



GOVERNANCE



GOVERNANCE

EQUITABLE GROWTH, FINANCE & INSTITUTIONS INSIGHT

CivicTech

Transparency, Engagement, and Collaboration
for Better Governance

Supported by the GovTech Global Partnership - www.worldbank.org/govtech



WORLD BANK GROUP

GovTech
Putting people first

Public Disclosure Authorized

Public Disclosure Authorized

Public Disclosure Authorized

Public Disclosure Authorized

© 2022 International Bank for Reconstruction and Development / The World Bank
1818 H Street NW,
Washington DC 20433
Telephone: 202-473-1000;
Internet: www.worldbank.org

This work is a product of the staff of The World Bank with external contributions. The findings, interpretations, and conclusions expressed in this work do not necessarily reflect the views of The World Bank, its Board of Executive Directors, or the governments they represent.

The World Bank does not guarantee the accuracy, completeness, or currency of the data included in this work and does not assume responsibility for any errors, omissions, or discrepancies in the information, or liability with respect to the use of or failure to use the information, methods, processes, or conclusions set forth. The boundaries, colors, denominations, and other information shown on any map in this work do not imply any judgment on the part of The World Bank concerning the legal status of any territory or the endorsement or acceptance of such boundaries.

Nothing herein shall constitute or be construed or considered to be a limitation upon or waiver of the privileges and immunities of The World Bank, all of which are specifically reserved.



Rights and Permissions

The material in this work is subject to copyright. Because The World Bank encourages dissemination of its knowledge, this work may be reproduced, in whole or in part, for noncommercial purposes as long as full attribution to this work is given.

Any queries on rights and licenses, including subsidiary rights, should be addressed to World Bank Publications, The World Bank Group, 1818 H Street NW, Washington, DC 20433, USA; fax: 202-522-2625; e-mail: pubrights@worldbank.org.



Contents

Acknowledgments	vi
Abbreviations and Acronyms	vii
Executive Summary	1
1. Introduction	6
2. Why CivicTech Matters	11
3. What Is CivicTech For?	15
3.1 Introduction	15
3.2 A Framework for CivicTech	16
3.3 Openness and Transparency	18
3.4 Participation and Engagement	21
3.5 Collaboration and Co-creation, Co-production, and Co-design	25
4. How to Adopt, Implement, and Assess CivicTech	28
4.1 Understand the Problem	30
4.1.1 Select the Appropriate Problem Issue	30
4.1.2 Identify the Stakeholders	30
4.1.3 Choose Stakeholder Representatives	31
4.1.4 Collect Stakeholder Views	31
4.1.5 Analyze What Has Been Learned	31
4.1.6 Document the Problem	32
4.2 Design	32
4.2.1 Identify the Appropriate CivicTech Type	32
4.2.2 Define a Minimum Viable Solution	33
4.2.3 Get Design Help, if Needed	33
4.2.4 Issue a Request for Information	34
4.2.5 Select the Technology	35
4.2.6 Specify the Minimum Functionality	35
4.2.7 Identify Organizational Changes Needed	36

4.3	Develop	36
4.3.1	Choose Development Approach	37
4.3.2	Issue a Request for Proposals	37
4.3.3	Select the Developer	38
4.3.4	Contract the Development	39
4.3.5	Manage the Contract/Development	39
4.3.6	Test the Solution	39
4.4	Implement	40
4.4.1	Build a Stakeholder Communication Plan	40
4.4.2	Plan the Implementation Process	40
4.4.3	Set up a Support Team	40
4.4.4	Launch the Solution	41
4.5	Evaluate	41
4.5.1	Design Assessment	42
4.5.2	Monitoring Implementation	42
4.5.3	Impact Evaluation and Feedback	42
4.6	Iterate	43
5.	Key issues for Successful CivicTech	44
5.1	Introduction	44
5.2	Citizens	45
5.2.1	Ensure the Representativeness of Participants and an Inclusive CivicTech Approach	45
5.2.2	How to Manage Conflicting Positions Among Citizens	46
5.2.3	How to Manage Citizens' Expectations	47
5.3	Government	48
5.3.1	How CivicTech Changes Communication Between the Government and Citizens	48
5.3.2	How to Increase the Responsiveness of Government Through CivicTech Approaches	49
5.3.3	How to Assess the Effectiveness of CivicTech	50
5.4	Technology	51
5.4.1	Which Technology Infrastructure for Inclusiveness?	51
5.4.2	What Considerations Inform Selection of Technological Approach?	52
5.4.3	Building, Buying, Renting, or Repurposing CivicTech Solutions	53

5.5 Foundations	54
5.5.1 What Are the Building Blocks for Successful CivicTech Implementation?	54
5.5.2 How Are Building Blocks of Fundamentals Set Up to Adopt and Effectively Implement Sustainable CivicTech?	55
5.5.3 How to Motivate Citizens' Participation	55
6. Conclusion	57
Notes	60
References	63
Annex: Types and Examples of CivicTech Solutions	71

Figures

Figure ES.1 . Three Levels of CivicTech	2
Figure ES.2. The CivicTech Solution Cycle	3
Figure 1. State of Citizen Engagement, by GTMI Group, as of December 2020	8
Figure 2. CivicTech How-to-Note: Structure of Contents	9
Figure 3. Three Levels of CivicTech	17
Figure 4. The CivicTech Solution Cycle	29
Figure 5. Key Issues of CivicTech	45

Tables

Table ES.1. Key Issues for Successful CivicTech	4
Table 1. Guiding Principles for Design Evaluation	34
Table 2. The Pros and Cons of Outsourced Versus In-House Development	37
Table 3. Guiding Principles for Evaluating RFP Responses	38
Table 4. Three Dimensions of Assessment	41

Boxes

Box 1. GovTech Dataset on How to Manage Citizens' Expectations	7
Box 2. Digital City Services in Ronda, Spain	19
Box 3. Kenya Open Data	19
Box 4. Municipal Spending in South Africa	20
Box 5. 311 Systems in United States of America	21

Box 6. Nyeri Water and Sanitation Company's MajiVoice Feedback System (Kenya)	22
Box 7. Participatory Budgeting in Porto Alegre, Brazil	23
Box 8. UNICEF's U-Report System (Uganda, Rwanda, Burundi, DRC, South Sudan, Nigeria, Mexico)	24
Box 9. Tanzania Living Labs	25
Box 10. Bluemap Environmental Data and Activism in China	27
Box 11. Participatory Mechanisms to Complement CivicTech in Nigeria	46
Box 12. Online Petitions System in Scotland	48
Box 13. Plain Language in Colombia, Peru and the United States of America	50
Box 14. Chatbots for Service Delivery Monitoring: CivicTech Pilot in Madagascar	52
Box 15. Murcia's Citizen App "TuMurcia" in Spain	54
Box 16. Addressing Local Issues Based on ICT and Citizen Engagement in the Republic of Korea	56



Acknowledgments

This how-to-note has been developed under the World Bank GovTech initiative by a team led by João Ricardo Vasconcelos and Youngseok Kim, both Senior Governance Specialists from the GovTech global team and Task Team leaders. The note is co-authored by Judy Backhouse, Senior Academic Fellow, and Antonio Tavares, Adjunct Professor, both from the United Nations University Operating Unit on Policy-Driven Electronic Governance (UNU-EGOV). Additional contributors include Kimberly D. Johns (GovTech Global Lead), Tiago Peixoto (Senior Governance Specialist), Craig Hammer (Program Manager) and Saki Kumagai (Governance Specialist). Overall guidance for the report was provided by Arturo Herrera Gutierrez (Director, Governance Global Practice), and Tracey Lane (Practice Manager). Editorial services were provided by Richard Crabbe.

The World Bank GovTech team would like to highlight the relevance of having an analytical deliverable co-developed with the UNU-EGOV. In line with the multistakeholder thinking of the GovTech Global Partnership, the engagement of this relevant partner added experience, quality insights and strategic outreach to the work developed.

This report was made possible by the World Bank's GovTech Initiative and the GovTech Global Partnership trust fund, building on support of financial and in-kind partners that include the Ministry of Finance of Austria, the State Secretariat for Economic Affairs (SECO) of Switzerland, the Ministry of Economy and Finance (MOEF) of the Republic of Korea, the Ministry of Economic Development of the Russian Federation, the Ministry of Interior and Safety (MOIS) of the Republic of Korea, the Government of Japan and the Federal Ministry for Economic Cooperation and Development (BMZ) of Germany.



Abbreviations and Acronyms

COVID-19	Coronavirus disease 2019
FAQ	Frequently Asked Questions
GTMI	GovTech Maturity Index
ICT	Information and communications technology
IDA	International Development Association
ITU	International Telecommunications Union
NGO	nongovernmental organization
OECD	Organisation for Economic Co-operation and Development
RFI	Request for Information
RFP	Request for Proposals
SaaS	Software as a service



Executive Summary

As economies and societies become increasingly digital, governments around the World are prioritizing the use of digital technologies and data to increase the participation and engagement of civil society in public matters. At the same time, citizen's rising expectations and demands require public sectors to strengthen civil society engagement. Digital technologies and data have the potential to increase substantially the tools that governments have available to further involve citizens in policy and service design and delivery.

This how-to-note provides advice on how to use digitalization to strengthen the engagement between the governments and citizens, with various examples of what CivicTech is and why it is an important element of the GovTech approach.

Why CivicTech Matters

In order to secure sustained development progress, governance must be accountable and responsive to the different groups of society. Based on the social accountability initiatives supported by the World Bank, CivicTech can build on these efforts expanding beyond accountability and providing particular relevance to dimensions such as engagement and collaboration. Also, civic engagement mechanisms with digital solutions can provide opportunities to generate more equitable national development.

Citizen engagement is one of the four focus areas of the World Bank GovTech initiative. As GovTech connects the state-citizen interface with government systems, processes, and services, CivicTech is positioned as one of the built-in features for citizen-centric service delivery. This boosts the potential for improving government responsiveness, which is a critical element for more open, transparent, inclusive and collaborative public governance.

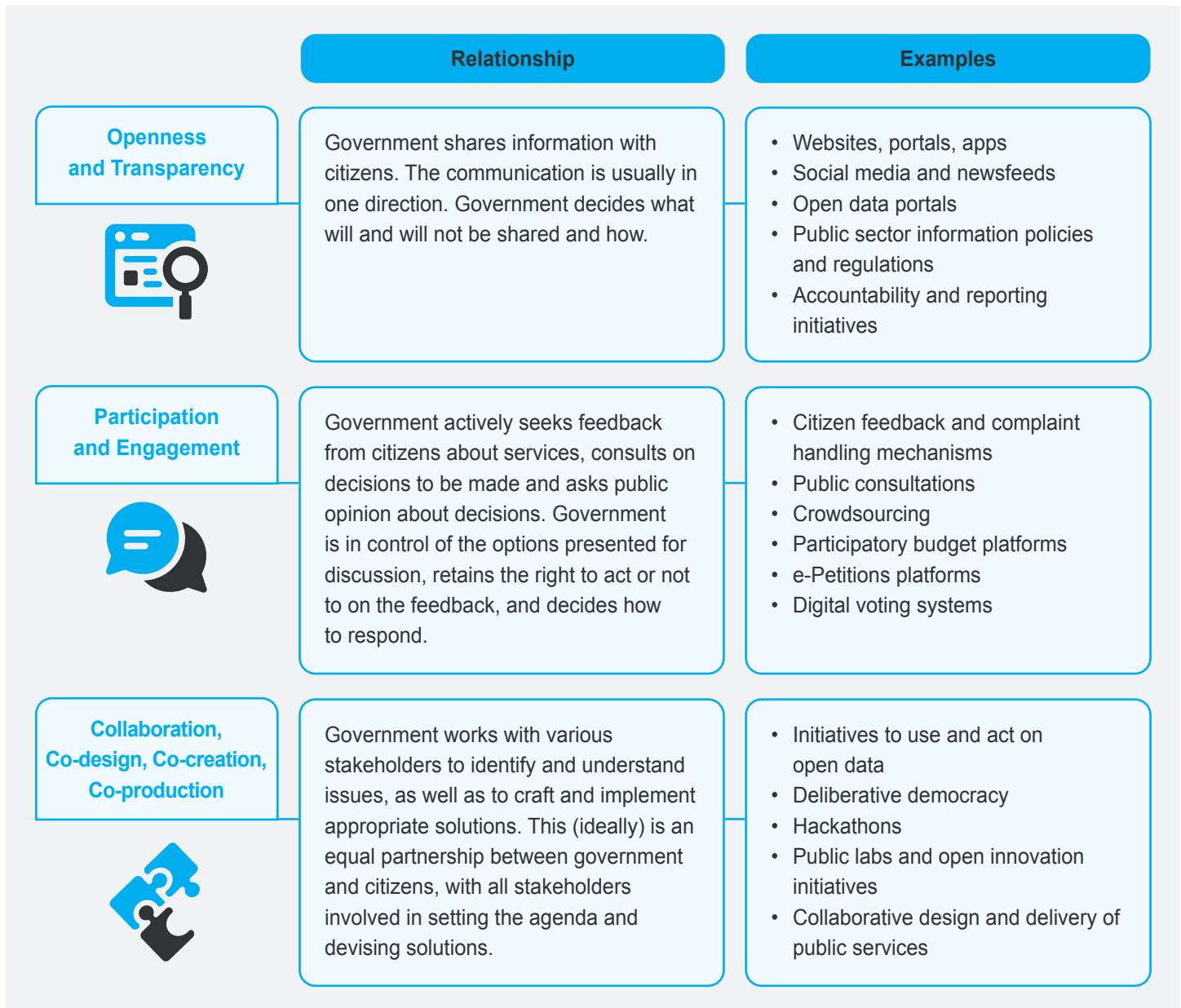
What Is CivicTech For?

