and future recruits) are now 'digital natives', with little interest in working for analogue organisations.

**To help to tackle these disconnects, policymakers are seeking to foster GovTech ecosystems in which nimble smaller companies serve as engines of innovation for the public sector.** The development provides welcome acknowledgement that better serving citizens today requires skills beyond those of traditional government 'insiders' or incumbent technology giants alone.

**Several further objectives motivate national governments to pursue GovTech agendas.** These ambitions are diverse, reflecting local context. On a global scale, however, the most common objectives that policymakers cite for developing GovTech policies and programmes include the following:

22 Tanya Filer, Russell Davies, Tech States, <https://play.acast.com/s/techstates/tech-states-russell-davies>.

23 Martha Lane Fox, 'Digital Understanding', House of Lords Hansard (London: Lords Chamber, 7 September 2017), <https://hansard.parliament.uk/Lords/2017-09-07/debates/666FC16D-2C8D-4CC6-8E9E-7FB4086191A5/DigitalUnderstanding#contribution-70DDC61D-315B-42F8-805E-C2994EBD18B5>.

24 Tom Loosemore, 'Why We're so Impressed by Argentina's Digital Services Team', Public Digital (blog), 1 June 2018.

25 'Digital Gov' 2018: Public Services Digitization as Seen by the European Citizens' (Sopra Steria Consulting, November 2018), p. 22; 'The Global Competitiveness Report 2017–2018', Insight Report (World Economic Forum, 2018), <http://www3.weforum.org/docs/GCR2017-2018/05FullReport/TheGlobalCompetitivenessReport2017%E2%80%932018.pdf>.

## Why are Policymakers engaging GovTech?

- 1 Facilitating more creative, responsive, and efficient government
- 2 Better serving citizens
- 3 Engaging broader array of skilled teams to address complex policy challenges
- 4 Addressing shortage of in-house technological capacity
- 5 Accessing cutting-edge technologies often first used by private sector
- 6 Enabling competition, avoiding technological lock-in
- 7 Stimulating economic growth through creation of new industry
- 8 Boosting transparency and accountability
- 9 Improving legitimacy
- 10 Easing workload of frontline civil servants
- 11 Recruiting / retaining a younger employee demographic
- 12 Benefitting from first mover advantages

Policymakers also occasionally cite job creation, to which start-ups contribute 'disproportionately' across numerous developed and developing economies.<sup>26</sup> There is, nonetheless, little thinking to date about the possible labour (and other) consequences of the failure of GovTech start-ups (on start-up failure rates, see Box 1, p.18).

**The objectives overall show marked enthusiasm for making government more accountable and relevant to the lives of the citizens and easing the workload of frontline civil servants.** They demonstrate a sense that new technologies (or their new application in government) may help to deliver these improvements, but also recognition that most governments do not have the capacity to develop and implement the most useful

technologies alone. The challenge that many GovTech enthusiasts in public administration now face is translating their conviction into broadly supported and cross-governmental policies and practices.

## Defining GovTech

**Despite the sense of a clear need for change, GovTech remains in definitional flux.**<sup>27</sup>

Sources describe GovTech in vague terms, as technologies 'designed with government as the intended customer or user.'<sup>28</sup> Still more broadly, it is 'all the ways that Government and the public sector can be served by new commercial and social enterprises using innovative technologies.'<sup>29</sup>

<sup>26</sup> OECD, 'Young SMEs, Growth and Job Creation', Directorate for Science, Technology and Industry (Paris: OECD, 2014), <http://www.oecd.org/sti/young-SME-growth-and-job-creation.pdf>.

<sup>27</sup> For a collated list of definitions see Martin Smith, 'Technology Innovation in Government Survey' (UK Government Digital Service, 20 August 2018), <https://www.gov.uk/government/publications/technology-innovation-in-government-survey/technology-innovation-in-government-survey#appendix-GovTech-definitions-and-ecosystem>.

<sup>28</sup> Knight Foundation and Rita Allen Foundation, 'Scaling Civic Tech: Paths to a Sustainable Future' (Knight Foundation, 31 October 2017), <https://knightfoundation.org/reports/scaling-civic-tech>; Justine Desmond and Bhavin Kotecha, 'State of the UK GovTech Market: Unlocking the Potential of Startups to Solve Public Problems' (London: PUBLIC, June 2017).

<sup>29</sup> Timothy Barnes, Government Services Entrepreneurship, Cambridge Judge Business School Launchpad, 2018, <https://www.jbs.cam.ac.uk/entrepreneurship/programmes/launchpad/specialist-pathways/government-services-entrepreneurship/>.



**Definitional breadth may have some utility at this early stage, allowing the ecosystem to draw in the broadest range of potential stakeholders.** The risk, however, of an ambiguous or overly broad definition is a confusing, and ultimately deterring, lack of clarity.<sup>30</sup> If GovTech practitioners fail to articulate succinctly why the industry is necessary in their local context and what its ambitions are, they may alienate colleagues and investors, as well as citizens wary of solutionism, or the idea that technology can 'solve' all societal ills.<sup>31</sup>

**This guide thus uses a working definition (see p.4 and below) of GovTech that strikes a balance between precision and breadth.** It draws on the definition of GovTech proposed in the UK Technology Innovation in Government survey (2018) but embeds a further normative dimension:<sup>32</sup>

**GovTech is an emergent innovation ecosystem in which private-sector start-ups and innovative small and medium enterprises (SMEs) deliver technological products and services, often using new and emerging technologies, to public sector clients. Many GovTech companies work on challenges presented by emergent policy areas, or on problems where no solution was previously imagined as technically possible. The priorities of the GovTech ecosystem include improved efficiency and greater accountability in the public sector and its interactions with citizens. Building trust across the diverse stakeholders in the ecosystem is crucial for developing**

**a thriving GovTech industry to serve the domestic public sector and to contribute to national economic growth.**

**This definition recognises efficiency as a necessary but insufficient social gain of GovTech.** It indicates that if the ecosystem can settle on an identity as focused on efficiency *and* accountability, it may become a sustainable channel for remaking citizens' satisfaction in government and for economic gains. As is increasingly recognised, there is no reason to assume that the ecosystem will develop this way organically.<sup>33</sup> Early definition can help to shape the initial activity of technology sectors, which can become highly path dependent (as the struggle of social media companies to comply with the European General Data Protection Regulation demonstrates).<sup>34</sup> As such, a definition that places accountability as foundational to the ecosystem is key.

**It stands to note that, despite the definition proposed above, GovTech cannot mean precisely the same thing everywhere.** This definition indicates those qualities acknowledged sufficiently widely to carry local resonance in many (but not all) contexts. To achieve broad-based local support, policymakers must further define GovTech in response to locally perceived and collectively determined national needs and ambitions.

30 On the need for clarity of sectorial definition when seeking investment, see Knight Foundation and Rita Allen Foundation, 'Scaling Civic Tech: Paths to a Sustainable Future' (Knight Foundation, 31 October 2017), <https://knightfoundation.org/reports/scaling-civic-tech>.

31 Evgeny Morozov, *To Save Everything, Click Here: Technology, Solutionism, and the Urge to Fix Problems That Don't Exist*, hardcover edition (Allen Lane, 2013).

32 Martin Smith, 'Technology Innovation in Government Survey' (UK Government Digital Service, 20 August 2018), <https://www.gov.uk/government/publications/technology-innovation-in-government-survey/technology-innovation-in-government-survey#appendix-GovTech-definitions-and-ecosystem>.

33 Tom Loosemore, 'Which "GovTech" Do You Mean?', Public Digital (blog), 6 December 2018.

34 Rowland Manthorpe, 'Congress Won't Hurt Facebook and Zuck, but GDPR and Europe Could', *Wired*, 10 April 2018, <https://www.wired.co.uk/article/facebook-mark-zuckerberg-congress-testimony-cambridge-analytica-gdpr-privacy>.

## Where are GovTech Ideas Generated?

### BOX 1

#### Beyond Start-up Hype

GovTech is defined by the kinds of companies that it seeks to nurture: high-quality, innovative start-ups and scale-ups (enterprises that are growing quickly and contribute to job creation).<sup>35</sup> Despite excitement about the possibility of start-ups to drive government innovation, it is worth acknowledging how many of them—at least 75% by some estimations—fail (we do not yet have information on the success rate of GovTech start-ups specifically). This precarity should be a consideration when spending public money, particularly when serving vulnerable communities, where continuity of service is key. Here, standards may be crucial to ensuring the smooth transfer of services if things go wrong. It also points towards a clear need to focus on supporting start-ups more holistically than financing or very early-stage advice alone. In one survey, 42% of polled US-based entrepreneurs cited 'lack of a market need' for their product as the primary reason that their company failed.<sup>36</sup> Communication at the earliest stage of product development is therefore key - all the more so in GovTech, where smaller companies and policymakers are often poorly connected. One founder describes 'almost no systematic association' between them. The rate of start-up failure has been found to be slightly lower for entrepreneurs who have 'significant experience' in the industry in which their business operates. This evidence validates the idea of backing GovTech entrepreneurs with experience working in, or with, public sectors.<sup>37</sup> Several GovTech companies, including Sidewalk Labs (US) and Swiftly (US), provide early indications that this broader trend may carry through into GovTech.

**As policymakers begin to seek out innovative technological ideas for the public sector, they must consider which organisations are best equipped both to facilitate idea generation and to turn those ideas into working prototypes and market-ready products and services.** A range of 'idea generator' organisations are already engaged in GovTech. Policymakers must assess which best fit the particular needs of their department, agency or civil service, and then identify mechanisms to support and work with them.

**Ideas for GovTech companies and solutions trace their origins to many different sources, including government challenge programmes, firms, public-private sector join competitions, and incubators and accelerators (state and private).** In the future, this range is likely to broaden to include other organisational types, including universities (in contrast to more advanced technology sectors, only a few universities contribute directly to the GovTech ecosystem, even in the more advanced US GovTech market). Diversification should be encouraged to ensure that a broad range of entrepreneurs have the opportunity to bring their ideas to market, and to improve the quality of government suppliers through increasing competition. GovTech programmes based outside capital cities and in low-income communities may be particularly useful in stimulating place-based solutions that respond to local needs and contributing to economic growth outside metropolitan centres.

35 Sherry Coutu, 'The Scale-Up Report on UK Economic Growth' (London: Information Economy Council, n.d.), [http://www.scaleupinstitute.org.uk/wp-content/uploads/2018/02/scaleup-report\\_2014.pdf](http://www.scaleupinstitute.org.uk/wp-content/uploads/2018/02/scaleup-report_2014.pdf), p. 18.

36 '287 Startup Failure Post-Mortems' (CBInsights, 14 November 2018), <https://www.cbinsights.com/research/startup-failure-post-mortem/>.

37 André Spicer, "'Fail Early, Fail Often' Mantra Forgets Entrepreneurs Fail to Learn', The Conversation, 9 December 2015, <https://theconversation.com/fail-early-fail-often-mantra-forgets-entrepreneurs-fail-to-learn-51998>.

**TABLE 1. Where are GovTech Ideas Generated?**

Organisation Type	Idea Generators	Examples
<b>Government Challenge Programmes</b>	<ul style="list-style-type: none"> <li>o Challenge areas typically selected by central GovTech team, with Government departments proposing challenges that they require assistance in tackling</li> <li>o Entrepreneurs come up with ideas to tackle selected challenges, awarded grant or small investment to develop it</li> </ul>	<ul style="list-style-type: none"> <li>o UK GovTech Catalyst Scheme (challenge examples: rural isolation, tracking Daesh still imagery online)<sup>1</sup></li> <li>o Israel Digital Innovation Fund for Public Sector Challenges (challenge examples: linking and maintaining dispersed social welfare databases, digital applications for improving the efficiency of local government)<sup>2</sup></li> </ul>
<b>Government Competitions</b>	<ul style="list-style-type: none"> <li>o Entrepreneurs</li> <li>o Government may define broad policy focus</li> </ul>	<ul style="list-style-type: none"> <li>o GovTech (Portugal) competition for start-ups with prototype to tackle any United Nations Sustainable Development Goal. Winners selected by jury and public using blockchain voting system; prize includes cash and opportunity to collaborate with Portuguese government; focus on assisting with internationalisation<sup>3</sup></li> </ul>
<b>Firms</b>	<ul style="list-style-type: none"> <li>o Entrepreneurs</li> </ul>	<ul style="list-style-type: none"> <li>o Biobot Analytics (US) – data insights from sewage</li> <li>o ZenCity (Israel) – citizen sentiment analysis</li> <li>o Socrata (US) – open data and data-driven decision-making</li> </ul>
<b>Public-private sector joint competitions</b>	<ul style="list-style-type: none"> <li>o Public office and private company agree terms of the competition, including challenge areas</li> <li>o Teams generate ideas, may result in company formation</li> </ul>	<ul style="list-style-type: none"> <li>o Google, the Ministry of Justice and Ben Gurion University joint competition (Israel)</li> </ul>
<b>Incubators and Accelerators (state, private or blended finance)</b>	<ul style="list-style-type: none"> <li>o Entrepreneurs</li> <li>o Incubators may assist entrepreneurs with idea generation through organising relevant one-to-one meetings and programming</li> </ul>	<ul style="list-style-type: none"> <li>o GovStart (UK and France)<sup>4</sup></li> <li>o Lightning Lab GovTech (New Zealand)<sup>5</sup></li> </ul>
<b>Government Hackathons</b>	<ul style="list-style-type: none"> <li>o Groups and individual attendees</li> <li>o Attendees may be asked to focus on specific challenges or policy areas</li> <li>o Governments may provide datasets for attendees to work on</li> </ul>	<ul style="list-style-type: none"> <li>o Code4PA (Pennsylvania, USA) focused in 2018 on addressing the opioid epidemic<sup>6</sup></li> <li>o DiploHack Brussels focused in 2018 on creating new transparency applications using European data<sup>7</sup></li> <li>o Blockchain Talent Hackathon 2017 focused on public sector applications of blockchain (Mexico)<sup>8</sup></li> </ul>
<b>Multi-lateral and third-sector initiatives</b>	<ul style="list-style-type: none"> <li>o Entrepreneurs responding to funds and competitions from multi-laterals (eg. regional development banks) and third-sector organisations</li> <li>o Often focused on global challenges, where national governments may be client</li> </ul>	<ul style="list-style-type: none"> <li>o UNICEF Innovation Fund invests in international early-stage emerging technology ventures. In 2018 launched Blockchain call focused on global problems such as transparency in healthcare delivery<sup>9</sup></li> </ul>
<b>Bug Bounty Programmes</b>	<ul style="list-style-type: none"> <li>o Hackers, focused on identifying public sector cyber security vulnerabilities – though not an explicit programme objective, access to government systems and websites may lead to ideas for GovTech products and services</li> </ul>	<ul style="list-style-type: none"> <li>o GovTech Singapore Bug Bounty Program (Singapore) in partnership with HackerOne</li> </ul>

1 <https://www.gov.uk/government/collections/govtech-catalyst-information/>.

2 <https://innovationisrael.org.il/en/program/digital-innovation-public-sector-challenges/>.

3 <https://govtech.gov.pt/#govtech/>.

4 <http://www.public.io/govstartfr/>; [www.public.io/govstartuk/](http://www.public.io/govstartuk/).

5 <https://llgovtech.co.nz/>.

6 <http://www.code4pa.tech/>.

7 <http://diplohack.brussels/>.

8 [www.gob.mx/cms/uploads/attachment/file/269552/Folleto\\_blockchain\\_HACKMX\\_oct2017\\_v6.pdf](http://www.gob.mx/cms/uploads/attachment/file/269552/Folleto_blockchain_HACKMX_oct2017_v6.pdf).

9 [www.unicef.org/innovation/stories/VCfundBlockchainCohort](http://www.unicef.org/innovation/stories/VCfundBlockchainCohort).

# Barriers to GovTech Adoption and Implementation

## Barriers to GovTech adoption

**Despite the many possible advantages of engaging GovTech, there are several barriers to adoption.** These barriers are surmountable but must be addressed as a priority if national governments are fully to harness the potential benefits of new and emerging technologies. How policymakers negotiate them will impact the reception of GovTech both within and beyond the public sector. It will thus affect the sustainability of GovTech as a national project.

### What are the principal barriers to GovTech adoption in the public sector?<sup>38</sup>

- Lack of technological understanding in the public sector
- Difficulty recruiting and retaining technological talent, including as knowledgeable and demanding clients of technology suppliers
- Lack of interest or understanding regarding working with start-ups<sup>39</sup>
- Perception of digital innovation as extra, non-essential and peripheral work<sup>40</sup>
- Procurement systems no longer fit for purpose
- Slow purchasing decision-making processes
- Long-held incumbent relationships and contracts with technology giants and over-dependence on their services and advice
- Over-reliance on individual digitisation 'champions' in public sector
- Organisational structures and cultures that disincentivise experimentation and

stoke fear of disempowerment

- Politics, including lack of political will
- Fear of public perception of failed experimentation
- Responsibility to balance experimentation with providing stability, especially when serving vulnerable citizens<sup>41</sup>

## Challenges of GovTech Implementation

**Beyond these barriers to adoption, governments that decide to pursue a GovTech agenda may confront several challenges of implementation. They include:**

- Inexperience of start-ups in working with government and vice-versa
- Divergent cultural factors and modi operandi (real and perceived) between start-ups and government
- Incompatibility of investor expectations and government sales' cycles
- Difficulty of ensuring accountability when technological solutions are outsourced to private sector companies
- Scalability and generalisability of start-up product and services
- Risk of fragmentation and duplication when working with smaller technology providers

The recommendations that follow explore mechanisms for overcoming each of the challenges of adoption of implementation listed above (see Appendix 2 for the most relevant recommendations to address each one).

38 As perceived by policymakers and GovTech entrepreneurs.

39 In 2017 only 21% of civil servants surveyed (comprising senior civil servants, civil servants in key technology roles and civil service overall) supported the idea of more procurement from SMEs. Dods Public Sector, 'Technology in Government 2017: A Survey of the Civil Service for TechUK March 2017' (TechUK, March 2017).

40 On the challenge this perception can pose to innovation units, see Andrew Greenway et al., *Digital Transformation at Scale: Why the Strategy Is Delivery* (London: London Publishing Partnership, 2018), pp. 79–90.

41 Acknowledging that many public services provide a degree of stability in their service provision indicates only that citizens can expect a minimum level of service provision without disruption. It does not mean that they function perfectly and should continue in their present form without the benefits of digitisation.

# Part 2.

## Recommendations

# 1. Build the Social and Technical Foundations for GovTech

To reap the possible benefits of GovTech for society, policymakers must address as a priority four core areas: 1. developing core digital infrastructure; 2. building robust cybersecurity systems and talent pipelines; 3. ensuring universal Internet access; and 4. ensuring universalism in access to online public services, including through accessibility and digital skills for all. Few developing or developed countries can claim to have fully addressed every area. Their prioritisation will help to provide the conditions to enable a highly functional GovTech ecosystem with strong public support.

## Recommendations

### 1) Infrastructure

**The future of GovTech depends upon governments developing core digital infrastructure upon which start-ups and other providers can easily build.**<sup>42</sup> Digital infrastructure is 'the purpose-built large-scale networked information and communication technologies that have a scope and reach beyond a single site or practice. They are embedded into organizations, contain standards, and become visible upon breakdown.'<sup>43</sup> In the public sector context, this infrastructure is often described as Government as a Platform (GaaP).

**The form of GaaP that is perceived as desirable differs between (and within) political and cultural contexts, largely because of discrepancies regarding how and which data should be moved across it.** A few countries, most famously Estonia, have a unified public digital infrastructure through which services regularly communicate with each other and

exchange data. Despite the efficiency of this approach for data retrieval and usage, as a model it would raise significant privacy concerns in other countries. But multiple interoperable systems, with secure and comprehensive data sharing enabled between them (often through Application Programme Interfaces, or APIs), is conceivable in countries with strong privacy requirements. Shared data standards are key to enabling such interoperability: without them, public sector work will remain siloed across systems.

**In many countries, developing GaaP will require a transition from long-standing legacy systems.** The scale of the project requires the backing of senior champions, a strong mandate and, to ensure widespread and willing uptake, cultural transformation across the public sector.

### 2) Cybersecurity

**Governments must ensure that they have robust cybersecurity measures in place to protect critical national infrastructure and avoid data breaches and leaks.** The challenge may be heightened when working with numerous, small providers who lack experience in securing their products and services. It is thus crucial both to build cybersecurity measures into the underlying GaaP architecture, *and* to prioritise cybersecurity in GovTech industry standards (see R2). Governments cannot fully outsource responsibility for cybersecurity to contracted suppliers and must at least have the capacity to be knowledgeable clients that evaluate cybersecurity measures as a key consideration in every GovTech procurement process. It is therefore incumbent on policymakers to tackle the cybersecurity skills

42 Mark Thompson, Jerry Fishenden, and Will Venters, 'Better Public Services: A Manifesto' (London, 2018); 'GovTech: Europe's next Opportunity' (Accenture & PUBLIC, 2018).

43 Matt Willis, 'National Digital Infrastructures for Healthcare: A Comparative Case of Estonian and British Healthcare Infrastructure', Working Paper Series (Centre for Technology and Global Affairs, University of Oxford, May 2018), <https://www.ctga.ox.ac.uk/article/wp8>

gap in the public sector, through training and where necessary through incentive schemes to gain access to the (already limited) global pool of cybersecurity talent.

### 3) Universal Internet Access

**Less than 50% of the global population is currently online.**<sup>44</sup> The problem is particularly acute in developing economies, but by no means exclusive to them.<sup>45</sup> For the benefits of GovTech to be inclusively felt, every citizen must have Internet access and the skills to use it. Key GovTech subsectors, including service provision and participation, risk otherwise deepening current social inequalities. State-provided Internet access is particularly critical where the cost to the private consumer prohibits access. In 2013, Mexico became the first country to introduce a constitutional right to government-provided Internet.<sup>46</sup> National governments seeking to digitise their interactions with citizens must make a similar commitment. Yet the promise of Internet access is not enough alone. It must be accompanied by a clear, quick, and feasible plan for implementation.<sup>47</sup> Lack of online access presents a genuine risk of disenfranchisement when governments shift to the kind of Internet-based service delivery intrinsic to GovTech. Variation in quality of access can also have meaningful impact on citizen-state relations.<sup>48</sup> Although governments emphasize the efficiency and possible productivity gains

of digitisation, travelling to use high-speed Internet to access public services, as remains the case for many citizens, may not be more time efficient than spending time travelling to a government office.

Duplicating resources by maintaining a parallel analogue system to serve the unconnected or poorly connected may lack cost-effectiveness. but some duplication is necessary, at least until 1) universal, high quality Internet access is guaranteed to all and 2) all citizens accept the wholesale digitisation of their interaction with the public sector, including for service provision.

### 4) Accessibility and Digital Skills for All

**Sector standards must include accessibility requirements, helping to ensure that users are not excluded from public services on the basis of disability.** While digital government teams often work to internal accessibility requirements, third-party providers are not always held to the same standards.

Governments must also ensure that lack of digital understanding is not a barrier to online interaction with the public sector. Methods for addressing the skills gap include the provision of access to digital skills training for populations who would otherwise struggle to use Internet-based services.<sup>49</sup>

44 'UN Broadband Commission Sets Global Broadband Targets to Bring Online the World's 3.8 Billion Not Connected to the Internet', International Telecommunications Union, 23 January 2018, <https://www.itu.int/en/mediacentre/Pages/2018-PR01.aspx>. The UN measurement considers a person to be online if they have used the Internet at least once in the past three months, which sets the bar considerably lower than would be needed for consistent online public service provision. It also does not account for differences in quality of Internet access, such as slow connectivity.

45 <http://www.internetlivestats.com/internet-users-by-country/>.

46 Jack J. Barry, 'Mexicans Have World-First Constitutional Right to Government-Provided Internet Opinion: Getting Everyone Online Could Reduce Poverty and Boost Economy', Apolitical (blog), 28 November 2018, [https://apolitical.co/solution\\_article/internet-poverty-connection-mexico/](https://apolitical.co/solution_article/internet-poverty-connection-mexico/); <https://mexicoconectado.gob.mx/>.

47 In the Mexican case, three years after the constitutional amendment committing to universal online access, only 47% of households reported having Internet access (though many more public spaces are now online)

48 Jack J. Barry, *Information Communication Technologies and Poverty Alleviation: Promoting Good Governance in the Developing World*, Routledge Explorations in Development Studies (New York: Routledge, 2019).

49 The OECD recommends that governments increase 'all age groups' comfort and familiarity with using IT to interact with the Public Sector: 'OECD Digital Government Toolkit' (Paris: OECD, 2018), <http://www.oecd.org/governance/digital-government/toolkit/principle1/>

## 2. Embed Expectations of Accountability at an Ecosystem-wide Level

**A crisis of trust in governance institutions has long been brewing across democracies.** We may also be at the dawn of a technology backlash, with growing (and sometimes justified) apprehension surrounding the technologies that affect our lives and the people and organisations who invent them.<sup>50</sup> GovTech emerges at the convergence point of this double dip in public confidence.