The definition and framework of CivicTech have been discussed widely and diversely by different stakeholders, connecting key concepts of technology, innovation and engagement. This note identifies CivicTech as any innovation in the use of digital technology to improve governance and the interactions between government and citizens.

CivicTech activities can be categorized into three levels in terms of the nature of the engagement between government and citizens.

> > >

FIGURE ES.1 - Three Levels of CivicTech



CivicTech offers governments at various levels new ways of informing citizens, getting feedback from citizens and engaging closely with citizens. Technology has the potential to make it easier to reach more people and to provide a wide range of information and digital services at low cost.

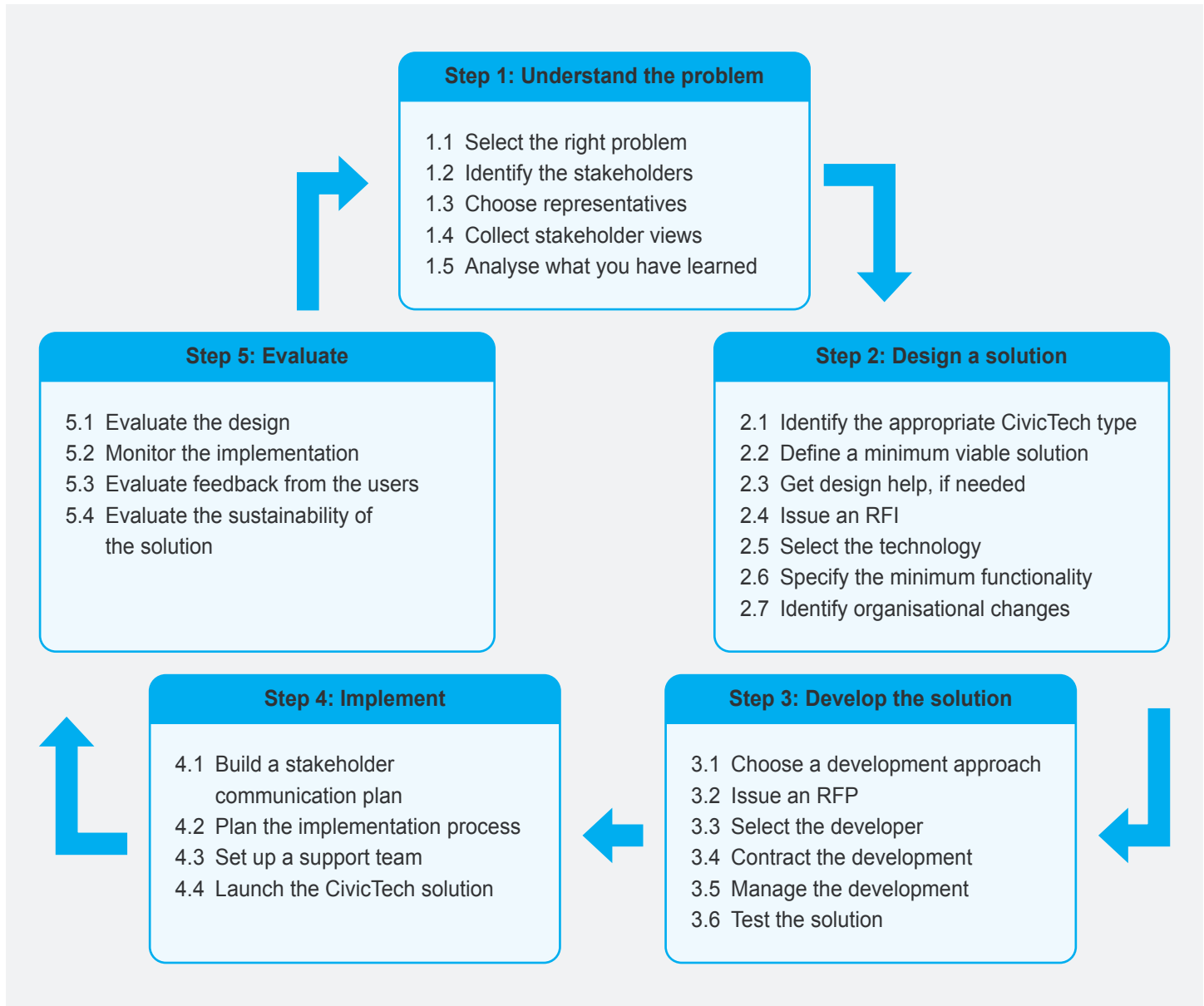
How to Adopt, Implement, and Assess CivicTech

To go from a CivicTech idea to a fully functioning CivicTech solution is a complex process that can be divided into five phases: understand the problem, design, development, implementation and evaluation. These phases are likely to

be iterated several times, depending on the complexity of the problem, before arriving at an acceptable solution. The CivicTech solution cycle is represented in Figure ES.2 below.

> > >

FIGURE ES.2 - The CivicTech Solution Cycle



The process emphasizes the need for deep understanding of the problem to be solved, as well as an iterative approach that allows for low initial investment, early visible results, rapid feedback on the impacts of the system, and immediate adjustments. Key points of each step are:

1. It is worth investing time to fully understand each problem, from the perspective of different stakeholders, including what solutions have been tried in the past and why they failed. Develop a theory as to why the problem situation has arisen and how your intervention will change it.
2. Solutions are systemic and technology is only a small part. Give appropriate attention to everything other than the technology – the communication, policy frameworks, the operational processes, the support mechanisms and the measurement and reporting.
3. Look for optimal technology solutions that reuse or build on existing technology but take advice from trusted technology partners on the capabilities and effort involved.

4. When implementing, start with small changes and observe whether your theory is correct and whether there are any unintended consequences before investing more resources.
5. Examine the outcomes and decide on the next incremental.

Key Issues for Successful CivicTech

Considering the diversity of contexts and goals, tools available and possible models to embrace, policy makers and task teams face several key issues when designing, developing and operating CivicTech approaches. Four categories can be considered having in mind the diversity of questions that can emerge.

> > >

TABLE ES.1 - Key Issues for Successful CivicTech

Category	Key issues
Citizens	<ul style="list-style-type: none"> • How to ensure the representativeness of participants and an inclusive CivicTech approach. • How to manage conflicting positions among citizens. • How to manage citizens' expectations.
Government	<ul style="list-style-type: none"> • How CivicTech changes communication between the government and citizens. • How to increase the responsiveness of government through CivicTech approaches. • How to assess the effectiveness of CivicTech.
Technology	<ul style="list-style-type: none"> • Which technology infrastructure enables inclusiveness? • Which type of technological approach is appropriate and how to adopt scalable and cost-effective CivicTech tools? • Building, buying, renting, or repurposing CivicTech solutions.
Foundations	<ul style="list-style-type: none"> • What are the building blocks for successful CivicTech implementation? • How to set fundamentals and building blocks to adopt and implement sustainable CivicTech effectively. • How to motivate citizens' participation.

CivicTech is more likely to succeed if attention is paid to the following key issues:

1. Work to ensure that interventions are inclusive, that conflicting positions are negotiated, and that citizens' expectations are managed.
2. Expect the relationship between citizens and government to change, ensure government is responsive transparent, and publish measures of the impact of interventions.
3. Aim for solutions that are simple, open, mobile, inclusive, and reusable, looking for optimal technology solutions that repurpose or build on existing solutions.
4. Develop foundational policies, infrastructure and skills where necessary, taking a whole-of-government perspective and building community engagement.



>>> Introduction

This how-to-note was developed to provide advice to World Bank staff and clients on how to use technology to strengthen the engagement between the State and non-state actors – citizens, civil society organizations, and the private sector.

As economies and societies become increasingly digital, governments around the world are responding to citizens' demands and prioritizing the use of digital technologies and data to improve public sector operations and services. This note discusses on the use of digital technologies and data to increase the participation and engagement of civil society in public matters. Different policy drivers, such as improving government efficiency and realizing fiscal savings, reinforcing policy effectiveness, reaching citizens with online services especially in the COVID-era of social distancing, boosting public sector innovation, and strengthening resilience of government operations, are pushing this digital transformation of public sectors. The process also enables “government as a platform” approaches and cultivating the relationship with the private sector. The focus on CivicTech is driven when there is a government desire to engage with citizens and to better tailor policy and services to their needs, in order to build trust with citizens, and to realize gains such as more developed and peaceful societies. In a context where citizens in developed and emerging markets are getting more and more used to sophisticated private sector services from providers such as Google, Amazon, and Uber for instance, citizen's expectations of the quality of services from the public sector are also skyrocketing. Citizens therefore expect governments to be increasingly efficient, responsive, seamless, transparent, and easy to interact with.

At the same time, if public sectors are unable to respond to demands from citizens, this can be detrimental to the trust that governments and civil society require to strengthen citizen engagement in the public sector. Digital technologies and the data that they create have the potential to substantially increase the tools that governments have available to further involve citizens in policy and service design and delivery. Citizen feedback and complaint handling mechanisms, public consultations, participatory budgets, crowdsourcing platforms, hackathons, and collaborative design approaches are some of the processes that are increasingly using digital tools applied in different sectors and levels of government. The potential to use these tools is there, but how can governments benefit from this engagement opportunity, securing it in an inclusive, efficient, and sustainable way, deliver on citizen expectations, and build trust?

The World Bank describes the GovTech approach as the current frontier of government digital transformation, emphasizing the need for the public sector to prioritize citizen-centric public services that are universally accessible, a whole-of-government approach capable of mobilizing different sectors and levels of government, as well as simple, efficient, and transparent government systems. In line with its multistakeholder thinking, the World Bank GovTech initiative embraces citizen engagement as one of four pillars of GovTech. Developing and deploying CivicTech tools is considered a priority in digitally developed and developing contexts, through the use of simple and open-source applications, to advance governments' efforts for achieving greater transparency, citizen's trust, and policy sustainability (WBG 2020).

This how-to-note provides examples of how CivicTech can be used to impact governance, and how technologies and systems that facilitate the relationships between government and the other stakeholders can change governance

outcomes.¹ With the proliferation of information and communication technologies, new possibilities have arisen for citizens – the people who live, work, visit, and do business in the relevant jurisdiction – to be better informed about matters of governance, to voice their opinions more effectively and, in some cases, to get involved in the design and delivery of public services. New technologies have also revealed the ways in which governance is the result of negotiations, influences, and power relationships between government and citizens, increasing awareness that many stakeholders have a role to play in governance as well as empowering them to participate.

The concept of CivicTech responds to the expectations of civil, private, nongovernmental, and academic stakeholders to participate in the public space and the evidence-based consensus about the benefits of engagement and collaboration with non-state actors for cohesive and sustainable policy approaches. Building on concepts such as social accountability² and citizen engagement,³ CivicTech is a fundamental pillar of a sound GovTech approach, where citizen engagement is emphasized as a critical mechanism to increase government's digital agenda focused on citizen's welfare, improving shared ownership and joint responsibility towards the policies and services being developed.

The increasing use of digital technologies and data in the last few decades has enabled civil society to better participate in public affairs, generating good lessons learned on what can be achieved and where initiatives can be improved. While the adoption of CivicTech in developing countries is currently slower than in digital leader countries, according to the GovTech Maturity Index (see Box 1), CivicTech tools may provide new opportunities for the state to engage with citizens to build trust and tailor policy and services more effectively to local needs within the fiscal constraints.

> > >

BOX 1 - GovTech Dataset on How to Manage Citizens' Expectations

GovTech Dataset (2020) shows how 198 economies are managing citizen's feedback and expectations through identifying key questions, such as whether citizen's feedback is anonymous, and governments' response is publicly available on the platform or not. Many countries still need to develop the way of managing citizens' feedback since only 35 economies publish their responses on the platform and 26 countries publish their engagement statistics and performance regularly.

I-25. Is there a national platform that allows citizens to participate in policy decision-making?

- 82 countries have; the remaining 116 countries do not have.

I-27. If Yes, Are citizens' inputs publicly available on the platform?

- 56 countries out of 82 publish citizens' input on the platform.