**As GovTech companies rise to prominence, they could help to rehabilitate citizens' trust in the integrity of institutions, for example by reducing fraud in public sector contracting.** Numerous GovTech companies, including Pondera (US) and Datawheel (US), help to tackle fraud reduction.<sup>51</sup> Such developments are promising. But a lack of sectorial accountability—responsibility, answerability and respect for societal values—could have the opposite effect, aggravating the crisis.

**In contrast to government, the primary obligation of private sector enterprises, including GovTech firms, is to maximise private value for their owners or shareholders.**<sup>52</sup> When ensuring public value appears incompatible with that corporate obligation, there is a risk of its going by the wayside. Pressure has already begun to mount on technology giants to act more accountably in their public sector partnerships, and on government to enforce accountability,

particularly around the use of data generated by citizens.<sup>53</sup> Yet the focus on technology titans risks occluding deliberation on the standards to which start-ups with high-growth potential that work with the public sector are held. This absence is understandable—the societal stakes are (currently) lower, and policymakers fear stifling useful innovation—but short-termist, all the more so in countries that seek to increase their spend to start-ups and SMEs.<sup>54</sup> Inattentiveness today risks spawning a new generation of powerful technology companies, handling public sector data from day one, that acts with scant accountability.

**Policymakers must establish accountability as a prerequisite for working with government, and must ensure their capacity to enforce it.** Currently, there remain many blurred lines, particularly where data-driven technologies are involved. To what ends, for example, is it permissible for data passed to a private supplier by a public sector client be used beyond the initial designated task? Will governments oversee the code—the instructions given to hardware—inside the technologies that they procure? Do they have the mandate *and* skills to do so?

50 James Wise, 'Big Tech Overtakes Banking as the Sector We Love to Hate', The Telegraph, 8 January 2019, <https://www.telegraph.co.uk/business/2019/01/08/big-tech-overtakes-banking-sector-love-hate/>; Rachel Botsman, 'Dawn of the Techlash', The Guardian, 11 February 2018, <https://www.theguardian.com/commentisfree/2018/feb/11/dawn-of-the-techlash>

51 Datawheel helped to provide data visualisation for Mapainversiones (a digital platform commissioned by IDB) to enable users to track the physical and financial progress of public investment projects in the region. <http://mapainversionescr.mideplan.go.cr/ComoFunciona/Sitio>.

52 Tanya Filer, 'Governing GovTech', Bennett Institute for Public Policy, University of Cambridge (blog), 2018, <https://www.bennettinstitute.cam.ac.uk/blog/?page=3>

53 Julia Powles and Hal Hodson, 'Google DeepMind and Healthcare in an Age of Algorithms', Health and Technology 7, no. 4 (December 2017): 351–67, <https://doi.org/10.1007/s12553-017-0179-1>

54 Crown Commercial Service, 'The SME Spend Target Must Go On', 29 January 2018, <https://www.gov.uk/government/news/the-sme-spend-target-must-go-on>



## Recommendations

### 1) Develop a cohesive approach to data across the public sector

**Regulation such as the European GDPR can help to determine how citizens' data is used by GovTech firms.** Yet without a cross-organisational approach to data and its use by third-party providers, consistency can remain patchy. In the UK, NHS hospital trusts have treated patient data—a core asset—in markedly different ways. A London hospital trust transferred medical data for free to third-party servers in 2015, in an arrangement later deemed illegal.<sup>55</sup> By contrast, in 2017 an Oxford hospital trust signed a data-for-equity deal with a digital health technologies company, with the ambition of returning some eventual company profits to the trust.<sup>56</sup> Failure to articulate and act upon a common understanding of the value of citizens' data, and thus how it should be used, could trigger profound accountability issues and exacerbate existing social inequalities. Policymakers must seek to supply clarity over how data generated by citizens can be used by private contractors. In many cases a mix of complementary legal mechanisms and industry standards will be needed.<sup>57</sup>

**New approaches to data management must also be explored.** Data trusts, in which a legal structure provides 'third-part stewardship of data' are currently being piloted in several countries.<sup>58</sup> Careful monitoring and evaluation of these pilots can help to ascertain their utility for enabling the development of companies

that respond to public problems while maintaining privacy and creating trust over data usage.

**Citizens must also be equipped to understand when and why data that they have generated is being used in public-private partnerships.** Open tender processes can help to ensure that *intended* usage is publicly accessible and debatable. This approach is preferable to confining public communications only to a retrospective afterthought when citizens can no longer input into how data that they generate will be used, which may stoke discontent.

### 2) Consider introducing GovTech industry standards

**The accountability of the GovTech ecosystem could benefit from technical and ethical industry standards that complement broader regulation (for example, GDPR in Europe).**<sup>59</sup> Although there is concern that standardisation, if introduced prematurely, might stifle innovation, standards could help to offset potential problems before they arise, for example by preventing lock-in and providing assurance to citizens wary of government technology outsourcing to little known providers. GovTech covers a broad church of products and services, and standards must be sufficiently capacious to accommodate this range. As a starting point, governments should seek to understand the areas in which GovTech industry standards would have the most impact and support.

55 'Royal Free - Google DeepMind Trial Failed to Comply with Data Protection Law', Information Commissioner's Office, 3 July 2017, <https://ico.org.uk/about-the-ico/news-and-events/news-and-blogs/2017/07/royal-free-google-deepmind-trial-failed-to-comply-with-data-protection-law/>

56 'Ground-Breaking Digital Health Deal Agreed with Drayson Technologies', Oxford Biomedical Research Centre, 11 July 2017, <https://oxfordbrc.nihr.ac.uk/ground-breaking-digital-health-deal-agreed-with-drayson-technologies/>

57 For example, see NHS Digital, 'NHS Digital, Data and Technology Standards Framework (Beta)' (HM Government, 2018), <https://digital.nhs.uk/about-nhs-digital/our-work/nhs-digital-data-and-technology-standards/framework>

58 'UK's First "Data Trust" Pilots to Be Led by the ODI in Partnership with Central and Local Government', Open Data Institute, 20 November 2018, <https://theodi.org/article/uks-first-data-trust-pilots-to-be-led-by-the-odi-in-partnership-with-central-and-local-government/>

59 On technical standardisation and interoperability see R1.

### 3) Understand what GovTech is not

**To ensure that GovTech is a vehicle for responsible administration, including the sound use of taxpayer money, it is important to clarify the limitations of GovTech and what can be expected of its products and services.** GovTech should not be considered:

#### a. A Substitute for Stability

**Public sectors are frequently criticised for an organisational conservatism that disincentivizes risk-taking.** This criticism is often justified. But it is also true that governments must balance the need to innovate with the responsibility to supply stability (even when delivery is imperfect), particularly when serving vulnerable populations. It may therefore be inappropriate to award large service delivery contracts to start-ups with little experience of government as client (or little experience overall). It could also lack cost-effectiveness, if companies are ultimately unable to deliver at scale. Governments should instead ensure plentiful opportunities to award smaller contracts and to pilot GovTech products in a controlled environment, such as sandbox testing. They can thus mitigate delivery-related risks and consider appropriate regulation prior to public roll-out.<sup>60</sup>

#### b. A Substitute for Basic Infrastructure

**Many GovTech firms promise to utilise new and emerging technologies, including artificial intelligence and machine learning; blockchain; the Internet of Things; Robotic Process automation; and geospatial data analysis.**

Governments are also seeking to understand how best to use these technologies in the public sector, recognising potential positive impact. They cannot, however, substitute for secure digital infrastructure (see R1), which, as a key enabler of digital innovation across the public sector, must be prioritised.<sup>61</sup>

#### c. A Substitute for Human Decision-makers on Critical Topics

**There is excitement surrounding potential use cases of artificial intelligence (AI) and machine learning (ML) to deliver improved efficiency and accuracy in the public sector.** To date, positive use cases include assisting with resource allocation and responding to simple questions from citizens.<sup>62</sup> This kind of automation may bring two principal benefits: time efficiency, enabling civil servants to focus on the less rule-bound dimensions of their work; and cost reduction.

**Caution must be exercised regarding the types of public sector work that machine learning and other algorithms—often developed by private sector providers—are engaged to perform.**<sup>63</sup> Given major cross-sectoral concerns surrounding algorithmic fairness and explainability, it remains inappropriate to outsource critical public sector decision-making to algorithms, particularly where citizens are concerned. Numerous use cases, from automating legal decisions to predictive policing and sentencing, already demonstrate the harm to citizens, to democracy, and to government reputation that can result from depending on computer algorithms (in their current phase of development)—and the people

<sup>60</sup> For example, see the UK Financial Conduct Authority regulatory sandbox. 'Regulatory Sandbox', Financial Conduct Authority, 11 May 2015, Regulatory sandbox

<sup>61</sup> On the limitations to infrastructural applications of blockchain in the public sector, see Jamie Berryhill, Théo Bourgy, and Angela Hanson, 'Blockchains Unchained: Blockchain Technology and Its Use in the Public Sector', OECD Working Papers on Public Governance (Paris: OECD, 19 June 2018), <https://doi.org/10.1787/19934351>, pp. 29–33.

<sup>62</sup> Hila Mehr, 'Artificial Intelligence for Citizen Services and Government' (Ash Center for Democratic Governance and Innovation, August 2017), [https://ash.harvard.edu/files/ash/files/artificial\\_intelligence\\_for\\_citizen\\_services.pdf](https://ash.harvard.edu/files/ash/files/artificial_intelligence_for_citizen_services.pdf), p. 8.

<sup>63</sup> 'What Role Should the Private Sector Play in Developing Artificial Intelligence for Government?', WEF Agenda (blog), 21 June 2018, <https://www.weforum.org/agenda/2018/06/developing-ai-for-government-what-role-and-limits-for-the-private-sector>

who design them—to make critical public policy decisions.<sup>64</sup>

### d. A Substitute for the State

**There must a clear line of responsibility *within* the public sector for projects contracted to GovTech firms.** Providing it is appropriately regulated and costed accessibly for smaller companies, bid security such as bank guarantees can help to ensure that start-ups deliver.<sup>65</sup> GovTech industry standards can also push companies to meet accountability requirements. But ultimate responsibility for public service delivery lies with the public sector. As Michael King, the UK Local Government Ombudsman, argues, ‘the public sector can outsource the service but it cannot outsource its responsibilities.’<sup>66</sup> There must be explicit clarity over where, within the public sector, responsibility lies for successful delivery. This attribution can be muddled where project ownership is blurred, for example when a central GovTech team procures on behalf of an agency. Comprehensive outsourcing of the delivery of critical national infrastructure, such as core data registries (for example, patient registries in healthcare) could pose significant accountability challenges, and governments must ensure sufficient in-house capacity to be active partners.

**Technology companies are also increasingly taking on functions traditionally associated with the state, particularly in contexts ‘where public institutions are immature or not present’ or are failing to deliver.**<sup>67</sup> This private-sector supply can reduce the burden of delivery on the state. But there is a risk of deepening inequalities in contexts where core functions such as reliable mobility become wholly privatised or where state provision cannot compete with the quality or convenience of private sector offerings. Where public sectors become dependent on private firms to provide—and control with little oversight—core functions the risk of regulatory capture may also be heightened.

64 On the risks of predictive policing and sentencing, see Jamie Susskind, *Future Politics: Living Together in a World Transformed by Tech* (Oxford: Oxford University Press, 2018), pp. 174–176.

On the risks of opacity and mission creep, see Jacob Mchangama and Hin-Yan Liu, ‘The Welfare State Is Committing Suicide by Artificial Intelligence’, *Foreign Policy*, 25 December 2018, <https://foreignpolicy.com/2018/12/25/the-welfare-state-is-committing-suicide-by-artificial-intelligence/>

65 The World Bank advocates imposing a maximum amount of bid security to prevent deterring suitable applications. ‘Benchmarking Public Procurement 2016: Assessing Public Procurement Systems in 77 Economies’ (Washington, DC: World Bank Group, 2016), <https://openknowledge.worldbank.org/bitstream/handle/10986/22649/9781464807268.pdf?sequence, p. 22.>

66 Public Administration and Constitutional Affairs Committee, ‘After Carillion: Public Sector Outsourcing and Contracting’ (London: UK Parliament, 9 July 2018), <https://publications.parliament.uk/pa/cm201719/cmselect/cmpubadm/748/74807.htm, 4.54.>

67 Andrew Greenway et al., *Digital Transformation at Scale: Why the Strategy Is Delivery* (London: London Publishing Partnership, 2018), p. 6.

### 3. Address GovTech Procurement Barriers

**With alarming yet clarifying regularity, entrepreneurs cite procurement-related issues as the principal source of aversion to pursuing government contracts.** This tendency is all the more concerning given that public procurement is the largest single marketplace across developing and developed economies, accounting for around one-fifth of global GDP.<sup>68</sup> In a recent survey, US-based start-ups listed lengthy government sales' cycles, the complexity of the tendering process, the sense that the process favoured pre-existing providers, and closed-mindedness towards new solutions as the main detracting features.<sup>69</sup> Entrepreneurs in other national contexts cite similar reasons, with corruption and crony capitalism also mentioned as factors that deter them from bidding for government work. For many start-ups focused on securing quick results, it does not seem worth the considerable investment of time, and sometimes money, involved.

**A further limiting factor is lack of information: entrepreneurs note that public sector procurers only infrequently approach the entrepreneurial community, expecting start-ups instead to find and navigate opaque online procurement platforms (where they exist) and analogue calls (where they do not).** And while digital procurement platforms such as the UK Digital Marketplace (and its G-Cloud framework) are now deemed essential across regions,

they may fail to reach their full potential if they are difficult to locate or navigate; are overburdened by jargon; or still require bids to be submitted offline.<sup>70</sup> Furthermore, through procurement can be a vehicle for 'social value', or broader benefits to society than a purchased product or service, the appearance of the term on bid information may alienate unfamiliar suppliers where its meaning is unclear or used inconsistently—as has historically been the case in the UK.<sup>71</sup>

**All of these factors, whether real or perceived, disincentivise start-ups from seeking to work with public sector agencies and departments, which in turn lose out on innovations that could add meaningful public value.** Where these issues are genuine barriers to entry, it is crucial that policymakers address them and then communicate their reforms to the entrepreneurial community. Where start-ups hold misperceptions, procurement teams must also prioritise communications and relationship-building, promoting transparency and building trust among business communities that currently view public sector procurement with caution or suspicion. Many of these barriers can be addressed through a shift towards 'open contracting', or the fuller public disclosure of procurement related activity at each stage of the procurement process.<sup>72</sup>

68 'Benchmarking Public Procurement 2016: Assessing Public Procurement Systems in 77 Economies' (Washington, DC: World Bank Group, 2016), <https://openknowledge.worldbank.org/bitstream/handle/10986/22649/9781464807268.pdf?sequence, p. 17>.

69 Geoff Orazem et al., 'Why Startups Don't Bid on Government Contracts' (Boston Consulting Group and Eastern Foundry, 22 August 2017), <https://www.bcg.com/en-gb/publications/2017/public-sector-agency-transformation-why-startups-dont-bid-government-contracts.aspx>.

70 Bidders could submit bids online in only 31 of 77 economies (developed and developing) measured by the World Bank in 2016. 'Benchmarking Public Procurement 2016: Assessing Public Procurement Systems in 77 Economies' (Washington, DC: World Bank Group, 2016), <https://openknowledge.worldbank.org/bitstream/handle/10986/22649/9781464807268.pdf?sequence, p. 3>.

71 Mark Thompson, 'Disrupting Government: Reassessing Social Value for the Internet Age', Bennett Institute for Public Policy, University of Cambridge (blog), 2018, <https://www.bennettinstitute.cam.ac.uk/blog/disrupting-government-reassessing-social-value-int/>.

72 Open Contracting Partnership, '2015-2018 Strategy', 2015, [https://d3n8a8pro7vhmx.cloudfront.net/opencontracting/pages/1/attachments/original/1444666090/OC\\_P\\_Strategy\\_2015.pdf?1444666090](https://d3n8a8pro7vhmx.cloudfront.net/opencontracting/pages/1/attachments/original/1444666090/OC_P_Strategy_2015.pdf?1444666090).

**The recommendations provided here do not address the large-scale procurement reforms that many people hope will transform how governments buy technology.** They include building better online procurement infrastructure, regulatory change, and the capacity to diminish budgetary silos in order to spend more efficiently.<sup>73</sup> Even where there is reforming will, these government-wide processes will often take a long time to implement. The suggestions offered here thus encourage GovTech procurers to think imaginatively about what action they can take *now* to assist the capacities of their agencies to work with innovative smaller companies. For many of these recommendations to be implementable, however, procurers need to have sufficient authority to instigate change. Yet currently, in many countries, government procurers are reportedly often junior, lacking experience and mandate for creativity.

## Recommendations

### 1) Where appropriate, tender challenges rather than pre-determined solutions

**There is broad agreement among policymakers interested in procurement reform that a key benefit of diversifying public sector contracting is access to a broader array of talent, technologies, and ideas.** But tendering a specific solution that is pre-defined internally, as public sector agencies tend to do, risks excluding from the process start-ups that have high-quality and viable products and services with strong product-market fit. Tendering challenges, by contrast, allows public sector agencies to draw on the capacity of start-ups to inject new ideas and approaches into the public sector.

**Challenge tendering is often organised via central competition, with challenges issued through one of the following approaches:**

### **I. Taking a specific, narrowly defined policy problem to the market**

Example: The UK GovTech Catalyst Fund enables UK Government teams to take pre-defined problems, not solutions, to market. It allows departments to take specific difficulties that they face and open up the problem-solving process to well-qualified candidates with ideas and skills to address them. A centralised team based in GDS selects the challenges from applications drawn from across the public sector. To date, challenges have including 'tracking Daesh still imagery online' and 'combatting rural isolation'. Brief information on each challenge is available on GOV.UK, and the GovTech team also run a number of engagement activities across the country to further disseminate relevant information.

### **II. Taking a policy area to the market**

Example: This approach is adopted by the Israel Digital Innovation Fund for Public Sector Challenges. Its competition is arranged into broad categories including 'digital education', 'digital public services' and 'digital health', which the central Fund team select from departmental submissions. These categories are subdivided into numerous, briefly defined challenges, each of which covers a broad remit. Entrepreneurs are further invited to submit *any* proposal they have, regardless of whether it fits within the ringfenced areas. The approach ensures that good ideas, no matter what their application, are not lost to the public sector. This method may be useful for addressing an overall concern about the innovative capacity of the public sector but could also pose logistical challenges relating to capacity and appropriately channelling and managing individual bids.

### 2) Work creatively within regulatory bounds

**Traditional procurement processes are rarely designed to accommodate for the particular**

73  
2018).

For example, Mark Thompson, Jerry Fishenden, and Will Venters, 'Better Public Services: A Manifesto' (London,

**qualities of smaller companies.** Companies may be required to show considerable financial assets, for example, an impossibility for many young companies. A raft of innovative start-ups may be excluded from the competition as a result of these regulatory constraints. Where governments are not undertaking broad-scale procurement reform, GovTech procurers must thus approach procurement creatively, seeking out alternative mechanisms. In the UK, for example, the GovTech Catalyst Scheme is financed through a Small Business Research Initiative (SBRI) fund, which focuses on R&D. Traditional supplier requirements are waived because of the early-stage focus.

**It remains the case in most countries, however, that when centralised GovTech competitions conclude, start-ups must typically then enter the standard departmental procurement process, even after a successful pilot.** By that point, however, they have acquired key departmental contacts—without which many start-ups indicate reluctance to bid.<sup>74</sup>

**Directly explaining procurement restraints to start-ups can also yield innovative approaches.** Eyal Feder, CEO of ZenCity, a start-up focused on citizen sentiment analysis, explains that the company concertedly works with officials to expedite contracting. Sometimes the company will go through a bidding process, sometimes it will come in under the threshold at which bidding is required, sometimes it finds alternative contract vehicles.<sup>75</sup> The UK Government directly advises SMEs to pitch below the threshold where possible, to avoid pre-qualification questionnaires (which have been discontinued for smaller bids).<sup>76</sup> Start-

ups are hungry for new clients, and repeat revenue—which governments are often well placed to offer—and will likely accommodate where possible.

### 3) Prioritise Market Engagement

**It is not enough alone to improve the procurement process for start-ups. For these reforms to have impact, it is crucial that they are also communicated directly to the GovTech community.** This work is often lacking. In 2015, for example, the UK Government introduced Mystery Shopper (a supplier complaint mechanism) and Contracts Finder (a search engine for information about contracts over £10,000 with the government and its agencies), procurement reform initiatives specifically targeted at the SME market. Despite their objective to assist smaller companies in working with government, 'a lack of awareness' among start-ups and SMEs reportedly hindered their capacity to engage high-quality new players.<sup>77</sup>

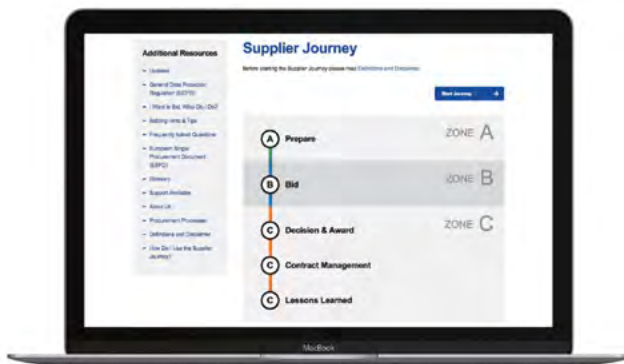
**Procurers often recognise, and are frustrated by, the disconnection between their reform effort and its communication to start-ups and SMEs.** As a senior Israeli technology procurer described, 'we know it's important work, but it's not in anybody's job description and nobody has time to do it.' Embedding into procurement teams engagement practitioners with the specific remit to foster relations with the entrepreneurial community can help to address this gap. As they gain familiarity with the concerns of start-ups, engagement leads can also play a critical role in professionalising the provision of feedback from smaller suppliers

74 Geoff Orazem et al., 'Why Startups Don't Bid on Government Contracts' (Boston Consulting Group and Eastern Foundry, 22 August 2017), <https://www.bcg.com/en-gb/publications/2017/public-sector-agency-transformation-why-startups-dont-bid-government-contracts.aspx>.

75 Ben Miller, 'Startup ZenCity Raises \$6M from Investors, Including Microsoft's Venture Arm', Government Technology, 6 September 2018, <http://www.GovTech.com/biz/Startup-ZenCity-Raises-6M-from-Investors-Including-Microsofts-Venture-Arm.html>.

76 <https://www.gov.uk/guidance/doing-business-with-government-a-guide-for-smes>.

77 Rob Driver, 'Procuring the Smarter State: Key Steps to Promote Innovation and Growth in the Public Sector' (London: techUK, 2018), <https://www.techuk.org/insights/reports/item/12186-procuring-the-smarter-state>, p. 10.



Screenshot: <https://www.supplierjourney.scot/journey-overview>, 8 January 2019.

to public sector procurers. These engagement practitioners require a ‘translator’ skillset (see R7) and pre-existing GovTech networks or the capacity quickly to develop them.

**Strategic market engagement requires making the languages and processes of government procurement comprehensible to non-traditional suppliers.**

In many countries, current levels of procurement illegibility risk both obfuscating the primary task of the organisation – to better serve citizens – and undermining trust.<sup>78</sup> Written evidence from one UK procurement process epitomises broader international failings: it found the language of the procurement documents to be ‘mostly irrelevant’ to potential bidders, requiring ‘agencies to appoint lawyers to translate the language and understanding’ for them.<sup>79</sup> Few governments provide comprehensive and accessible explanation. A stand-out exception is the Scottish Government, which in 2018 launched [www.supplierjourney.scot](http://www.supplierjourney.scot), offering clear and comprehensive information on public sector procurement to current and potential bidders (see Box 2). Other governments can learn from this example.

**BOX 2  
Scottish Government Procurement Information Website**

The free website offers a step-by-step guide (see above) to the Scottish procurement process, a glossary of procurement terms, and useful links. It ‘translates’ procurement jargon and legislation, explaining key elements of Scottish public procurement. It also provides details of Prior Information Notices, Contract Notices, Contract Award Notices and Contract Registers, explicating how companies can use this information for bid planning. As a living resource, the website will reflect legislative changes, making it a valuable resource for experienced as well as new suppliers. It is too early to measure the impact of the initiative, but there is little doubt that, if well publicised, it could become a key resource for both new and more experienced suppliers.