I-28. If Yes, Does the platform allow citizens to provide feedback anonymously?

- 30 countries out of 82 allow citizens to provide feedback anonymously.

I-29. If Yes, Is government response publicly available on the platform?

- 35 countries out of 82 publish their response on the platform.

I-30. Are there government platforms such as a website or app that allow citizens or businesses to provide feedback – compliments, complaints, suggestions, information requests – directly to the government on its service delivery and performance?

- 75 countries report “Yes,” and 123 countries, “No.”

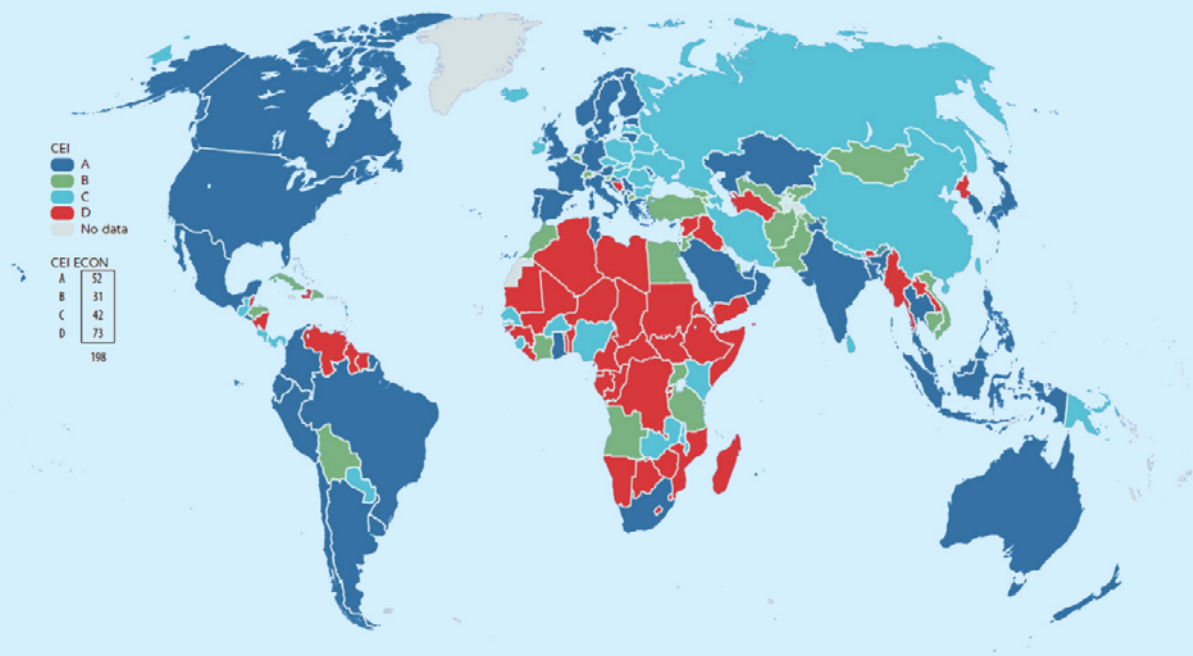
I-33. Does the government publish its engagement statistics and performance regularly?

- 26 countries “Yes;” 172 countries, “No”

The map below (Figure 1) reflects the Citizen Engagement Index (CEI) that is one of the four components of the GovTech Maturity Index (GTMI) (Dener et al. 2021).⁴

> > >

FIGURE 1 - State of Citizen Engagement, by GTMI Group, as of December 2020



Source: World Bank Data (2020).

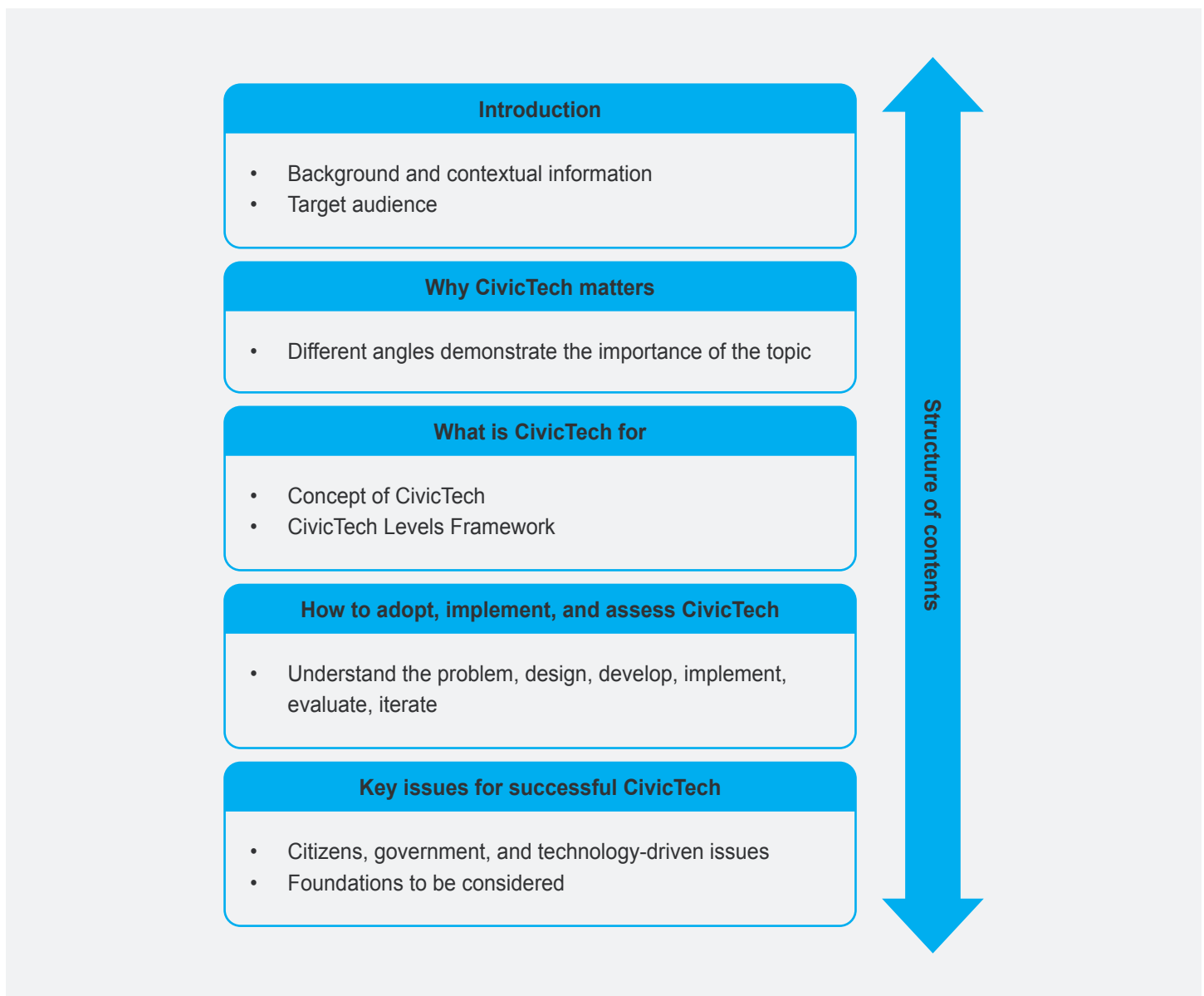
The target audiences of this note are the senior GovTech officials of more digitally developed and developing countries and the community of Task Teams Leaders managing public governance projects in different regions. The note should also serve as an important knowledge piece to secondary target audiences—the broader ecosystem of GovTech stakeholders including the private sector, academia and civil society.

This how-to-note will provide examples of what we mean by CivicTech and why it is an important element of the GovTech approach. As presented below in Figure 2, the note will discuss in Chapter 2 why CivicTech matters, providing the reader with contextual information on the importance attributed by the World Bank to this topic, as well as the benefits that drive its adoption

by public sectors in different regions. Chapter 3 will focus on what CivicTech is, presenting and analyzing critical CivicTech focus areas and activities, and providing the reader with a conceptual framework to navigate the numerous and diverse practices and approaches that governments around the world are embracing to promote citizen engagement through digital technologies and data. With a clear implementation-driven function, Chapter 4 will guide World Bank partner- and client countries on how to adopt, implement, and assess CivicTech. Chapter 5 will highlight key issues that policy makers face when designing, developing, and operating CivicTech approaches. The Conclusion will provide the reader with key factors for a sound CivicTech policy. The Annex provides details of 24 CivicTech solutions from 20 different country contexts.

> > >

FIGURE 2 - CivicTech How-to-Note: Structure of Contents



Source: Authors.



Developing CivicTech solutions is complex and varies greatly depending on context, the nature of the problem to be solved, and the people involved in the solution. This how-to-note is intended to assist those venturing into CivicTech developments by exposing what has been done, highlighting the key issues and providing some tools that may assist in

the process. Each project will need to select from this note the elements that they find of value and experiment and modify them in application. If this note facilitates improving the success rate of such projects, it will enhance the relationship between governments and their citizens, contribute to better governance, and develop more harmonious societies.



Why CivicTech Matters

CivicTech matters because the relationship between state and non-state actors matters for national development. In order to secure sustained progress in development, governance is required to be accountable and responsive to the different groups in society. And although all societies are diverse and power is distributed unequally, governments should guarantee that development dividends can still be equitably disseminated and actually reach the bottom half of the population. Civil society has a fundamental role in supporting governments to be more transparent, accountable, and effective. Citizen advocacy towards public institutions acts as a critical mechanism for better public governance, contributing also to the emergence of innovative solutions to tackle complex challenges. Increasing evidence demonstrates that citizen engagement leads governments to more solid development results by catalyzing improvements in public service delivery, public financial management, governance, social inclusion, and empowerment.⁵

While individual citizens may have limited capacity to influence the political agenda and the broader public sphere, civic engagement mechanisms provide opportunities to generate more equitable development. Modes of citizen engagement can include elections, political organization, social movements, and direct participation and deliberation. And since each one of them is incomplete, these mechanisms complement rather than substitute each other (WBG 2017). CivicTech can contribute to this process of citizen engagement changing the relationship between state and non-state actors, broadening the number of stakeholders involved, and strengthening policy making and service delivery outcomes for the least privileged segments of the population.

The World Bank has supported the development of social accountability⁶ policies and initiatives for several years. CivicTech builds on these efforts, expanding beyond accountability and providing particular relevance to dimensions such as engagement and co-development. The Social Accountability approach is based on civic engagement for improved accountability.⁷ This approach promotes the direct or indirect participation of citizens and/or civil society organizations to demand accountability. The digital transition underway allows new levels of interaction and collaboration between governments and their constituents – see Chapter 3. Going beyond accountability, the CivicTech paradigm enhances digitalization opportunities of partnering and co-development for better public governance.

In 2014, the World Bank Group (WBG) developed its Strategic Framework for Mainstreaming Citizen Engagement to more systematically foresee and incentivize citizen engagement in WBG-supported operations. The framework defines citizen engagement as the two-way interaction between citizens and governments or the private sector within the scope of WBG interventions. The approach is results focused engagement through the operational cycle, seeks to strengthen country systems, context specific, and gradual. This citizen engagement approach gives citizens a stake in decision-making in order to improve intermediate and final development outcomes.⁸

Citizen engagement is one of the four focus areas of the World Bank's GovTech work. It foresees the development and deployment of CivicTech tools including citizen feedback and complaint handling mechanisms, using simple technology and free open source applications, as well as use of technology to advance government's efforts at greater transparency.⁹ As GovTech connects the state-citizen interface with the government systems, processes, and services, CivicTech is positioned as one of the built-in features for citizen centric service delivery, beyond the frequent nice-to-have feature approach. This boosts a potential for improving government responsiveness, which is a critical element for more open, transparent, inclusive, and collaborative public governance.

Recognizing the importance of stakeholder engagement for development is one of the priorities of the World Bank Environmental and Social Framework (ESF), which governs the World Bank's approach to all operations. The ESF provides guidance on stakeholder engagement, instructing borrowers to engage and actively provide information to stakeholders throughout the lifecycle of a World Bank-financed project (WBG 2022). This is therefore a critical entry point for technology to be brought in to facilitate the effectiveness of this process.

Citizen engagement also receives particular relevance within projects financed by the International Development Association (IDA). Improving the interactions between government and nongovernment actors strengthens the policy process. Multistakeholder approaches support inclusive and sustainable governance through collaboration, deeper citizen engagement, and social accountability. (WB 2019) In this regard, all IDA investment operations are required to be informed by consultations with civil society. IDA recognizes the important role of GovTech for strengthening government-citizen interaction and considers inclusive governance a priority to be achieved by further sharpening the focus on citizen engagement (IDA 2022).

In line with the World Bank GovTech Initiative's philosophy and framework, the World Bank GovTech Maturity Index (GTMI) has a specific subindex on Citizen Engagement. The subindex is based on 12 indicators providing empirical data on the experiences of 198 economies in terms of citizen participation and feedback, along with government responsiveness and accountability. It assesses elements such as the existence of an open data portal and whether or not it is functioning, the availability and approach to an open government portal, and the existence of platforms that allow citizens or businesses to provide feedback. Prioritizing collaboration and reuse of government-held information, the subindex also uses the UN e-Participation Index as an indicator for the use of online services in providing information to citizens (e-information sharing), interacting with stakeholders (e-consultation), and making decisions (e-decision-making).

The policy benefits of CivicTech approaches have been widely discussed over the last decades.¹⁰ The space and time contraction brought by digital technologies allows governments to consult and engage citizens in a more cost-effective way. While face-to-face mechanisms may need to be preserved, digital options can provide additional and often efficient mechanisms for government to provide information and services to their constituents, and to engage them in the thinking, planning, designing, developing, and monitoring of public services and policies. Feedback mechanisms can be directed to citizens and stakeholders on specific policies or services using technology that often requires much lower marginal costs. For example, sentiment analysis of the population can be done through phone surveys, online consultation, and data analytics of social media. Although there is still a lot of room for improvement, CivicTech tools have the potential to make it easier for governments to reach out to citizens, obtain their feedback, and engage and collaborate with them.

The use of digital technologies and data for citizen engagement can bring citizens, private sector, academia, and NGOs together in new ways potentially enhancing the impact of stakeholder engagement. This goal is aligned with the World Development Report (2017) in advocating the strengthening of government commitment to enable effective GovTech and data-driven service delivery, particularly in low- and middle-income countries. CivicTech can also help to bring about credible government commitment, moving beyond sufficient political will and resource allocation, to include the active cooperation and coordination across institutional arrangements necessary to achieve better outcomes. Moreover, by facilitating the relationship between state and non-state actors, CivicTech contributes to enhance trust, participation, and value-creation for governance outcomes. This is closely aligned with the 2021 World Development Report's central point that a social contract for data and information exists between government and the public, which is conditioned by a three-pillar framework of trust, equity, and value. A key benefit of CivicTech is its contribution through civic engagement and transparency to improve citizens' trust in public institutions. The lack of trust in government is one of the most critical political handicaps that countries face, undermining the functioning of political systems. Unfortunately, the information age is contributing to this phenomenon through endemic trends such as widespread disinformation and increasing social polarization generated by social media. It is also worth mentioning that the positive relationship between trust and transparency is, however, not supported by some literature, with some experimental evidence suggesting that transparency may even reduce trust in government.¹¹

CivicTech approaches can nonetheless counter these trends, better engaging citizens in public policies, generating co-ownership as well as joint responsibility, and diminishing the wide space that frequently separates citizens from public institutions. The Organisation for Economic Co-operation and Development (OECD) underlines the existence of competence and values as two key drivers of trust: services that respond to citizens' needs generate trust in government competence; integrity, openness and exercise of power in the public interest generate trust in government values. For instance, instruments such as participatory budgets allow an active engagement of citizens that can generate trust.

Beyond the benefits highlighted above, CivicTech also brings limitations and risks. Since citizen engagement is supported by digital technologies, concerns regarding the digital divide can be highlighted. CivicTech can exacerbate existing disparities, potentiating further exclusion by age, gender, level of education and literacy, income level, connectivity, access to technology, tech literacy, geographical locations, and disabilities. Hybrid approaches are therefore recommended, combining tech and non-citizen-state interfaces, as well as balancing the use of basic technological solutions and more advanced and recent technological approaches. Additionally, it should be noted that CivicTech tools can have limitations to capture actionable feedback, and can easily work as an "echo chamber" of established economic, social, and political positions rather than contributing to open and plural public debates. An inclusive, open and accountable design and development is required to mitigate any identified limitations and risks.^{12,13}



The World Development Report 2016 (WDR16) also underlines that the ability of digital technologies to increase citizens' voice is conditional on several contextual factors. For instance, the willingness and ability of policy makers is critical. A collaborative approach with government has a substantial weight, and significant offline activism supported by civil society organizations is also determinant to secure that the collective voice of citizens can be heard by governments. Additionally, WDR16 also underlines that digital platforms can support unaccountable governments' capacity for surveillance and control. Autocratic governments frequently respond to the digital transition improving service delivery, but simultaneously strengthen political control over their societies.¹⁴ In this sense, the CivicTech approach should not be understood as a simple and democratic solution for civic engagement problems, but rather as a mechanism that supports downward accountability by enabling the collective action needed to give citizen voice some strength.¹⁵

The World Bank has been supporting the use of digital technologies to further engage citizens in the public sphere through the creation of feedback mechanisms that allow citizens to evaluate the services being delivered; the development of open data portals that contribute to improved transparency and value co-creation; and the simple launch of public portals that secure further services and policy information to citizens. CivicTech is not, in this sense, a new workstream since some of its rationale has been embedded in e-government, digital government and GovTech projects for a

long time. But more recently the thinking of engaging citizens is increasingly mainstreamed, as civil society's expectations have increased regarding participation, quality services and accountability.

Nevertheless, the results of GTMI 2021 underline that there is still considerable room for improvement in the citizen engagement dimension. Although good practices can be identified in different sectors and levels of government in countries from different regions and various levels of digital development, CivicTech is still not typically embedded-by-default in policy making or service design and delivery, being mostly presented as an add-on on top of foreseen policies and projects. On the other hand, the COVID-19 pandemic accelerated the necessity of digital communication and collaboration between governments and citizens, leading to increasing expectations for citizen engagement approaches through digital technologies. CivicTech gained a new relevance and governments are currently expected to reinforce their efforts to respond to this increasing demand from their constituencies.

Building on the existing knowledge and work of the World Bank and the United Nations University, this comprehensive how-to-note on CivicTech provides concrete and analytical knowledge and insights, responding to the demands from senior digital government officials and GovTech practitioners from partner and client countries.



3

What Is CivicTech For?

3.1 Introduction

This section expands more fully on what CivicTech does. It explores the various ends to which CivicTech has been directed and discusses the potential as well as the successes and failures of CivicTech initiatives. But first, there is the need to clarify what the term CivicTech refers to here. There is currently no agreed, cohesive definition of civic technologies, and differences exist in those used by practitioners and the academic community (Mačiulienė and Skaržauskienė 2020). The focus of definitions varied depending on the stakeholder, but reflect the key concepts of technology, innovation and engagement.

CivicTech has been described in terms of activism, as “free and openly available technologies and engagement means” for “more direct governance engagement” (Wissenbach 2020). Hou (2018) reserves the term CivicTech for products which enhance democratic capacity, excluding e-government which improves government services, but Rumbul (2015) counts as CivicTech all digital tools that increase government transparency, efficiency, and improve the lives of communities. Some researchers see social change as a necessary outcome of CivicTech (Mačiulienė and Skaržauskienė 2020). More broadly, the Microsoft Corporation defines CivicTech as “the use of technology for the public good” (Stempeck 2016), and the private sector focuses on helping governments to improve service provision (Clarke 2014). Civil society, NGOs, and practitioners define CivicTech in terms of the changes in power balance (Code for America 2017; MySociety 2017).

Given the target audience, and in the absence of any agreed definition, this note treats CivicTech as any innovation in the use of digital technology to improve governance and the interactions between government and citizens.

3.2 A Framework for CivicTech

Different frameworks have been developed to understand the range of CivicTech projects and interventions. For example, Sifry (2014) characterizes CivicTech as systems which (1) involve citizens in policy processes; (2) involve beneficiaries in monitoring service delivery; (3) use structured information to inform decisions; (4) leverage technology; (5) make information more accessible, public and understandable; (6) empower people to hold government accountable; and (7) democratize elite processes. Verhulst (2015) categorizes CivicTech as related to responsive and efficient city services; open government data and portals; government engagement platforms; community-focused organizing services; and geographical services and open mapping data. Dietrich (2015) identifies three types of CivicTech, which together facilitate (1) transparency and accountability; (2) citizen-government interaction; and (3) easier everyday life. At present, no one framework is widely accepted and used.

These frameworks categorize CivicTech interventions based on their function, what they do. This focus is limiting since new applications of CivicTech are highly likely to emerge. In addition, listing the types or function of CivicTech does not provide a way to analyze their deeper characteristics. Research into information systems and e-government systems, as well as media studies, analyzes systems in terms of the flows of information (and hence power) between

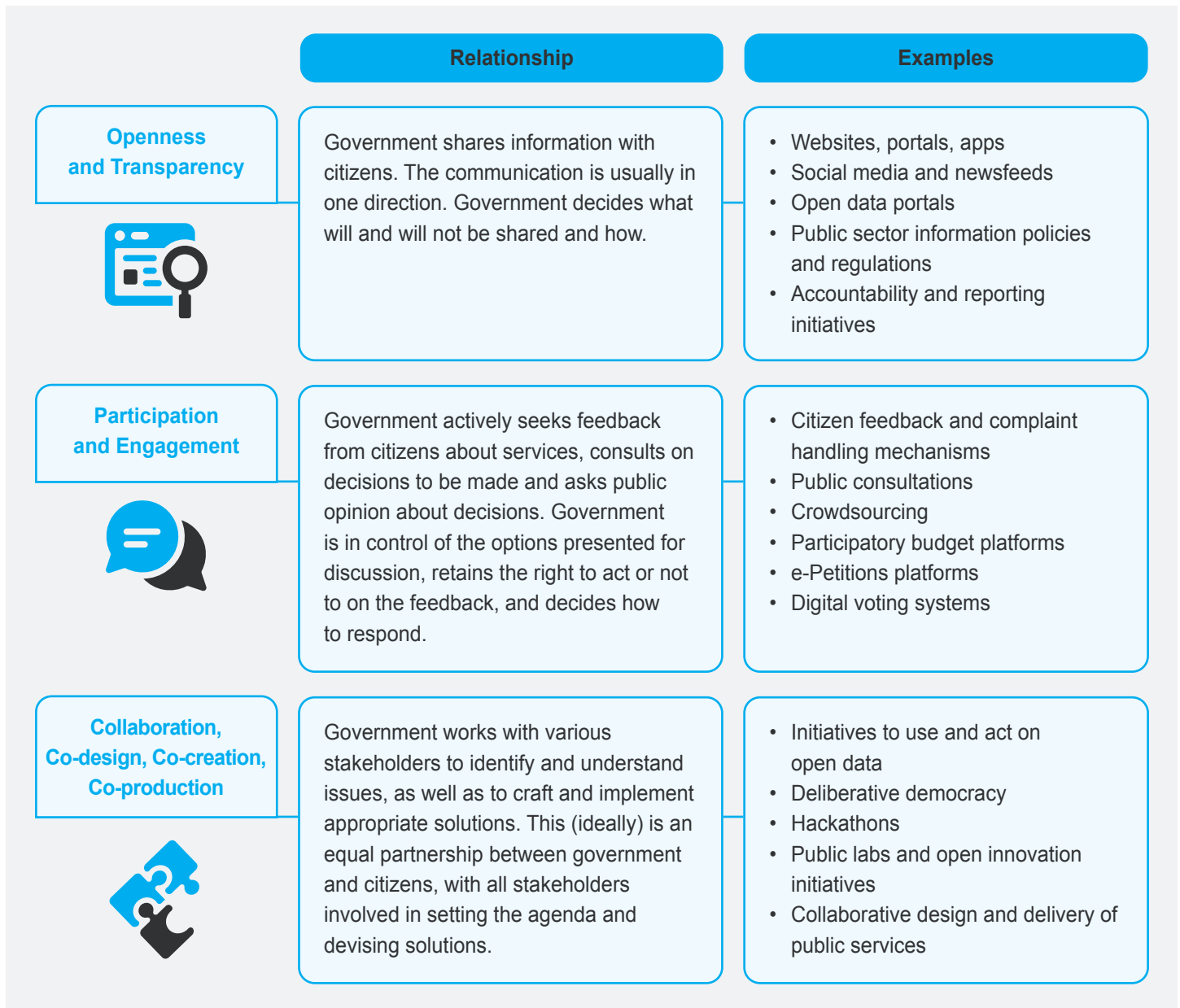
different stakeholders (Baum and DiMaio 2001; Fath-Allah et al. 2014). The discussion in this chapter is framed in terms of the information flows and roles of stakeholders in CivicTech engagement in order to not limit the function of CivicTech projects and to make visible the roles of stakeholders and power relations.

CivicTech activities can be categorized in terms of the nature of the engagement between government and citizens.¹⁶ The table below summarizes the three levels of CivicTech, which are discussed in detail in subsequent sections. The examples given in the table are not intended to be an exhaustive list of CivicTech options, but rather as illustrative examples of the interventions that might be categorized under each. Also, there is overlap between the levels because the same technology may be implemented at different levels. So, different technologies are not specific to one level or another, but rather the way in which the implementation enables and facilitates the flows of information determines whether a solution is considered to be at a particular level.