78 In light of André Spicer, ‘Shooting the Shit: The Role of Bullshit in Organisations’, *M@n@gement* 16, no. 5 (2013): 653–66, <https://doi.org/10.3917/mana.165.0653>.

79 ‘Government Procurement: Sixth Report of Session 2013–14’ (London: House of Commons Public Administration Select Committee (PASC), 19 July 2013), <https://publications.parliament.uk/pa/cm201314/cmsselect/cmpubadm/123/123vw.pdf>, p. 5.

#### 4) Keep lines of communication open

**As organisations, start-ups are often inexperienced but eager to learn. They may be unfamiliar with the languages and processes of government procurement.** Where start-ups present bids that are relevant but poorly framed for the public sector client, and ultimately unsuccessful, procurers should invest the time to provide relevant feedback. Many start-ups express being deterred from public sector bids by a poor initial experience (sometimes through primary contractors).<sup>80</sup> Feedback can help to ensure that start-ups do not abandon the public sector market after one failed attempt—with the public sector losing access to their solutions—but instead return to make better executed bids that clearly articulate cost effectiveness and product-market fit in procurable language.

#### 5) Manage procurement timeframes

**There is no magic formula for the length of a tender process, but several key considerations for procurers are critical for engaging smaller companies.** Long procurement processes pose difficulties for start-ups, whose month-to-month cash flow—and thus existence—may depend on winning work (and presenting contracts in hand to potential investors) and being paid in a timely manner. Otherwise, their 'liquidity and profits can be impaired, reducing economic growth.'<sup>81</sup> Despite these detrimental effects, of 77 economies measured by the World Bank in 2016, payment was timely in only one-third, with delays standard across regions.<sup>82</sup>

- **Pre-solicitation focuses on clear definition of procurement process and challenge rather than on prescribing a fixed solution**  
Beneficial to start-ups who may have innovative solutions that procurers have not considered
- **Solicitation focuses not only issuing call through official channels but also actively engaging the entrepreneurial community**  
May contribute to diversifying the applicant pool and increasing quality by reaching more and more innovative companies
- **Evaluation includes in person contact for pre-qualifying proposals**  
Beneficial to smaller companies less experienced in public sector bid-writing than large technology providers  
Encourages relationship-building between public sector and smaller companies
- **Contract awarded quickly**  
Increases efficiency, enabling work to begin immediately  
Emphatic to revenue needs of start-ups with limited funding and benefits of drawing contracts awarded for start-ups that are fundraising

Government of Canada Open by Default Procurement Pilot (2017). Analysis: Bennett Institute

**Excessively short submission deadlines can also disfavour smaller companies, as they may have limited in-house capacity to quickly turnaround bids when compared to larger firms. They may also lack templates from previous bids, which speed up bid-writing for incumbent suppliers.** It may be easier for the largest firms, with big in-house contract bidding teams, to respond to tenders with short submission deadlines.<sup>83</sup> Procurers should identify mechanisms for providing start-ups with sufficient time to bid, while condensing later-stage timeframes by speeding up internal processes where possible, particularly surrounding contract awarding and payment delays. The bidding process for the design of the Canadian Open by Default Procurement Platform (see Box 3) exemplifies this approach.

80 Geoff Orazem et al., 'Why Startups Don't Bid on Government Contracts' (Boston Consulting Group and Eastern Foundry, 22 August 2017), <https://www.bcg.com/en-gb/publications/2017/public-sector-agency-transformation-why-startups-dont-bid-government-contracts.aspx>.

81 'Benchmarking Public Procurement 2016: Assessing Public Procurement Systems in 77 Economies' (Washington, DC: World Bank Group, 2016), <https://openknowledge.worldbank.org/bitstream/handle/10986/22649/9781464807268.pdf?sequence=1>, p. 17.

82 Higher income economies nonetheless performed best. 'Benchmarking Public Procurement 2016: Assessing Public Procurement Systems in 77 Economies' (Washington, DC: World Bank Group, 2016), <https://openknowledge.worldbank.org/bitstream/handle/10986/22649/9781464807268.pdf?sequence=1>, p. 14.

83 Nick Davies et al., 'Government Procurement The Scale and Nature of Contracting in the UK' (London: Institute for Government, December 2018), [https://www.instituteforgovernment.org.uk/sites/default/files/publications/IfG\\_government\\_procurement\\_web3.pdf](https://www.instituteforgovernment.org.uk/sites/default/files/publications/IfG_government_procurement_web3.pdf), p. 16.



### BOX 3

#### Government of Canada Open by Default Procurement Pilot (2017)<sup>84</sup>

The Treasury Board of Canada Secretariat (TBS) and Public Services and Procurement Canada (PSPC) took up the challenge of bid time management when they co-designed a bidding process for the TBS Open by Default Procurement Platform, which enables Canadian government departments to make documentation and data publicly available.<sup>85</sup> They recognised that access to a wide supplier pool with varied ideas might help them to achieve the best outcome, and thus sought both to avoid prescriptiveness, 'to allow as much innovation and creativeness as possible', and design a supplier-friendly process. While observing procurement requirements, they were able to award the contract within 24 hours of making a contracting decision, thus removing the burden of an extended waiting game for bidders, including innovative smaller firms.<sup>86</sup>

### 6) Disaggregate contracts

**Governments are beginning to explore contract disaggregation, or the division of large contracts into smaller and less risky work programmes.** In the UK, a 10% decrease in the overall value of public procurement was accompanied by a 20% rise in number of contracts awarded (increasing

to 40,130) in 2018.<sup>87</sup> Although the number of contracts awarded to SMEs dropped in the same period, contract aggregation *could* benefit smaller firms because of greater willingness to contract from unfamiliar providers, and to explore more innovate options, on smaller contracts that carry less risk.

**Contract disaggregation of cloud-based services may also enhance security by mitigating the risk of leaving huge amounts of work and data on one cloud.**<sup>88</sup> However, policymakers must then work to ensure interoperability between clouds: with shared standards, providers are fungible. Without, departments and agencies risk becoming chained to single cloud providers.

### 7) Bring frontline civil servants into the purchasing decision-making process

**Frontline civil servants are often responsible for the usage of GovTech products.** Their specialist knowledge places them well to play a key role in procurement decision-making, and there are clear use cases of GovTech companies scaling on the basis of early frontline support.<sup>89</sup> From an investment perspective, financiers acknowledge being compelled by stories of frontline civil servants, from teachers to nurses, being enthused by a product. They view it as a sign of potential scalability. Strong connectedness between national technology procurers and city and state-level purchasing decisionmakers could help to bring companies that local frontline civil servants appreciate to the attention of central government procurers.

84 Visualisation of the procurement process: Jaime Boyd, 'Canada's Open by Default Procurement Pilot: An Experiment in Agility', Medium (blog), 27 September 2017, <https://medium.com/@jaimieboyd/canadas-open-by-default-procurement-pilot-an-experiment-in-agility-e10c9acd5806>.

85 Alex Benay, 'The Open by Default Pilot: An Experiment in Radical Transparency', Government of Canada (blog), 21 July 2017, <https://open.canada.ca/en/blog/open-default-pilot-experiment-radical-transparency>.

86 Jaime Boyd, 'Canada's Open by Default Procurement Pilot: An Experiment in Agility', Medium (blog), 27 September 2017, <https://medium.com/@jaimieboyd/canadas-open-by-default-procurement-pilot-an-experiment-in-agility-e10c9acd5806>.

87 'Contract Disaggregation Proves Lessons Are Being Learned from Carillion's Collapse', Health Estates and Facilities Management Association, 4 January 2018, <https://www.hefma.co.uk/about-us/news/item/contract-disaggregation-proves-lessons-are-being-learned-from-carillion-s-collapse>.

88 Beverley Head, 'Hybrid Cloud in Australian Government Removes Supplier Lock-In', 7 December 2018.

89 Investing in GovTech: The Outlook for the Venture Market - The GovTech Summit 2018, The GovTech Summit (Paris, 2018), <https://www.youtube.com/watch?v=LNqMSgUieZQ>.

## 4. Ensure the provision of appropriate, and often patient, financing

**The question of how GovTech should be financed will rise to prominence in the coming years as an increasing number of companies, buoyed by an enthusiastic ecosystem and recognising the size of the market, seek to enter the space.** Before considering *who* is best placed to finance GovTech, it is crucial to consider the qualities of the financing that GovTech requires. At the current stage of ecosystem maturity, a critical quality is patience, or investment accepting of uncertain conditions and long and inexact timeframes.

**Patient capital has historically been crucial to the development of high-risk technology sectors that address questions of basic technological feasibility, such as biotechnology and nanotechnology.** Patient capital investors—often public funding bodies that are more willing (and often better equipped) to bear risk than private investors—exhibit a strong alignment with the missions of their investments, and a willingness to bet ‘long’ on them. In contrast to these traditional ‘high-risk’ investment categories, many GovTech ventures sit at the applied end of the innovation lifecycle, sidestepping the uncertainties of basic technological feasibility. Yet their risk profile—including working to slow-moving and often unclear demand-side timeframes—means that they, too, require time, and the attendant patient financing, to grow.<sup>90</sup>

**Private venture capitalists, whose financing many GovTech founders seek, often expect sizeable returns on their investments in just three to five years.** Yet GovTech enterprises need time to build public-sector knowledge and relations. Funding deployed with a demand for unrealistically speedy profit could harm the GovTech industry by curtailing the time available to entrepreneurs to grasp and navigate the most precarious aspects of their enterprise. Mismatched timeframes could yield a cohort of companies that fail to acquire the depth of experience to negotiate government procurement processes or build familiarity with institutional cultures and key decision makers in the departments into which they seek to sell. Even entrepreneurs with public-sector backgrounds are unlikely to have extensive knowledge of multiple departments across several governments.

**Lack of time to correct this inexperience could collapse individual GovTech enterprises or push them to pivot from the public sector towards quicker private sector wins.** Companies serving both markets may retract from the public sector.<sup>91</sup> This departure could limit knowledge diffusion across the industry, stunting its capacity to mature.<sup>92</sup> Public and private funders must seek to mitigate the risks of misaligned timeframes as they design funding provisions, where appropriate making them patient-by-design.

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90 Tanya Filer, ‘In GovTech Investment, Patience Is a Virtue’, Bennett Institute for Public Policy, University of Cambridge (blog), 25 September 2018, <https://www.bennettinstitute.cam.ac.uk/blog/GovTech-investment-patience-virtue/>.

91 In several countries start-ups whose products are suitable for both markets report focusing on the private sector only because the public sector barriers seem too high.

92 On the negative impact of venture capital on the early years of biotechnology, see Gary Pisano, ‘Can Science Be a Business?: Lessons from Biotech’, Harvard Business Review, October 2006, <https://hbr.org/2006/10/can-science-be-a-business-lessons-from-biotech>.

**In more mature GovTech contexts, patience may be a less critical quality.** Investors argue that in the US, the most mature GovTech market, traditional VC timeframes are feasible (particularly for companies selling at the city- and state-level)—but the market is still too young to provide strong evidence either way. Entrepreneurs also note that US city governments can be quick to procure and implement new products.<sup>93</sup> Outside the US, promising, if anecdotal, signs are also evident. Yet, positive examples remain limited: for most entrepreneurs seeking government contracts, slowness continues to be the norm, with protracted procurement and payment processes prevalent globally.<sup>94</sup>

**Given these circumstances, investors best placed to finance GovTech ventures in many national contexts will be those willing and able to:**

**I. Invest with patience,** against a timeframe reflective of the qualities of the local market and international markets into which investees seek to enter

**II. Perform a ‘connector’ function,** introducing start-ups to relevant procurement decisionmakers and processes

**These considerations lead to the question of who should finance GovTech.** A variety of funders may be well placed to support GovTech, including national funding bodies, private investors and regional development banks.<sup>95</sup>

## Recommendation

**1) Policymakers must carefully consider which funding option(s) are best suited to their local context and their ambitions for the local GovTech industry.**

On the basis of that assessment they can identify mechanisms for directly funding GovTech and / or incentivising other finance providers to do so. Funders may include:

### **I. Public Funding**

**National public funding bodies have historically proven adept at providing patient finance to high-risk technology sectors through alignment with the missions of their investments, and a willingness and capacity to see them as long-term investments.**<sup>96</sup> In many countries, there are several indicators that this route may also be a sound vehicle for GovTech financing. They include:

- A high degree of mission-alignment with the development of the sector overall and with specific sub-sectors (administrative reform, citizen engagement, etc.)
- Experience of offering patient capital to other technology-based sectors
- Experience with the demand-side barriers of working with government
- Well placed to build connections between GovTech companies and public sector purchasing decision-makers<sup>97</sup>

<sup>93</sup> Ben Miller, 'Startup ZenCity Raises \$6M from Investors, Including Microsoft's Venture Arm', Government Technology, 6 September 2018, <http://www.GovTech.com/biz/Startup-ZenCity-Raises-6M-from-Investors-Including-Microsofts-Venture-Arm.html>.

<sup>94</sup> 'Benchmarking Public Procurement 2016: Assessing Public Procurement Systems in 77 Economies' (Washington, DC: World Bank Group, 2016), <https://openknowledge.worldbank.org/bitstream/handle/10986/22649/9781464807268.pdf?sequence>.

<sup>95</sup> In many countries it may be more challenging for philanthropic capital to be channelled directly towards GovTech firms, despite mission-alignment, as foundations are often not set up to make for-profit investments. On the US case, see Knight Foundation and Rita Allen Foundation, 'Scaling Civic Tech: Paths to a Sustainable Future' (Knight Foundation, 31 October 2017), <https://knightfoundation.org/reports/scaling-civic-tech>, p. 27.

<sup>96</sup> Mariana Mazzucato and Gregor Semieniuk, 'Public Financing of Innovation: New Questions', Oxford Review of Economic Policy 33, no. 1 (2017): 24–48, <https://doi.org/10.1093/oxrep/gnw036>.

<sup>97</sup> This advantage assumes strong connectedness and may not stand in the context of extremely siloed public sectors.

- Well placed to identify potential network effects of GovTech products and opportunities to scale cross-governmentally and to other markets<sup>98</sup>

**Advantages to the public sector of directly funding GovTech include:**

- Ensuring funding mechanisms are aligned with national vision of the role of technology in the future of government
- Ensuring funding mechanisms are aligned with broader ambitions for a digital society and economy, as articulated, for example, in national industrial strategies
- Ensuring funding is channelled to genuine challenges of governance that may benefit from skills beyond those of traditional government 'insiders' or incumbent technology giants alone
- Enabling public sectors to gain awareness of new and emerging technologies of relevance to the public sector prior to the procurement stage

**Public investment in GovTech may help both to address the GovTech funding deficit and to stimulate investment in the industry among private investors.** Many GovTech companies report receiving private venture backing only after receiving seed or pre-seed funding from public funders, with the state removing the earliest risk. Private investors note that seeing public funders sufficiently interested in a GovTech company to invest taxpayer money into it, however small the amount, provides an assurance of product-market fit that they value.<sup>99</sup>

**The need for assurance—initial government funding as a springboard for later VC investment—reflects the youth of the ecosystem in most countries.** Currently, few private investors have direct experience of working in government or in a GovTech start-up. Company board members are often drawn from the rank of investors, so GovTech start-ups may also lack board members experienced in working with government. As GovTech start-ups begin to grow and enjoy financial success, and some of their founders become investors and advisors in the sector—in a process known as 'entrepreneurial recycling'—it is probable that (I) private investors will become more willing to take on the risks inherent to GovTech and (II) some risk will diminish as the industry matures and there is stronger proof of government receptivity to procuring from GovTech companies.<sup>100</sup> When this level is ecosystem maturation is achieved, the need for state-backed financial incentivisation or early-stage funding may diminish (though the industry may still represent a sound investment choice for public funders).<sup>101</sup> The industry may nonetheless still represent a sound investment for public funders, not least where equity is taken.

**Public funders can also consider co-investment, providing private investors with an avenue for risk-(and reward-) sharing as they explore a new industry.** In the UK, the British Business Bank co-invests with private investors, including in funds oriented towards public challenges (see Box 4).

98 This advantage also assumes strong connectedness and may not stand in the context of extremely siloed public sectors.

99 One US-based investor argued that state funding could be viewed as a sign of 'failure' on the private market, though this interpretation appeared a minority view, and may reflect the size of the private investment landscape in the US when compared to other markets.

100 Colin Mason and Ross Brown, 'Entrepreneurial Ecosystems and Growth Oriented Entrepreneurship', Background Paper (The Hague: OECD, January 2014), <http://www.oecd.org/cfe/teed/Entrepreneurial-ecosystems.pdf>, p. 10.

101 The Israeli high-technology sector provides an example. Initially stimulating R&D in the high technology sector through a suite of grant programmes, the state retracted from the funding landscape as the sector became self-sustaining.

#### BOX 4

#### British Business Bank Co-Invests in Technologies for National Security

British Business Bank (BBB), a state-owned economic development bank focused on SMEs, has established a National Security Strategic Investment Fund to provide patient capital investment for advanced technologies that contribute to national security. The Bank expects investment partners to follow an investment strategy with a 'significant element' focused on HM Government's National Security Strategic Technology Areas of Interest.<sup>102</sup> The Bank assesses the technical expertise of the private investors for investing in dual-use advanced technologies and approves the investment strategy that they design. Like the 'challenge' model of GovTech procurement, the Bank evaluates rather than prescribes, maximising external expert input.

### II. Private Venture Capital

**The argument that GovTech requires patient financing does not exclude private investors from usefully and profitably funding GovTech ventures.** Although private investors have historically viewed GovTech as too high-risk, some VCs have begun to indicate openness to GovTech as an investment category, and to offer patient investment. A few funds, principally focused on developed markets, are exclusively dedicated to GovTech.<sup>103</sup> They note positive qualities of GovTech as an investment class, including 'a clear customer that can pay' and 'relatively defined benchmark metrics to look for when conducting diligence on an investment.'<sup>104</sup>

### III. Corporate Investment

**Corporate acquisitions of GovTech start-ups and corporate VC interest in the sector appears to be increasing.** In 2016, Google acquired Urban Engines, an urban mobility start-up that combines big data and urban analytics. Google now sells these data analysis and visualisation services to municipalities around the world. M12, the venture fund of Microsoft (one of the biggest public sector technology vendors in many countries) has also invested in GovTech. In the US, several large technology providers including Oracle are buying GovTech start-ups to increase their innovative capacity.

**Corporate investors co-sell investee products with their own technology products, with an eye to acquiring top-performing portfolio companies.** The rapprochement between corporates experienced in public sector sales and less connected start-ups may help to build profitable, global companies, and bring innovation into the public sector. But it is unlikely that the relationship will, in the long run, boost competition, as large technology companies seek to acquire their most successful portfolio companies.

**Many policymakers cite competition in public procurement as a principal objective in nurturing a GovTech sector.** Where increased and higher quality competition is a long-term ambition, they must diversify the range of funding options available and incentivise GovTech firms to consider alternative scenarios to acquisition.

102 'The National Security Strategic Investment Fund', British Business Bank, <https://www.british-business-bank.co.uk/national-security-strategic-investment-fund/>.

103 Funds include: GovTech Fund (US-based); GovTech Fund and Sunstone Technology Ventures (Germany-based, Europe-focused); Public (principally UK and France-based, Europe-focused).

104 Knight Foundation and Rita Allen Foundation, 'Scaling Civic Tech: Paths to a Sustainable Future' (Knight Foundation, 31 October 2017), <https://knightfoundation.org/reports/scaling-civic-tech>, p. 31.

## IV. Blended Finance

**Blended finance, in which public or philanthropic funds and private funds are used to co-invest in costly global projects, has drawn high-level international support as a mechanism for achieving the Sustainable Development Goals (SDGs).** By some definitions, blended finance is focused on strategically engaging public or philanthropic development capital to mobilise additional private commercial finance *specifically* for SDG-related investments.<sup>105</sup> Multilateral organisations including the OECD and UN argue that blended finance encourages private funders to invest in sectors and geographies that they typically avoid by helping to de-risk these investments and by facilitating the entry of private investors into emerging markets with strong growth potential.<sup>106</sup>

**A subsector of GovTech products and services feed directly into the SDG agenda, and is thus eligible for SDG-focused funding.** GovTech companies tackling policy areas including urban development, mobility, education, and healthcare, particularly in the global South, could be eligible investees of blended finance. The Portuguese GovTech programme specifically focuses on the SDGs, a model on which other governments could draw.<sup>107</sup> Global and regional development banks are

also beginning to express interest in GovTech and could play a major role in SDG-related GovTech investment.<sup>108</sup>

**Governments should ensure that information on SDG funding opportunities are readily accessible to the local GovTech community.** They can usefully educate GovTech entrepreneurs on presenting their ventures as investible projects, articulated in the language of the SDGs. They should also ensure that blended finance decisionmakers fully understand the potential value of GovTech for tackling the SDGs (for examples, see Box 5). While development professionals acknowledge digital technologies as 'perhaps the greatest single enabler of sustainable development in the coming years,' fewer emphasize the utility of innovative technological uptake by governments for realising the SDG agenda.<sup>109</sup>

<sup>105</sup> 'Better Finance, Better World: Consultation Paper of the Blended Finance Taskforce' (London: Business & Sustainable Development Commission (Blended Finance Taskforce), 2018), p. 22 [http://s3.amazonaws.com/aws-bsdc/BFT\\_BetterFinance\\_final\\_01192018.pdf#asset:614:url](http://s3.amazonaws.com/aws-bsdc/BFT_BetterFinance_final_01192018.pdf#asset:614:url).

<sup>106</sup> 'Better Finance, Better World: Consultation Paper of the Blended Finance Taskforce' (London: Business & Sustainable Development Commission (Blended Finance Taskforce), 2018), [http://s3.amazonaws.com/aws-bsdc/BFT\\_BetterFinance\\_final\\_01192018.pdf#asset:614:url](http://s3.amazonaws.com/aws-bsdc/BFT_BetterFinance_final_01192018.pdf#asset:614:url); OECD, 'OECD DAC Blended Finance Principals for Unlocking Commercial Finance for the Sustainable Development Goals' (OECD, January 2018), <http://www.oecd.org/dac/financing-sustainable-development/blended-finance-principles/>.

<sup>107</sup> <https://GovTech.gov.pt/>.

<sup>108</sup> For example, Theodore Kahn, Alejandro Baron, and Juan Cruz Vieyra, 'Digital Technologies for Transparency in Public Investment', Innovation in Citizen Services Division Discussion Paper (Inter-American Development Bank, November 2018), <https://publications.iadb.org/bitstream/handle/11319/9303/Digital-Technologies-for-Transparency-in-Public-Investment.pdf?sequence=1&isAllowed=y>; Renaud Seligmann, 'Is GovTech the Missing Ingredient to Curb Corruption?', The World Bank, Governance for Development (blog), 11 December 2018, <https://blogs.worldbank.org/governance/GovTech-missing-ingredient-curb-corruption>.

<sup>109</sup> TWI2050 - The World in 2050, 'Transformations to Achieve the Sustainable Development Goals' (Laxenburg, Austria: International Institute for Applied Systems Analysis (IIASA), July 2018), p. 21, <http://pure.iiasa.ac.at/15347>.

## BOX 5

### GovTech start-ups supporting SDGs (examples)<sup>110</sup>

- **SDG3: Good health and wellbeing**

Statwig (India), funded by UNICEF Innovation Fund, aims to use blockchain technologies to ensure efficient delivery of vaccines through enhancing supply-chain management

- **SDG9: Industry, Innovation and Infrastructure**

Project Isizwe (South Africa), a not-for-profit, partners with government to roll-out free WiFi in low-income communities

- **SDG11: Sustainable cities and communities**

Cityflag (Mexico/US) provides technologies to facilitate direct interaction between local governments and citizens

- **SDG15: Life on Land**

INFORMAT (Portugal), winner of govtech, the Portuguese government competition, develops intelligent forest management technologies

- **SDG16: Peace, Justice, and Strong Institutions**

Votem (US) provides a mobile voting platform design for securely casting votes

<sup>110</sup> Project Isizwe is not a GovTech firm but works with government and enables better connectivity between citizens and governments.

## 5. Engage academia at each stage of the GovTech innovation lifecycle

**From cyber security to advanced manufacturing, few innovation ecosystems have developed in which academia has not played a major role.** Across technology sectors, universities play a crucial role in stimulating innovation both by exposing businesses to ideas that they may not have previously considered, and by helping them to understand the limits of what is technologically possible or ethically desirable. They contribute to the full lifecycle of technological development: providing training and building human capital; enabling knowledge transfer and access to new ideas; developing technological spin-offs that convert academic research into high value commercialisation ventures; and providing support on issues of ethics and governance. Entrepreneurs in R&D-intensive technology sectors have suggested, furthermore, that university collaboration schemes are among the most valuable assets that that an ecosystem can provide to them.<sup>111</sup> University involvement in ecosystem development has not always occurred organically: governments have often played a key role in successfully facilitating the process, providing the conditions for interconnectivity between industry, policymakers and academia.