The Annex at the end of this guidebook provides a list of different CivicTech projects covered in each of the three levels. This list could be useful for understanding the types of projects and technologies and how they can be used.



FIGURE 3 - Three Levels of CivicTech



CivicTech solutions can be initiated by governments, in response to demand, to improve communication with citizens, to improve efficiency of internal operations (Botchway et al. 2016), or in response to legislation that supports transparency (Sun and Yan, 2020). They can also be initiated by businesses in the private sector for profit, by national or provincial

government structures to enforce transparency, or by NGOs to provoke debate or address issues. In some cases, indices of transparency developed by researchers or activists pressurize local governments to share information more effectively (da Cruz et al. 2016; Gandía et al. 2016; Sun and Yan 2020).

3.3 Openness and Transparency

CivicTech is premised on the idea that well-informed citizens are better able to participate in civic processes and take control of their lives. With quality information, citizens can enhance their lives by, for example, accessing services to improve their health, education, retirement, or living conditions. Informed citizens can also make better choices – for example when voting, better understand their role in governance, hold governments to account, build more reasonable expectations of government, and contribute constructively to building a good society, however that might be defined by different stakeholders. Thus, enabling the provision of and access to information is an important task of government, which can be facilitated by CivicTech.

The information that government agencies can share includes:

- News about local or national plans and local or national services.
- Information about policies and relevant legislation or regulations.
- Information about the right to information and the processes of claiming those rights.
- Information about the processes of governance and how citizens can engage with them.
- Information about government services and programs, eligibility and how to access them.
- Information about the progress of individual service applications.
- Operational data that gives insights into the functioning of a city, district, or country.

For citizens to be well-informed, they need to access the information. Access, is a multifaceted construct that includes being aware of the information sources and being able to obtain, interpret, and act on information. Information services need to be advertised so that citizens are aware of their existence. When information is provided digitally, access includes owning or having the use of a digital device, knowing how to use it, feeling safe when using it, having both the financial means and the technical know-how to connect a device to a network, being able to download and use software, knowing where

to look for relevant, timely, and accurate information, and correctly interpreting the information provided in order to act on it (Backhouse and Chauke 2020; Mojapelo 2020). Since there are many points of failure in this chain, technology can be both a barrier to and a facilitator of access. Consequently, information sharing necessitates advertising and often also requires the provision of access tools, training, and financial support for technology access.

Common tools for sharing information include central and local transparency portals, open data platforms, city websites, ministry or agency websites, newsfeeds, social media, mobile apps, and text messages or Unstructured Supplementary Service Data (USSD) menus for cellphones that are not smart. For example, in Bangladesh, the national government has provided a website that indexes all government-related websites (<https://bangladesh.gov.bd/index.php>). This overarching site is intended to make it simpler for people to locate the appropriate government website. In Egypt, a State Information Facebook page is used to share information widely (<https://www.facebook.com/EgyptStateInformation>). In Mozambique, PENSA (Plataforma Educativa de Informação sobre a Saúde), a low-tech mobile app, has been developed to provide healthcare information using USSD menus (<https://www.pensa.org.mz/>).

Information sharing is also facilitated by internal ICT systems that improve the responses citizens get when they contact government agencies. These include query tracking systems, scripted responses, and call centers with tools that monitor the quality of engagements and track response times. Information about city processes can help to manage citizen expectations, and tracking systems where residents can follow the progress of their service requests can reduce the number of calls to the city (Backhouse and Ben Dhaou 2021). Call centers can be effective if they are integrated with operational systems so that agents can trace and resolve problems, rather than just logging them (Paul 2019). Box 2 below provides an example of how smaller municipalities in Spain use their operational systems to share information. It is an inexpensive model that is easy to replicate.

> > >

BOX 2 - Digital City Services in Ronda, Spain

Ronda is a small city in Spain with fewer than 36,000 people, making it difficult to justify investments in complex digital solutions. The city runs Gestiona, a cloud-based Electronic Document and Record Management System (EDRMS), which allows city procedures to be defined and carried out digitally. The solution includes a website with separate sections for employees and the public. The solution is provided in Software as a Service (SaaS) mode so that the city has not had to invest in computer infrastructure or acquire the technical skills to run it.

The website for the public (<https://ronda.sedelectronica.es/info.0>) includes announcements and a catalogue of city procedures that provides information about which regulations govern that procedure and how the citizen can initiate it. Most of the procedures can be carried out electronically. There is also a section titled “electronic folders” where citizens can check the status of any request that they have submitted. Since implementing the solution, Ronda city has reduced face-to-face interactions at offices, as well as traffic at the Town Hall, by almost half, as residents can access the information they need to initiate processes and follow up on requests independently. Processing times and the use of paper by the city have also been reduced (Backhouse and Ben Dhaou 2021).

Open data platforms are another means to share information with citizens. Such platforms provide data sets, metadata about the data sets and, sometimes, visualization tools and explanatory materials to enable citizens to understand the data. Data sets can be drawn from operational systems such as maintenance or billing systems, national or sub-national records such as a land registry or crime records, or from research conducted by the city, including household surveys and census data. In each case, the data to be shared needs to be accurate, clean and complete, and aggregated

to address privacy concerns. Unless regulations specify, the national or subnational governments control the choice of data to be shared, but need to align provision to the areas of city governance that are most important to citizens, if the data is to be used and analyzed by citizens, academics, NGOs, or other third parties. Arguably the more granular and local the data, the more useful it is for citizens and the more it can lead to participatory approaches as described in the next section.¹⁷ Box 3 below provides an example of open data from Kenya.



> > >

BOX 3 - Kenya Open Data

The Kenya Data Portal is a project of the Kenya National Bureau of Statistics, sponsored by the African Development Bank that brings together over 40 data sets from 18 sources to provide information about Kenya, Africa and the World. The data is organized in a number of ways, including by topics such as health, education, demographics and agriculture. Graphs and dashboards on key topics provide visual representations of the data. Users are invited to register to use the data portal. The portal can be accessed at <https://kenya.opendataforafrica.org>.

In order to be able to share such information, governments may need to first establish legislation and policies to be able to disseminate and communicate government-held information. There are many examples of governments embracing openness and transparency as ways to provide information and to build citizens' trust in the information as well as in government itself, with some passing legislation such as Right to Information or Access to Information that mandates the sharing of open data by government departments (EU 2019; Manda and Backhouse 2016; Sun and Yan 2019).¹⁸

In 2011, eight governments¹⁹ and nine civil society organizations²⁰ established the Open Government Partnership (OGP) as a multilateral initiative designed to elicit the commitment of national governments to promote transparency, empower citizens, enhance accountability, and combat corruption by taking advantage of new information and communication technologies. Since then, 76 countries have joined the OGP and several more are planning to do so in the upcoming years. Governments and civil society organizations can join the OGP if they agree with its principles, mission, and agenda. This includes the promotion of freedom of information about government activities, civic participation, professional integrity in public administration, and access to technology

for openness and accountability (OGP 2011). In order to join the OGP, partners must meet certain targets, but, since membership is purely voluntary, they can commit to these goals by following different national strategic action plans, as long as these conform to the OGP principles (Fraundorfer 2017). CivicTech tools fit the overall goals of the OGP and their importance has grown as a result of the COVID-19 crisis putting an emphasis on online civic engagement.

CivicTech that provides government information to citizens seeks to inform and improve transparency, in the hopes that accountability will follow. However, it is not necessarily the case that transparency results in accountability, nor to any improvement in services. (Peixoto and Sifry 2017). Nevertheless, journalists, bloggers, and civic-minded individuals can put additional pressure on governments to disclose information not yet contained on these platforms, and use this information to act as "armchair auditors" that participate in the policy process, promote accountability, improve the quality of government decision-making, and help to prevent and mitigate corruption (da Cruz et al. 2016). Box 4 below provides an example from South Africa where information about municipal finances is communicated to citizens.

> > >

BOX 4 - Municipal Spending in South Africa

In an effort to improve transparency and accountability, the South African treasury provides online information about municipal finances via two websites. Municipal Money (<https://municipalmoney.gov.za/>) is a site that provides performance ratings for each municipality in the country and explanations of the indicators used. Municipal Data (<https://municipaldata.treasury.gov.za/>) provides the source data for the performance ratings as downloadable data sets. Both sites include a video that explains in simple terms the different types of municipalities and the basics of their budgeting and financing as well as other resources.

These websites are one-way communication mechanisms, with the central government providing information to citizens. No avenues are provided for digital engagement, although traditional face-to-face engagement is encouraged in the videos. Citizens are encouraged to attend local government meetings and give input to budgets and Integrated Development Plans. The videos also suggest that people monitor the performance of their municipality and work with local civic organizations to hold municipalities accountable. To facilitate this, detailed contact information is provided, including the website, office address, telephone numbers, and email addresses of the mayor, deputy mayor, municipal manager, and chief financial officer.

3.4 Participation and Engagement

The second type of CivicTech is participation and engagement, which has the objective of seeking information from the citizen to the government and engaging in response to citizens. This includes requesting citizens to provide feedback on government services as well as input and opinions from citizens on their needs, frustrations, and proposed changes to public services. The agency seeking feedback or input controls the questions that are asked and the options put to the public, and thereby the extent to which citizens can provide feedback; it also controls the responsiveness of the agency to that feedback.

There are two aspects of participation and engagement initiatives: the uptake or extent to which citizens engage and provide feedback, and the response of governments to that participation (Peixoto and Sifry 2017). Uptake can

be influenced by advertising and effective communication about a service and how to use it. Civic engagement tools are also more likely to attract participants if they concern an issue that people care about and if people think that there will be a meaningful response (Asher et al. 2021). CivicTech increases the capacity of providers to respond because they collect individual responses and accurate data about citizen experiences, opinions, and preferences which policy makers and service providers can use to identify and address problems. However, they do not necessarily result in effective response, particularly when the system does not have a built-in incentive for responding. Perhaps the best example of effective feedback systems are the so-called 311 systems used in North America that are tied to the tracking and resolution of citizen requests – see Box 5 below for an explanation of 311 systems.

> > >

BOX 5 - 311 Systems in United States of America

Automated municipal service requests, also known as 311 systems, can improve service delivery to citizens. These systems began as telephone-based complaint hotlines and have evolved to become multichannel citizen relationship management systems, including call center, web, mobile app, and social media platform options (Hartmann 2019). The multi-channel approach reduces the digital divide by catering for preferences of different groups. This has allowed 311 services to evolve from client-oriented services delivered or produced by government to citizen coproduction systems through the submission of pictures, videos, and GPS coordinates (Chatfield and Reddick 2018).

In their case study of 311 services in Houston, Chatfield and Reddick (2018) found evidence of the effective localized use of big data analytics in some departments, but these practices were not widespread. Instead, they suggest that departments with a history of use of big data and big data analytics are more successful in promoting the “data-driven government” vision. The 311 system in the City of New York allows citizens to request assistance for homeless persons by anonymously sharing the location of the person. Boston’s system allows the detection of potholes via the Street Bump app. Both Boston and Philadelphia hold hackathons to elicit ideas to help improve their 311 systems (Hartman 2019). Li et al. (2020) found an association between certain 311 indicators, such as code violations, public health and street lighting complaints, and episodes involving opioid overdose events.

Currently, there are no professional or data standards in the implementation of 311 systems (Stowers 2021). Important recommendations for improving these systems include adopting standard service categories, developing performance benchmarks, and identifying and sharing best practices (Stowers 2021). In the case of mobile apps, design and usability guidelines should be adopted (de Paula et al. 2014). Additionally, citizen involvement is crucial for success. Many cities have adopted chat functions for communication between citizens and city workers and feedback – for example, photos – as processes are being solved. The latest developments in 311 systems include the automatic reporting of problems based on data from smart city applications (Huang et al. 2016). Smartphone alerts when entering dangerous areas, detection of potholes, noise, or urban infrastructure malfunctions are just a few examples of crowdsourced anomaly reporting in real-time (Hartman 2019; Huang et al. 2016).

311 systems have expanded to include social media networks but, here again, guidelines are still missing. A study of five American cities found that response to 311 requests via Twitter ranges from 50 percent in Chicago to 97 percent in San Francisco, indicating a high degree of variability in government responsiveness (Gao 2018).

The success of feedback systems depends on their uptake by citizens, which in turn depends on the perception among citizens that there will be a meaningful response to the feedback and no reprisals or repercussions for raising a complaint. Research shows that such responses depend partially on the design of the system—as in the 311 systems that track responses, but also to a large extent on the institutional design (Peixoto and Sifry 2017). Box 6 below presents a successful example of a feedback mechanism in Kenya. Systems that disclose the feedback received, in order to inform citizens, are more likely to lead to action. Such systems are, however, limited in what they allow citizens to contribute. The agenda is set by the government agency – what gets asked, how responses are categorized, how and if there is a response – and they decide if and how to respond.