**To date, universities are often not well embedded into GovTech innovation ecosystems.** There is little university-led GovTech incubation or knowledge transfer. In most countries academics have not played a significant role in overarching GovTech

policy or ecosystem design. This lack of connection goes hand in hand with a relative sparsity of GovTech-focused research.<sup>112</sup> Although an extensive literature on digital or e-government exists, scant scholarship parses GovTech as an industry or ecosystem. Related literature on smart cities and digital health often focuses more on regulation than innovation (though these dimensions of course intertwine).

**A further factor determining the relative absence of academia from the GovTech ecosystem may be the difference in the disciplinary profiles relevant to GovTech compared to other technology innovation ecosystems.** GovTech entrepreneurs often focus on novel applications of existing or emerging technologies in the public sector rather than on the development of radically new technologies. This accent on public policy applications means that GovTech knowledge transfer must extend beyond technological and scientific expertise alone to include cutting-edge public policy research focused on an overarching institutional level and on specific public policy domains.

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<sup>111</sup> Dan Breznitz, 'Collaborative Public Space in a National Innovation System: A Case Study of the Israeli Military's Impact on the Software Industry', *Industry and Innovation* 12, no. 1 (2005): 31–64, <https://doi.org/10.1080/1366271042000339058>.

<sup>112</sup> Exceptions include the 'AI for policymaking' project at the Alan Turing Institute, London, and the GovLab at New York University. This guide forms part of the Digital State Project at the Bennett Institute for Public Policy, of which GovTech is a major research focus. Universities are beginning to contribute to other dimensions of GovTech ecosystem creation, including education and commercialisation. The entrepreneurship programme at the Judge Business School, Cambridge, offers a GovTech Specialist Pathway. IE PublicTech Lab (Madrid) will offer an accelerator programme.



## Recommendations

### 1) Fund GovTech-critical multidisciplinary R&D that falls between discipline-specific funding bodies

**Funding can be engaged to 1) boost underdeveloped or strategically advantageous GovTech subsectors and 2) help to create the necessary underlying conditions for GovTech to flourish.** For example, research into the human interpretability of AI may help to increase public confidence in its public sector deployment.<sup>113</sup>

### 2) Collaborate on the creation and use of collaborative public space (CPS)

**CPS constitutes space specifically designed to create trust among multiple stakeholders who lack familiarity or mutual trust.** In CPS, actors who usually hesitate to share fully information and collaborate with each other because of their different, and often competitive, positions in the market, willingly do so.<sup>114</sup> Activities in CPS, including commercialisation projects, have been proven to enhance both the capabilities and economic opportunities of the participants and those of industrial systems overall.<sup>115</sup> As multidisciplinary organisations that are often both connected to the private and public sectors, and relatively independent of both, universities may be well placed to host and coordinate government-supported GovTech CPS (for example, see Box 6).

## BOX 6

### Tel Aviv University and the Israel Security Authority Join Forces

TAU Ventures, the venture arm of Tel Aviv University, partnered with the Israel Security Authority, to create Xcelerator, an early-stage accelerator targeting entrepreneurs working (in the first instance) on AI, primarily natural-language processing (NLP) technologies, robotics, and data science.<sup>116</sup> The ambition is to attract entrepreneurs who already have a technological proof of concept but were not necessarily oriented towards the homeland security industry prior to the programme. Selected entrepreneurs were provided with office space, access to both technological and counterterrorism experts, mentorship from academics and industry professionals and a grant of \$50,000 with no equity or restrictions. Tel Aviv University has historical strengths both in engineering (25% of Israeli entrepreneurs are reportedly alumni of Tel Aviv University) and security and political analysis, making it an ideal centre for GovTech creation from an R&D perspective. It also has strong experience of commercialising academic research, and a pre-established financial mechanism, through TAU Ventures, for funding or co-funding high-risk technological projects.

113 Research into the human interpretability and explainability of AI includes the Defense Advanced Research Projects Agency (DARPA) XAI Programme, <https://www.darpa.mil/program/explainable-artificial-intelligence>.

114 Dan Breznitz, 'Collaborative Public Space in a National Innovation System: A Case Study of the Israeli Military's Impact on the Software Industry', *Industry and Innovation* 12, no. 1 (2005): 31–64, <https://doi.org/10.1080/1366271042000339058>, p. 37.

115 Dan Breznitz, 'Collaborative Public Space in a National Innovation System: A Case Study of the Israeli Military's Impact on the Software Industry', *Industry and Innovation* 12, no. 1 (2005): 31–64, <https://doi.org/10.1080/1366271042000339058>, p. 37.

116 Yasmin Yablonko, 'ISA and TAU Ventures Launch Startup Accelerator', *Globes*, 9 May 2018, <https://en.globes.co.il/en/article-isa-and-tau-ventures-launch-startup-accelerator-1001235281>.

### 3) Engage academics for training purposes and as 'critical friends'

**University-based experts can be engaged to provide tailored-training on core dimensions of GovTech, from the modernisation of public sector procurement processes to privacy considerations.** Policymakers can also draw on academic researchers 1) to receive supportive but critical advice and feedback on GovTech policy and programme design, including ethics and governance dimensions and 2) to measure the effectiveness of GovTech products, services, and programmes. In a recent example, the Georgia Research Alliance (GRA), a state-led non-profit organisation, awarded a grant for university research to measure the effectiveness of a case management system designed by Acivilate, a GovTech company in which GRA is an investor.<sup>117</sup>



<sup>117</sup> Ben Miller, 'Startup Aiming to Help Prisoners Return to Society Pulls in \$3M Seed Round', Government Technology, 11 December 2017, <http://www.GovTech.com/biz/Startup-Aiming-to-Help-Prisoners-Return-to-Society-Pulls-in-3M-Seed-Round.html>.

## 6. Build Technological Talent Pipelines, Emphasize Public Sector Opportunities

**Countries around the world suffer from a deficit of skilled developers, data scientists and engineers equipped to build and secure technological innovations and infrastructures for the coming decades.**<sup>118</sup> Unless addressed as a priority, this deficit will be detrimental to GovTech, alongside all other new and emerging technology sectors. Considering the centrality of technological skills to generating and sustaining economic prosperity, policymakers must urgently address this challenge.

**The following recommendations focus on producing pipelines of technological talent dedicated to addressing public sector needs specifically.** To this end, the recommendations place emphasis on providing experiences to school-age and university students that blend technological education and upskilling with exposure to GovTech projects, particularly around strategic national requirements and probable future skill needs.

### Recommendations

#### 1) Develop youth-focused cybersecurity programmes

**In one GovTech subfield, cyber security, some countries have already begun to take this approach.** In Israel, the National Center for Cyber Education (CEC), established in 2017, trains young people in cyber skills through programmes including after school clubs. CEC works closely with industry and academia to translate developments in the cyber field into curricula that respond to shifting industry

and defence needs. The UK also has a cyber programme focused on young people, the Cyber Security Challenge. Cross-regional cyber security programmes for young people are also emerging, as are government-run programmes for girls, designed to address the global gender gap in cyber security professions.<sup>119</sup>

**Given the criticality of cybersecurity for protecting both citizens and states, these youth-oriented programmes are promising.** Policymakers should carefully monitor and evaluate their effectiveness in encouraging students into cyber-oriented careers, including in and with the public sector. To evaluate outcomes, they will need to dedicate resources to maintaining contact with programme participants following their graduation and to collecting data on career outcomes.

#### 2) Provide and support GovTech-focused youth experiences

**To date, there are few examples of cognate youth-focused programmes to support GovTech needs more broadly.** Governments should consider drawing on the experiences of cyber programmes to provide opportunities for students to work on a range of GovTech challenges and to engage with practitioners. Current strategies, though limited, include competitions, internships and scholarships (see Table 2). A further method, hackathons, which typically collocate participants for brief periods, may help to generate enthusiasm and build valuable social ties but to have broad effect on technology development

118 'Facing the Storm: Navigating the Global Skills Crisis' (New York: IBM Institute for Business Value, December 2016).

119 [http://www.oas.org/en/scholarships/PAEC/2019/OAS\\_DiploHackStudentChallengeAnnouncement.pdf](http://www.oas.org/en/scholarships/PAEC/2019/OAS_DiploHackStudentChallengeAnnouncement.pdf); <https://www.cyberfirst.ncsc.gov.uk/girlscompetition/>.

**TABLE 2. Engaging Young People in GovTech**

Method	Example
Competition	Israel: Students Innovating in the Public Sector 4.0 (2018), a joint competition run by the Ministry of Justice and Google invited students at Ben Gurion University of the Negev to design GovTech solutions for the Ministry
Internship	US: The Civic Digital Fellowship run by Coding it Forward, a non-profit enables college students to spend 10 weeks over the summer working on technology, data science and design in federal agencies
University Field Course	Various: DPI-663 Tech Innovation in Government at Harvard Kennedy School of Government; The Digital State at IT University of Copenhagen; Courses on the dual-degree masters in e-government at the University of Indonesia and Victoria University Wellington
Scholarship	Singapore: The Smart Nation Scholarship funds attendance at university in Singapore or abroad of talented technology students in return for 4-6 years of government service focussed on technology.
Secondary-level education programme	UK: The Cyber Security Challenge
Hackathon	Argentina: Legiislative Hackathon (2017), student participation welcomed

is better conceived as part of longer-term programming.<sup>120</sup>

### 3) Work with universities to build the pipeline

**Practitioners should consider collaborating with universities on field courses in which students (of technology-based and other relevant disciplines) both study the relevant literature and apply their skills to real-world public sector challenges.** The approach can offer several benefits, including: encouraging local collaborations; demonstrating to students the possibility of impact at scale through public sector technology work; and creating opportunities for students to meet practitioners.<sup>121</sup> Such courses can have meaningful impact on ecosystem creation, including spawning companies. One student of DPI-663, a course at the Harvard Kennedy School focused on government technology,

explains that she not only received a job offer on the back of the class, but also became a ‘client’ for a later cohort.<sup>122</sup>

**Field courses are more easily developed where there are strong links between universities and the public sector.** As Rachel Douglas-Jones, convener of the Digital State module at IT University, Copenhagen, observes, ‘the boundaries between university and other sectors are very permeable in Denmark.’<sup>123</sup> This social capital facilitates collaboration, including guest lectures by policymakers from the Ministry of Digitalisation.

120 Erik H. Trainer et al., ‘How to Hackathon: Socio-Technical Tradeoffs in Brief, Intensive Collocation’, in CSCW ’16 Proceedings of the 19th ACM Conference on Computer-Supported Cooperative Work & Social Computing (19th ACM Conference on Computer-Supported Cooperative Work & Social Computing, San Francisco, 2016), <https://doi.org/10.1145/2818048.2819946>.

121 Chris Kuang, ‘Engaging the next Generation of Digital Leaders in Public Interest Technology’, Coding It Forward (blog), 26 October 2018, <https://blog.codingitforward.com/engaging-the-next-generation-of-digital-leaders-in-public-interest-technology-7ed28f2fa085>.

122 DPI-663 (Cambridge, MA) <http://innovategovernment.org/about/>.

123 Rachel Douglas-Jones to Tanya Filer, ‘The Digital State’, 4 January 2018.

## 7. Build translator capacity in the public sector

**Beyond the need for greater inhouse technological understanding, governments require skilled 'translators' equipped to navigate between with the different languages, cultures, priorities and ambitions both across the technological and policymaking dimensions of government and between technology firms and the state.**<sup>124</sup>

**Probably driven by pragmatic ends, some technology firms have more quickly grasped the need for these bicultural agents than governments.** Large technology firms have begun to recognise that as their work increasingly enters into the territory of public policy, from data leakage to online harms, 'Silicon Valley needs translators more than ever.'<sup>125</sup> A product management director at X, the R&D arm of Google focused on technologies with large-scale impact, self-defines as 'a translator' who excels at 'translating between engineers, technical people and non-technical people, who sometimes don't understand each other.'<sup>126</sup>

**Governments require similarly equipped translators, not least as they increasingly work with GovTech firms.** It is important that policymakers do not rely on industry alone to supply translators for their shared conversations, leaving them dependent on industry interpretations (translation is not a neutral exercise). A revolving doors approach—with skilled deciphers moving between industry and public sector roles—may also

be undesirable: such contiguity risks leaving governments susceptible to regulatory capture.

**Governments need instead to cultivate their own in-house translational capacities, as well as trusted external translators.** Not every translator needs in-depth subject matter expertise in engineering and public policy. It is about *sufficient* understanding, and what sufficiency means will vary depending on the particular policy and technology domains.

**These translational needs are one reason why, when we consider our future public sector skill needs, we should be cautious of being too one dimensional, prioritising technological capabilities above all else.** One useful suggestion is that job specifications for junior government technology roles include the 'ability to translate between technical and non-technical individuals.'<sup>127</sup>

### Recommendations

#### 1) Embed translators at all levels of the civil service in order to facilitate long-term cultural change.

In the UK, for example, the civil service fast stream—the elite graduate recruitment programme—could open a 'translator' track, just as it employs, and trains up, statisticians and social researchers. This would go beyond (and complement) its current technology-focused track.<sup>128</sup>

124 Tanya Filer, 'Government Needs New Translators to Help It Speak to the Tech Sector', Apolitical (blog), 20 December 2018, [https://apolitical.co/solution\\_article/translators-needed-government-tech-sector/](https://apolitical.co/solution_article/translators-needed-government-tech-sector/).

125 Hannah Kuchler, 'Google's Obi Felten: "You Can't Cast Half the Population as Villains and the Other Half as the Victims"', The Financial Times, 6 December 2018, <https://www.ft.com/content/1e336774-f827-11e8-af46-2022a0b02a6c>.

126 Hannah Kuchler, 'Google's Obi Felten: "You Can't Cast Half the Population as Villains and the Other Half as the Victims"', The Financial Times, 6 December 2018, <https://www.ft.com/content/1e336774-f827-11e8-af46-2022a0b02a6c>.

127 Chris Kuang, 'Engaging the next Generation of Digital Leaders in Public Interest Technology', Coding It Forward (blog), 26 October 2018, <https://blog.codingitforward.com/engaging-the-next-generation-of-digital-leaders-in-public-interest-technology-7ed28f2fa085>.

128 <https://www.faststream.gov.uk/digital-data-technology/>.

## 2) Embed translators in GovTech units

Most GovTech teams are highly delivery-oriented, focused on deadlines and deliverables. Given the experimental nature of their policy domain, they report an urgency to meet key performance indicators (KPIs) and to prove that their programmes add value. In light of these pressures, they often lack the bandwidth to undertake broader strategic and ethical thinking. Governments should consider embedding a translator function at the core of any GovTech team that it establishes with the mandate to provide leadership on these critical dimensions.

## 3) Map what 'enough' policy and technology understanding means across different policy domains and regarding individual technologies, and recruit translators accordingly

The depth of technological insight needed might differ depending on the specific technology being primed for public sector application, or according to the specific application for which it is intended.

## 4) Draw on universities, centres of multidisciplinary expertise, to seek out experts who are already equipped to move between technological and policy contexts

In some cases, researchers possessing these characteristics will be dispersed across numerous university departments. In others, there will be clear hubs of expertise that governments can approach directly.

## 5) Universities can also help to build the pipeline of translator talent

Most postgraduate degrees and qualifications in Public Policy recruit from diverse professional and disciplinary backgrounds,

including technology subjects. Candidates study public policy in detail alongside a cohort with collectively broad-ranging experience. Governments may sponsor technologists and engineers to study for these qualifications in return for a period of public service.

## 6) Consider introducing an 'Ambassador to Start-ups and SMEs' role

Countries including Denmark and France already have an 'Ambassador to the Technology Sector' or 'Ambassadors to Silicon Valley' (including example, Denmark and France) but their energies are typically focused on relationship-building with powerful large technology companies.<sup>129</sup> Their mandate is also often foreign companies. By introducing a role dedicated to smaller companies, including in the domestic market, governments can achieve two key outcomes: 1) Send a signal to the market of the commitment of government to working with and supporting smaller companies. 2) Serve as a key point of knowledge transfer between technology start-ups and the state. The position-holder would be well placed to encourage start-ups to consider the public sector market.

## 7) Place translators in agencies and departments, to contribute to procurement processes

Where countries have centralised offices for responsible technology innovation and national data governance, such as the newly launched Centre for Data Ethics and Innovation in the UK, these offices should also be inward-facing, guiding GovTech development and usage.<sup>130</sup> They will thus have a need for translators, who will play a powerful role in shaping how creators—of technologies and of policies—negotiate the ethics of their own inventions.

129 Chris Stokel-Walker, 'The First Silicon Valley Ambassador Is out to Make Nice with Tech Giants', *Wired*, 6 November 2017, <https://www.wired.co.uk/article/casper-klynge-first-ever-silicon-valley-tech-ambassador>; 'Digital Affairs – Appointment of an Ambassador', *France Diplomatie*, 22 November 2017, <https://www.diplomatie.gouv.fr/en/french-foreign-policy/digital-diplomacy/events/article/digital-affairs-appointment-of-an-ambassador-22-11-17>.

130 Tanya Filer, 'Governing GovTech', *Bennett Institute for Public Policy*, University of Cambridge (blog), 2018, <https://www.bennettinstitute.cam.ac.uk/blog/?page=3>.

## 8. Develop and Utilise Regional and International Networks

**Scaling enterprises across jurisdictions can present a major challenge for GovTech entrepreneurs.** In large economies with a multitude of municipal and state governments working within the same or similar regulatory frameworks, internationalisation may be less pressing. But for start-ups based in smaller economies, the capacity to sell abroad is critical to growth. In a competitive funding landscape in which GovTech companies vie for capital alongside other technology verticals, the capacity of a GovTech company to sell into multiple public sectors is often also a key consideration for investors.

**There is plentiful collaboration between national governments on digital government agendas.** The D9 membership group, committed to leadership in digital government, integrates countries from Uruguay to South Korea. Latin American digital government teams frequently collaborate via the Network of e-Government Leaders of Latin America and the Caribbean (Red GEALC), a regional network.

**Unsurprisingly given its newness, less attention has been paid by policymakers to building international connections for GovTech.** Yet the success of GovTech as an industry will depend on internationalisation, and governments should thus consider as part of their broader GovTech strategy how best to support internationalisation efforts. They must also keep track of international GovTech use cases to ensure knowledge of, and access to, the best products and services available for the domestic public sector.

### Recommendations

#### 1) Seek out international use cases

**Policymakers should seek to keep track of international GovTech use cases to ensure that they are aware of the most useful products and services on the market.** Developing GovTech as a common workstream in regional trade blocs and regional and international digital government networks may help with this effort.

#### 2) Promote the national GovTech industry

**Governments can help to promote the national GovTech industry, including through ensuring that it is represented at regional and international public sector conferences.** The approach has two principal advantages: 1) enabling agencies and departments to showcase how they have engaged innovation with positive outcomes 2) promoting individual companies that are serving the public sector well and GovTech as an ecosystem. There is already evidence that the approach works at the national level, with one GovTech investor estimating 50% of sales across his fund portfolio to come from governments referring other agencies, often through exhibiting use cases at public sector conferences or securing the attendance of companies with which they work.<sup>131</sup>

131 Investing in GovTech: The Outlook for the Venture Market - The GovTech Summit 2018, The GovTech Summit (Paris, 2018), <https://www.youtube.com/watch?v=LNqMSgUieZQ>.

### 3) Work towards developing common GovTech marketplaces

**As a longer-term objective, policymakers should consider supporting and developing the business case for regional GovTech marketplaces.** Where geopolitical circumstances allow for them, carefully governed regional marketplaces enabled by e-procurement could greatly facilitate the expansion of GovTech companies through providing them with quick access to multiple national tenders. Once verified, companies could sell into numerous departments and agencies regardless of national borders. This approach could also stimulate economies of scale, providing lower cost, higher quality procurement outcomes for public sectors and generating more and higher standard competition.<sup>132</sup>



<sup>132</sup> On arguments for the harmonization of government procurement in the European Union see Sangeeta Khorana, Kirsten Ferguson-Boucher, and William A. Kerr, 'Governance Issues in the EU's e-Procurement Framework', *Journal of Common Market Studies*, 2014, 1–19, <https://doi.org/10.1111/jcms.12179>, p. 2.



# Appendices

## Appendix 1.

### Sources and Methodology

**This guide focuses predominantly on GovTech at the national level, though draws occasionally on city-level examples.** The focus addresses an intellectual gap: most policy literature on government-SME collaboration addresses 'smart cities' policy rather than national technology initiatives. The principal data gathering tools on which this guide is based are desk research, fieldwork, and qualitative interviews with more than sixty policymakers, GovTech entrepreneurs, incubators and accelerators, and investors (private and public) based in Europe, the Middle East, Latin American, and Australasia.

**Empirical case studies are drawn from a variety of countries, including several from the UK and Israel, where the most intensive fieldwork was undertaken.** These countries, both founding members of the D9 ('Digital 9') alliance, are among the first whose national governments have deliberately undertaken efforts to cultivate a national GovTech ecosystem. The international examples showcased constitute recent efforts by governments to work with start-ups and SMEs to exploit the potential benefits of disruptive technologies for usage in the public sector. The methodological apparatus draws principally on innovation-focused Science and Technology Studies, and particularly the co-productionist strand, which both argues that science and technology and the social order exist in a mutually constitutive relationship and explores how to shepherd that relationship towards beneficial outcomes.<sup>134</sup>

**As GovTech is so young an industry, with scant data available even on the short-term impact of most government-lead GovTech policies and programmes, it is not possible to evaluate the long-term successes or failures of individual policies or programmes referenced here.** The examples provided are selected because they show early signs of success vis-à-vis intended or desirable outcomes, but they must nonetheless be understood as work-in-progress.

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134 Sheila Jasanoff, 'Future Imperfect: Science, Technology, and the Imaginations of Modernity', in *Dreamscapes of Modernity: Sociotechnical Imaginaries and the Fabrication of Power*, ed. Sang-Hyun Kim and Sheila Jasanoff (Chicago ; London: University of Chicago Press, 2015), 1–33; Sebastian Pfotenhauer and Sheila Jasanoff, 'Panacea or Diagnosis? Imaginaries of Innovation and the "MIT Model" in Three Political Cultures', *Social Studies of Science* 47, no. 6 (2017): 783–810.

## Appendix 2.

### Table 3. Recommendations for Addressing Individual GovTech Barriers

Risk of fragmentation and duplication when working with smaller technology providers	Scalability and generalisability of start-up product and services	Difficulty of ensuring accountability when technological solutions outsourced to private sector companies	Incompatibility of investor expectations and government sales' cycles	Divergent cultural factors and mod operandi (real and perceived) between start-ups and government	Inexperience of start-ups in working with government and vice-versa	Responsibility to balance experimentation with providing stability	Fear of public perception of failed experimentation	Politics, including lack of political will	Organisational structures and cultures that disincentivise experimentation and stoke fear of disempowerment	Over-reliance on individual digitisation'champions' in public sector	Long-held incumbent relationships and contracts with technology giants	Slow purchasing decision-making processes	Procurement systems no longer fit for purpose	Perception of digital innovation as extra, non-essential and peripheral work	Lack of interest or understanding regarding working with start-ups	Difficulty recruiting and retaining technological talent	Lack of technological understanding in the public sector	<i>Thinking about GovTech</i> Recommendation No.	1	2	3	4	5	6	7	8									
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## Appendix 3.

### Future Research Questions

This guide opens up a set of questions that require further investigation in order to shape national GovTech innovation ecosystems towards accountability and sustainability. Future research areas are numerous, and include:

#### **GovTech industry standards:**

What are the key drivers for creating GovTech standards and what are the areas in which standards would have the most impact and support?

#### **Use of data generated by citizens:**

How do citizens want data that they generate to be used in public-private partnerships, and how can governments best deliver on that vision, including where citizens express divergent viewpoints? How can new mechanisms, such as data trusts, contribute to data management and use?

#### **GovTech policy and programme design:**

What GovTech policy and programme design can best support the creation of a local GovTech innovation ecosystem and, where it is a priority, its internationalisation?

#### **Lesson learning from the development of earlier technology ecosystems:**

What lessons can be learned for GovTech from the development of earlier technology innovation ecosystems, including FinTech, that have sought to impact traditional, highly regulated sectors? How is GovTech distinctive from these earlier examples?

#### **Innovation and Regulation:**

How can sandboxing and piloting best be engaged to test GovTech products and services and provide regulators with insights into new technologies for the public sector, while ensuring that consumer protection is not waived?

#### **GovTech industry data:**

How can we construct and make available the necessary datasets to 1) ensure that public and private sector organisations are equipped to target and evaluate their support to GovTech companies and 2) assess the impact of the GovTech ecosystem on the public sector and as an industry of the economy?

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