> > >

BOX 6 - Nyeri Water and Sanitation Company's MajiVoice Feedback System (Kenya)

The Nyeri Water and Sanitation Company (an urban water agency in Nyeri, a town in Nyeri County, Kenya) provides an online service, MajiVoice, for registering and tracking complaints, problems, and questions about their services. The service can be accessed via text message, USSD menu (for cellphones that are not smart), mobile website and website. Issues raised are tracked in accordance with agreed service standards. An explanation of the service is available at (<https://www.youtube.com/watch?v=jmGkcte7TWE>). This service facilitates direct feedback to the company, which is tied to a tracking system to ensure that each call is responded to.

MajiVoice is an example of an effective feedback system with evidence that the institution is responsive, primarily due to the tracking system. It mitigates the challenges of access by providing many avenues for engagement. However, despite being positioned as an ICT-enabled service, three-quarters of the complaints are filed in person, 21 percent by phone, and less than three percent by SMS or online. This blending of digital and traditional forms of access may be necessary to ensure the success of the service for years to come.

Source: Belcher and Lopes 2016.

Social media platforms can provide a ready solution for government bodies to interact with citizens without having to bear the costs of developing and managing the platform itself, although it requires some effort in terms of change management and response mechanisms. As a result, many make use of these platforms not only to provide information, but also to solicit feedback from citizens. The Canadian federal government agency, Immigration, Refugees and Citizenship Canada (IRCC), uses social media as a customer service tool as users reach out to government agencies at a time and location convenient to them to obtain responses that are personalized to their situation (Gintova 2019). The use of social media in emergency management planning and to mitigate the impacts of natural hazards is also well documented (Chatfield and Reddick 2018; Gascó et al. 2017).

Participatory budget platforms, e-petitions, online public consultations, and e-voting are ways in which governments invite direct input from citizens on decisions to be made for the city. These are designed in a variety of ways and many combine both traditional and digital means of engagement. Moscow's Active Citizen platform is one example of a high-profile initiative that gathers the opinions of citizens and engages them in decision-making, including participative budgeting. Polls are often taken to determine the best teacher or best city park, the programs for local events, the working hours of sports facilities, the location of facilities and equipment provision, and rules such as those governing noise, developments and upgrades, and the choice of city symbols, designs, and street names. The system has more than two million active users, but it has been criticized because voting

is incentivized through points which accumulate towards rewards such as metro tickets or museum tickets. This means that people participate in votes about which they know very little, or which have impacts on parts of the city or services that they do not use (Gritsenko and Indukaev 2021).

Ushahidi's crowdsourcing platforms are based on open-source software aiming to mobilize communities and improve lives, empowering users to rapidly and purposefully gather, analyze, respond, and act on data and information. Since its creation in 2008 as a tool to monitor and map post-election violence in Kenya, Ushahidi's platforms have been used for the rapid collection, management and analysis of crowdsourced information in multiple countries and contexts, including tracking human rights violations in Syria; improving COVID-19 responses in communities in Togo and Kenya; information sharing for assistance requests, assistance offers, and health services needs in Bolivia; and mapping disasters

following the rains that caused several floods in Senegal (<https://www.usahidi.com/>).

Participatory budget initiatives aim to contribute to the exercise of an informed, active, and responsible intervention by citizens in local governance processes, guaranteeing the participation of citizens in decisions concerning the allocation of resources to local public policies, thus enabling local executives to respond to the real needs and aspirations of the population. These initiatives began in Porto Alegre, Brazil, in 1989 (see Box 7 below), and became extremely popular throughout several Latin American cities (Argentina, Bolivia, Chile, Colombia, Ecuador, Mexico, Peru, and Uruguay) in the early 2000s, as reported by the Inter-American Development Bank (2005). Recent data suggests that participatory budgeting has garnered worldwide popularity, with processes initiated in cities across the five continents (Ganuza and Baiocchi 2012).

> > >

BOX 7 - Participatory Budgeting in Porto Alegre, Brazil

In 1989, the newly elected mayor of the city of Porto Alegre (Brazil), Olívio Dutra of the Workers Party, initiated the first experience with participatory budgeting. At the time, the main goal was to give voice to the poor in choosing how public resources were to be used by the city's executive. The institutionalization of neighborhood budget committees aimed to stimulate popular participation in the allocation of resources to the citywide budget. The committees meet regularly to deliberate over proposals initiated by citizens and treated by the different functional branches of the local executive, such as public safety, parks and recreation, transportation, education, among others. After deliberation, the proposals are consolidated into a draft budget to be voted by the population. The cycle is repeated every fiscal year and the top proposals are implemented by the local executive. Since its inception, participatory budgeting in Porto Alegre has evolved to include an online voting option, resulting in an 8.2 percent increase in total turnout (Spada et al. 2015). The participatory budgeting process has been credited with improving popular control over government officials, reducing clientelism, and enhancing the opportunities of social segments that have been historically excluded from development, integrating them as active subjects in decision-making processes. The majority participation of people from the lower classes and the prioritized investments, mainly in the area of infrastructure, attest to the popular appeal of the proposal.

Source: Fedozzi, 1998.

In Germany, Lindner and Riehm (2011) found that an e-petition system led to more people signing petitions and greater involvement of young people, but that it did not improve representativeness. Those submitting e-petitions reflected a similar profile (educated, male, employed) as those doing so through traditional channels. These concerns regarding a gender bias in e-petitions are tempered by a more recent large-scale study of e-petitions in 132 countries that found that, on a global scale, women sign more e-petitions than men. And though men create more e-petitions than women, petitions created by women are, on average, more successful at generating policy response (Mellon et al. 2017). Still regarding the profile of e-petition signatures, Åström et al. (2017) found that participation in the *Malmöinitiativet*, an e-petition system in Sweden, tends to attract citizens with weaker connections to formal politics and more dissatisfied with the way democracy works. This study also indicated that among users of the e-petition system, the proportion of those changing predisposition toward government from negative to positive exceed the proportion of those in experiencing the reverse change.

Box 8 below presents a multicountry platform. The Annex to this note provides a table with a comprehensive list of examples.



> > >

BOX 8 - UNICEF's U-Report System (Uganda, Rwanda, Burundi, DRC, South Sudan, Nigeria, Mexico)

U-Report is a messaging system for young people, launched in 2011 in Uganda and currently deployed in 68 countries with more than 11 million users. Users can access information with the help of automated bots, report issues like violence and school experiences, and participate in polls on topics such as employment, child marriage, and health. Live chats offer one-on-one advice and information with all participation being anonymous. The platform has been used to mobilize the youth to respond to floods (in the Caribbean and Sierra Leone), to deal with health threats (in Mozambique and Liberia), and to improve menstrual hygiene in 20 countries.

Young people who use the platform rate the experience as positive. Many say that they have gained information and shared it with friends or family. The results of polls are reported to national governments and policy makers, as well as published in the press, although it is not clear that any changes in policy can be attributed to the influence of U-Report. There have also been criticisms that U-Report is biased towards more educated young people and government employees.

Source: <https://www.unicef.org/innovation/U-Report>.

CivicTech, through enhanced participation and engagement, has the potential for increased citizen voice and the aggregation of citizen voices into identifiable patterns, that can be used to inform policy, but it may also lead to increased frustration if action falls short of expectations. However, improvements in service delivery are not always evident and consultative platforms do not automatically lead to citizen empowerment.

Government responsiveness is improved if feedback is routinely reported, if responses are disclosed, and if the tools are widely used and combined with offline actions (Peixoto and Sifry 2017). Most importantly, Peixoto and Sifry found that feedback mechanisms that result in meaningful change to services, always involve the relevant government structures in designing the feedback mechanism and response.

3.5 Collaboration and Co-creation, Co-production, and Co-design

The third type of CivicTech comprises technologies that are used for and entail collaboration between citizens and governments. This more ambitious form of collaboration entails the co-creation, co-design, co-implementation, and co-diffusion of initiatives. CivicTech collaboration initiatives are typically more focused on deliberative policy making rather than improving efficiency, efficacy, access, quality, and responsiveness of service delivery. While many of the tools for participation and engagement reviewed in the previous section can be used to enhance deliberation and democracy, in practice they are limited by both the nature of the technological solution and by the goal assigned to them by government officials. In contrast, the initiatives discussed in this section combine concerns with service delivery and perspectives on individuals as citizens in a democratic polity – see Annex for a more examples.

Living labs is a term used to describe public-private-citizen partnerships which aim to co-create problem specific solutions and strategies (Amenta et al. 2019). Because living labs are highly focused on a context-specific identification of needs, they are better able to mobilize “tacit knowledge” from local actors and involve actors from the public, private, and not-for-profit sectors to enhance trust and secure legitimacy in decision-making.

Openness and user-centric approaches are emphasized in co-creation when using a Living Labs approach, as they provide opportunities to foster collaboration, interaction, and

dialogue between state and non-state stakeholders, often with a strong user-driven prototyping focus (Bharosa et al. 2021). Living labs leverage local resources from strategic networks to develop real-life testing and prototyping solutions to problems that cannot be solved by the staff in ministries, cities, or single departments alone (Baykurt and Raetzsch 2020). The initial Kenya Open Data Initiative, for example, was the co-creation of a group of staff/stakeholders from the Kenyan Ministry of ICT and the ICT Board, private sector including Google and Socrata, and civil society including the Open Institute, and Code4Africa, with support from the World Bank.²¹

The development of a living lab entails five stages (Amenta et al. 2019): co-exploring, co-design, co-production, co-decision, and co-governance. Living labs have been used to address issues such as circular regeneration of waste-scapes in peri-urban areas in Italy and the Netherlands (Amenta et al. 2019); early warning systems for urban flooding in Belgium, the Netherlands, and the United Kingdom (Veeckman and Temmerman 2021; Verbeiren et al. 2018); adoption of sustainable building technologies in the Netherlands (Puerari et al. 2018); crime prevention and urban regeneration in Eindhoven, Netherlands (Meijer and Thaens 2018); and prototyping simple telecommunications solutions, providing agricultural services, and developing ICT solutions for small, rural traders in South Africa (Coetzee et al. 2012). Box 9 below describes the living lab approach in Tanzania.

> > >

BOX 9 - Tanzania Living Labs

In line with the National ICT Policy implemented by the Ministry of Communication, Science and Technology, Tanzania supports a number of Living Labs through the Tanzanian Commission for Science and Technology. These Living Labs have been studied to better understand their role in innovation in Tanzania.

The two best-known are Buni Hub and the KINU hub located in Dar es Salaam. With 4,000 registered users, the Buni hub provides space and networking for projects, businesses, and innovators and attracts mostly university students and graduates. KINU hub was founded by young entrepreneurs and is a co-creation space for technology developers. Both of these hubs are self-sustaining and have advanced technological capacities.

Other Living Labs in Tanzania take a different approach. They combine community development, ICT, and local innovation to focus on finding innovative solutions to problems identified by the community, and often develop more low-tech solutions than is traditional for Living Labs. While ICT is not necessarily part of the solutions they develop, they have been successful in building engagement, particularly among young and unemployed school dropouts, and have been able to create businesses and employment opportunities.

Source: Hooli, Jauhianen and Lähde, 2016.

Like most collaboration efforts, Living Labs face challenges related to collective action and trust among the actors involved. These challenges also stem from their deployment to deal with complex problems characterized by “conflicting demands of inclusion, equality, accessibility and innovation around technological questions” (Baykurt and Raetzsch 2020: p.785).

CivicTech tools can also play a role in enhancing trust and creating the conditions for the legitimation of public policies. Deliberation in citizen sourcing initiatives is regarded as an extremely powerful tool to address problem-solving due to its ability to increase trust, build capacity, and improve participation (May and Ross 2018). Administrative rulemaking can benefit from the use of digital deliberative tools to include individuals and organizations that are traditionally excluded from regulatory processes (Nam 2020). Decisions emerging from these types of networked interactions are more likely to be perceived as legitimate, based on principles of subsidiarity, expertise, and reputation rather than on traditional forms of representation (Milan and Hintz 2013).

Hackathons are events aimed at developing software applications to solve specific challenges (Robinson and Johnson 2016). Hackathons provide a mechanism for collaborative design; the events typically attract a narrow spectrum of tech specialists and the problems to be solved, and the approaches are largely controlled by the organizers (Berg et al. 2021).²² Hackathons can be used to rethink current uses of technology to promote sustainable civic behavior and enhance social justice, for example. However, recent evidence also suggests that solutions developed in hackathons may not be sustainable, producing short-lived projects that fail to address the complexity of issues at hand. An empirical study analyzing development patterns of 11,889 US-based hackathon projects found that only seven percent of the projects maintained activity six months after the hackathon event (McIntosh and Hardin 2021). Another large-scale study conducted by Nolte et al. (2020) found that long term extension of projects developed during hackathons is dependent on the skill diversity of team members, their technical capabilities and their intention to extend the project. Interestingly, the authors also find that success is inversely related to intensive short-term activity, suggesting that long-term commitment is not contingent on short-term enthusiasm.

New domains of application for Internet of Things (IoT) sensor systems can include designs attentive to volunteering civic behavior, as suggested by DiSalvo and Jenkins (2017) in their investigation of the use of IoT to reduce food waste in social service provision. The engagement of profiles beyond the tech

specialists, such as social and human sciences, economics, architecture or natural sciences, can also enrich the quality of the products to be developed and better respond to citizens' needs. More generally, existing CivicTech can be redeployed to engage citizens in co-creating public infrastructures, applications, and new forms of governance (Brynskov et al. 2018; Mulder 2012). These initiatives should involve the ecosystem of citizens, businesses and civil society to develop partnerships, mature scalable solutions (Mora and Bolici 2017; Zygiaris 2013), focus on user needs (Baykurt and Raetzsch 2020), and enact changes in digital culture in order to win trust and acceptance, fostering curiosity, rapid prototyping, and the avoidance of “thinking in silos” (Digitalstadt Darmstadt 2018: 32–33).

Deliberative policy making relies on rational arguments generated by a wide range of stakeholders. Online platforms evolved to explore the diverse perspectives of different stakeholders and help overcome the limitations of confirmation bias and filter bubbles associated with social media platforms. Digital platform moderators play a pivotal role in facilitating active discussions, encouraging both within-group and between-group interactions to avoid increasing levels of homophily and polarization witnessed in social media platforms (Medaglia and Zhu 2017). These platforms can be designed to promote tolerance and respect for other people's opinions (Kim et al. 2019). They help to increase the number and diversity of actors engaged in deliberation by including prior marginalized groups and expand the knowledge available for deliberation, thus improving social equity outcomes as well as the overall quality of the policy making process.

The design, adoption, implementation, and evaluation of public policies can be significantly improved with civic technologies. Co-creation involves several steps (Jarke et al. 2019): (1) identification of the problem to be solved; (2) co-generation of ideas to solve the problem; (3) co-design of an implementable solution; (4) co-collection and edition of data; and (5) co-diffusion of the solution. While participatory solution design tends to limit end-users to the role of information and feedback providers, co-creation is characterized by the constant iteration between citizens as end-users, developers, and other relevant stakeholders.

Both deliberative policy making and co-creation of public policies require significant amounts of data. More often than not, these data are not open, thus requiring an involvement of co-creators in the collection and edition of data, including data generation, content editing, writing texts and descriptions, and producing photos and videos (Berker et al. 2018). A project aimed at co-creating a mobile city district guide with and for

older adults in Bremen, Germany, relied on data walks to engage this demographic in co-design activities (Jarke 2019). The project experienced difficulties regarding the availability of relevant open data, so one of the strategies was to engage senior citizens in the collection and co-creation of data to serve the needs, wishes, and interests of the users (Jarke et al. 2018).

Unlike the first two stages of CivicTech, collaboration and co-creation initiatives can be initiated by any of the stakeholders. This includes the actions of activists using open data to identify problems and raise awareness and suggest alternatives (Milan

and Hintz 2013; Sun and Yan, 2020) and apps developed to empower individuals (Rotich, 2020; Thomas et al. 2022). Technology reduces transaction costs for collective action. Such activists can engage constructively with government. However, in some cases, these represent an “emerging form of organized civil society” (Milan and Hintz 2013) based on loose, informal structures, individual connections, and a lack of hierarchy. Where such groups reject principles of democracy such as representation and structured modes of operation, it becomes difficult to collaborate effectively (Milan and Hintz 2013).

> > >

BOX 10 - Bluemap Environmental Data and Activism in China

The Institute of Public and Environmental Affairs (IPE) is a nonprofit organization in Beijing, founded in 2006 by an environmental journalist. It promotes public participation in environmental issues by making relevant data available and coordinating responses to environmental issues. The activities of IPE are aligned with legislation that ensures the citizen’s right to know about the environment and regulations on open government information.

Among their activities, IPE has created a “blue map” which consolidates data on air quality, water quality, and enterprise pollution from national and local government sources and presents it in an accessible format. The Bluemap app is used by more than 3.5 million users to identify local sources of pollution. IPE also facilitates citizen feedback on polluting activities using a micro-monitoring system based on the Weibo social media platform.

IPE has also created a Pollution Information Transparency Index that measures how well local governments are adhering to these regulations and uses the index to pressurize them to embrace open data. Because IPE operates in line with established laws, their work is seen as complementary to government efforts rather than confrontational. This has resulted in some local and provincial governments incorporating the Weibo feedback into their operational processes to enforce environmental regulations and ensure sources of pollution are addressed. As a result of its different activities, IPE has been able to influence government, companies, and citizens to strengthen legislation, change polluting practices, and engage to address environmental issues.

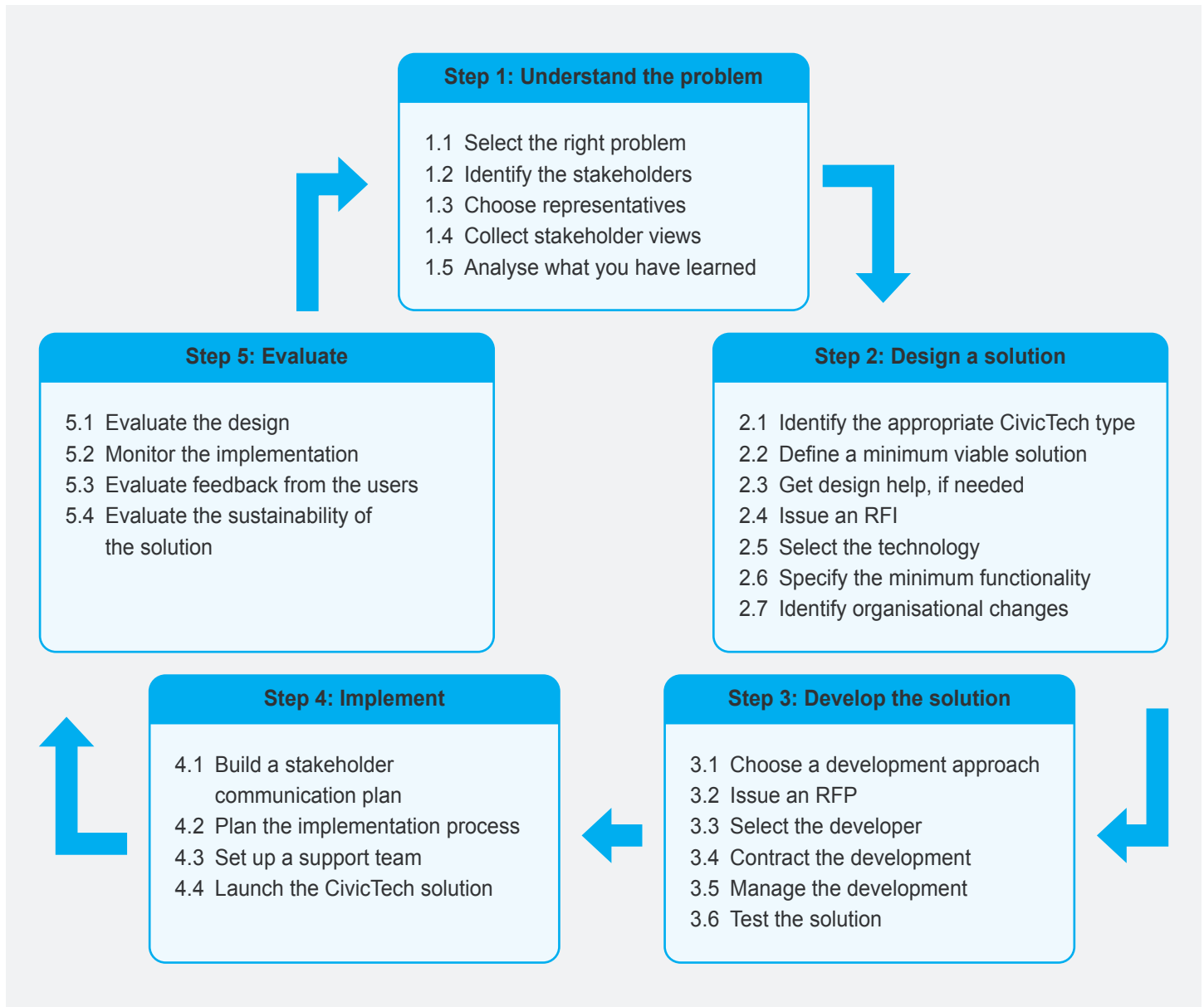
Source: Sun and Yan, 2020.



How to Adopt, Implement, and Assess CivicTech

To go from a CivicTech idea to a fully functioning CivicTech solution is a complex process that can be daunting. The process can be divided into five phases: understand the problem, design, development, implementation and evaluation. While these phases generally follow a sequential pattern, they are likely to be iterated several times, depending on the complexity of the problem, before arriving at an acceptable solution. In addition, the rapid pace of technological change may require a rethink of previous stages. The CivicTech solution cycle is below in Figure 4. This cycle may not apply in this exact form to every CivicTech project, but can be adapted as needed.

FIGURE 4 - The CivicTech Solution Cycle



Source: Authors.

CivicTech solutions are required to evolve and are unlikely to ever be complete. Because of the rapid changes in technology, any solution developed is going to have to change on an ongoing basis, and solutions will require ongoing financing for sustainability. Operating systems and other software on which any solution depends will be upgraded or discontinued; changes in user expectations will require changes in functionality, and new tech devices or capabilities will emerge that will need to be incorporated. What this means

is that any commitment to a CivicTech solution also requires a commitment to its ongoing support and development. It is important to plan for the whole life of any CivicTech solution. The cyclical model is intended to emphasize that the process does not end. It is also intended as a warning that CivicTech development should not be embarked on lightly. Developing a solution and then having to discontinue it may erode trust with stakeholders and hinder future initiatives.



4.1 Understand the Problem

Identifying the problem and agreeing on common goals for the solution is key to successful CivicTech. CivicTech solutions are more likely to succeed if they arise out of ongoing engagements with stakeholders through which problems surface. If there has not already been engagement with the stakeholders for which the solution is intended, it is important to begin with a general engagement to ensure that all stakeholders share similar perceptions on what is and what is not a problem. What looks like a problem to one set of stakeholders may not look like a problem to others.

Socio-technical problems look different to different people and the only way to arrive at a common understanding is to speak with the people who will use the solution. Research into the high failure rates of information systems in developing countries identified a mismatch between the design and the reality of the users as the primary cause of failure (Heeks 2014). CivicTech necessitates engagement with stakeholders to really understand the prevailing context and culture. In reality, coming to a clear and common vision about the problem to be solved will be messy as will the solution to be tried, and participants will need to use various methods to consult and come to a consensus in an iterative way about the goals of the project and the most appropriate CivicTech solution and the appropriate technology to make these goals come to fruition.

4.1.1 Select the Appropriate Problem Issue

Not all problems can be addressed through CivicTech solutions and so it is recommended to start with a well-defined and manageable problem that can be addressed with an easy-to-use platform designed to facilitate wide participation and deliver effective results (May and Ross 2018). If simple problems can be solved, then the experience gained will make it easier to address more challenging issues.

Problems are simpler if they: involve fewer stakeholders, are well-understood; are uncontroversial; and are considered low-risk. The fewer stakeholders involved in any problem, the fewer differing viewpoints there will be and the easier it will be to arrive at a common understanding of the problem. It will also require less time for consultation and feedback and be less likely to be controversial. Problems are deemed controversial if there are strongly held, opposing views on what the problem is and how to solve it. It is preferable to address less divisive issues because solutions are more likely to succeed, given overall buy-in. More ambitious efforts can be built upon this success. Such a gradual approach is likely to produce increased trust over time. CivicTech developments are high-risk if they involve multiple stakeholders, when there are multiple opposing views, where they deal with sensitive data, where personal safety is at risk, where new, cutting edge technologies are used, and where developments are going to be used in a highly volatile context.

4.1.2 Identify the Stakeholders

In order to understand the problem, and whether it is amenable to a CivicTech solution, it is necessary to identify the right stakeholders and to speak to everyone involved. It is a common mistake to believe that, because of prior knowledge of technology and experience of solutions, the problem is already well understood. Each stakeholder, including those initiating the CivicTech, only understands the problem from their perspective. Stakeholders in a problem for which CivicTech could be a solution include everyone who is part of the problem and those who need to be part of the solution. These may be different groups of citizens, civic organizations, government agencies, service providers, businesses and technical experts. Make as complete a list as possible of the stakeholders and potential stakeholders. Think through each part of the problem and decide who might need to be involved.

Note that for certain CivicTech tools, such as 311 systems, participatory budgeting, e-voting or e-petition systems, citizens are the primary target group. These tools enable individual interaction. In contrast, living labs tend to involve a much more diverse set of individuals and organizations, each with particular contributions and concerns that will be at the core of the successful deployment/diffusion of the CivicTech solution.

4.1.3 Choose Stakeholder Representatives

Inclusion is central in the identification of partners in the implementation of CivicTech tools. In some instances, equal access to the tool is a basic requirement of the system – such as for 311 systems, e-voting and e-petitions – and stakeholders should be selected appropriately to ensure that the views of all are represented. Equal opportunity and fair representation across such boundaries as gender, race, age, religion, sexual orientation, marital status, employment status, and income group are particularly important, and should be cultivated from the very beginning, if the CivicTech initiative aims to empower people or engage in collaborative design and implementation of public policies. As the level of complexity involved in the CivicTech tool increases, inclusiveness may become more difficult to achieve and, simultaneously, more crucial to the success of the initiative.

Selecting who will assist in the design and development of the CivicTech depends on the nature of the solution and the availability of stakeholders. Key considerations include the following:

- Involve at least people from each stakeholder group.
- Within a group aim for diversity.
- The diversity needed depends on the problem and who it affects.
- Who participates may depend on who is available and willing.
- If the target users are geographically dispersed, include people from a number of locations.

Consider also how to approach stakeholders who have not been previously engaged and what incentives may be needed for them to participate. The value of participating may be obvious to a company or business, but may be less obvious to citizens. Offering rewards for participating may help to achieve equitable representation and secure a diverse set of preferences and points of view, but it requires monitoring to ensure that the results still reflect the values of deliberative democracy. While some trade-offs may occur between the use of financial incentives and data quality, international organizations such as the OECD consider it good practice to offer remuneration, and/or providing or paying for childcare

and eldercare to participants of deliberative policy making processes that rely on randomization/stratification to ensure the group broadly matches the demographic profile of the community (OECD 2020).

4.1.4 Collect Stakeholder Views

If the project is already working with the stakeholders, seek opportunities to discuss the following questions through existing channels. The nature of the engagement will depend on the context, the usual ways of engaging, and considerations like the literacy of the participants and the need for translation. In the same way that no business will develop a product without understanding the market, for CivicTech the equivalent of market research is needed to understand what the target beneficiaries want. This is done by identifying the stakeholders involved in dealing with the problem and developing a set of questions for each stakeholder.

The questions may include the following:

1. Can you tell me about _____?
What is happening?
2. Is this a problem? Why or why not? Who is it a problem for?
3. Why is this happening? How long has it been happening?
Was it ever different?
4. Does the situation need to change? Why or why not?
5. Have there been any attempts to change it? What was done and what happened?
6. What do you think needs to happen for it to change?
7. Could that happen? Why hasn't it happened already?
8. What is the one thing that we could do to help?

Decide on the best way to engage stakeholders. Match the approach to the problem and the type of solution that is envisaged. Ask for their input using surveys, interviews, focus groups or community meetings. Think about the resources required for different types of engagement—time, effort and money. Also consider which approaches will get the best responses for a stakeholder. Be sensitive to power imbalances that may prevent some people from speaking out in the presence of others.

4.1.5 Analyze What Has Been Learned

It is a good idea to have a team of people analyze the information collected to identify what the problem is, why people think that this problem has arisen, and what can be done about it. Keep notes on the discussions and develop the document described below during the analysis.

First identify **what** the problem is. Describe it in detail, together with who is involved, why it has arisen and why it is a problem.

It may be necessary to explain the background and context of the situation.

Next, try to understand **why** this problem is happening. The aim is to develop a theory about how (and why) the negative effect follows from the current circumstances because from that, it will be possible to identify interventions that can solve the problem. The theory may be wrong, but each iteration of the CivicTech solution cycle will test some aspect of that theory and refine it.

Finally, see what stakeholders have said about **how** the problem might be addressed. Note if different groups have different solutions and think deeply about which approaches will have the widest benefits. Pay particular attention to things that have been tried before and why they didn't work. This will prevent making the same mistakes again.

Depending on the level of engagement that is comfortable and practical, and the nature of the CivicTech anticipated, consider involving a number of the stakeholders in the analysis. This can help to make sure all voices are heard. Of course, for a co-design and co-creation project, this process will be done with the stakeholders.

There may be more than one understanding of a problem and more than one theory as to why it is happening. Therefore, as part of the analysis, decide whether it is feasible to accommodate multiple understandings and theories in the design of the solution or whether to focus on the problem from just one perspective.

4.1.6 Document the Problem

End this phase by documenting the problem. The description should include:

- Background information about the history and social context of the problem.
- A description of what is happening.
- Details of who is involved at each stage and what their roles are.
- An explanation of the negative effects or impacts and why this is a problem.
- Brief descriptions of the theory of why this is happening²³ and any supporting evidence.
- Any ideas that have been collected about what can be done to solve the problem.
- Ideas about how to measure if the intervention is helping.

This document will be used to ensure consensus or at least the majority agree on the problem and the goals of the project.

Share this problem statement with the stakeholders that are involved and get their feedback on the current understanding of the problem. Refine the document until the majority of stakeholders agree (or agree to disagree).

This problem statement document also has other uses.

1. To support funding applications or to motivate the project.
2. To publicize the project.
3. To guide decisions about who to partner with.
4. In a Request for Information and/or Request for Proposals to a technology partner.
5. As the primary input to the design process.
6. In the evaluation phase to decide if the project goals are being met.

Be aware that it may not be possible to agree on the problem in divided societies with very low levels of trust. In such contexts, focus on building trust before undertaking any CivicTech.

4.2 Design

The way in which design will be approached depends on the kind of solution to be developed. For a co-designed, collaborative project the steps will be different.

4.2.1 Identify the Appropriate CivicTech Type

Start by thinking about the three levels of CivicTech described in Chapter 3 to see what problems the different levels of CivicTech have been used to solve and identify how similar problems have been addressed using some of the examples shared in this chapter and provided in the Annex. This could provide ideas on how to proceed.

CivicTech initiatives focused on information sharing, transparency, and open government allow participants to track relevant information about individual requests, to use open data for civic purposes, and to stimulate involvement in a given initiative. In societies characterized by low levels of trust and social capital, small steps in openness and transparency can produce visible results for citizens and help to overcome culturally or historically embedded distrust. Easy-to-use platforms capable of securing effective problem-solving could help to build confidence to deploy CivicTech initiatives to more challenging issues. Openness and transparency goals can be served by CivicTech tools promoting communication in one direction and geared towards sharing information and

data, and accountability reporting. If the goal is one-way communication, there is no advantage in using CivicTech tools aiming at two-way or multi-way communication.

Openness and transparency involve providing information in a format that can be retrieved, transformed, used, treated, or analyzed by any of a multitude of stakeholders. Different CivicTech tools (and technologies) may appeal and provide information to different stakeholders. For example, a municipal transparency index developed by an NGO is more likely to appeal and be more relevant to local officials and the general public living in the municipality, or journalists seeking to report on the mismanagement of public funds. On the other hand, a public procurement platform intended to disseminate public information on public contracts is likely to attract the attention of companies wishing to engage in contracts.

Beyond information sharing and transparency, civic engagement may focus on consultation and information gathering from citizens. This level of engagement requires feedback from citizens in order to prioritize public goals and initiatives, comment on policies, and express preferences to decision-makers. When participation and engagement is the major goal, consultation, feedback, and other tools that allow interaction become relevant and may need to be adapted to these purposes. Note that CivicTech tools with these aims do not require synchronous communication, but merely the possibility of call and response and a way to register feedback or preferences expressed by citizens.

More complex problems and more ambitious goals place additional stress on CivicTech solutions. Co-creation initiatives and citizen empowerment entail a much deeper level of engagement on the part of citizens and a firm belief that the time invested in organizing working groups, democratic mini-publics, or living labs, among other initiatives will result in deliberative decision-making, meaningful change, and lasting outcomes.²⁴ At a deeper level of engagement involving deliberation, collaborative design, or other forms of co-creation, synchronous communication is crucial to accomplish successful citizen empowerment. The most pressing issues raised by citizens usually involve complex problems and require CivicTech tools able to involve larger and more diverse groups in multidirectional communication. These processes may run the gamut of steps in collaborative design, from identifying appropriate CivicTech solutions to setting up the mechanisms for the joint evaluation of outcomes.

4.2.2 Define a Minimum Viable Solution

It is virtually impossible to design CivicTech and get it right first time, so the process for design needs to be iterative.

That means designing a pilot—the smallest possible solution, implementing it and evaluating to see if it is having the right kind of impact—before deciding whether to continue, what to change, and what next to implement. This approach also means doing the least harm if the solution has any unintended negative consequences. The project can be stopped or the direction can be changed before much harm is done.

The first design step should be to identify a “minimum viable solution.” That is the simplest solution, with the fewest features to be functional and have some impact. Develop and implement this minimum viable solution and evaluate the impact before considering more features. Remember that, in practice, most CivicTech solutions do not work and are abandoned. The only way to know if something will work is to test it. For this reason, it is better to invest as little time and money as possible to get to a working solution that can be tested. It is also important to be ready to abandon the project, or start over, if the desired results are not observed in the test (pilot) phase.

The design may use existing technology components, configured in an innovative manner. Technology solutions may necessitate developing new software, but they could equally involve buying a technology system or renting a service provided by, for example, a platform – see section 4.4.2. Even when software is to be developed, it could be done by combining or modifying existing open-source software. Very often, solutions can be crafted by combining a number of such components. In any case, it is still necessary to have an overall design for which components will be used, how they will fit together, and how the processes around the technology will work. For this, someone who knows the technology components well and understands how to create a solution out of the technology is needed.

4.2.3 Get Design Help, if Needed

Technology design is a highly specialized field. While it is possible for an amateur to design a system, it is the equivalent of designing a house without an architect. The house may be quite acceptable, but an architect can bring professional knowledge that will make it much better. An architect will also know how to design for cost savings, stability, and livability. Likewise, an ICT professional will be able to anticipate pitfalls and make recommendations that will produce a CivicTech solution that works better, and is more cost-effective and easier to use.

Quite often, the best way to get design expertise is to partner with a company that provides a design service. The challenge here is that most such companies will be selling a particular technology and will create a design that uses the

technology they sell. It is usual to select the technology as part of the design process because what (solution) is possible will depend on what the technology can do. The balance between the capabilities and limitations of any particular technology involves subtle trade-offs that can seldom be recognized by anyone without in-depth knowledge of both the problem and the technology's capabilities. But at the same time, it is important not to be locked into a particular technology and provider too early in the process.

The way around this is to issue a Request for Information (RFI) which solicits proposals for the design of technology solutions from a number of potential partners. This gives several potential partners an opportunity to propose different technologies and investment models, and the contracting organization gets to evaluate a number of solution designs and potential technology partners. Even if your organization has in-house ICT skills who will develop the solution, it would still be worth issuing an RFI. Ask the in-house developers to respond to the RFI or, if you are the expert who will be designing the solution, you should respond to the RFI. That way you can be sure you are thinking through all aspects of the design. Use these responses to compare the proposed in-house solution to other proposals.

4.2.4 Issue a Request for Information

An RFI solicits ideas about technologies, what they can do and why they might be useful to solve the problem. It does not include budgets or time estimates, although it might give some idea of the overall scale of the cost. At this stage, the aim is to learn about the company (or individuals) proposing the technology to inform the decision on whether to partner

with them or not. It is also an opportunity to learn about the technology, what it can or cannot do, and what is involved in making it work.

An RFI should include:

1. The description of the problem that was produced at the end of the problem definition phase, which includes any existing ideas for solutions.
2. Eligibility requirements for the companies or people responding and the documents needed to evaluate that eligibility – for example, certificate of incorporation, financial records, proof of similar projects completed, references, skills profile, equity profile.
3. A request for preliminary information about their design ideas, including technology and investment options that they propose.
4. Details of how the responses should be submitted and the deadline.
5. Contact details of the person who will answer any queries.

Share the RFI as widely as possible to get a reasonable range of responses. Look for companies that might be likely to offer the service required and send it to them directly. Also, ask organizations that have produced similar CivicTech about who they worked with. Be creative about using networks to pass it on.

Evaluate the responses to the RFI to identify which partners to continue the work with. Some guiding principles for this evaluation are:

> > >

TABLE 1 - Guiding Principles for Design Evaluation

Evaluate the partner	
Experience	What skills do they have? What is their staff turnover? Have they developed similar systems before?
Stability	How long have they been in business? Are they likely to remain in business (financial stability)?
Customer service	How do they engage with clients? What support is offered? Are past clients happy with them? Look for reviews; speak to other/previous customers.
Reputation	Does the company have a reputation for ethical business practices, particularly with respect to digital rights?

Evaluate the design and/or technology	
Fit for purpose	Will the proposed technology do what the system needs to do? (Don't accept verbal promises, ask to see a working example installed at another client.) Will there be compromises on some functionality? This is common, and some trade-offs will have to be made.
Stability	How long has the technology been around? Are there readily available skills (on the open market) to implement the technology? How many installations are there? Do clients experience downtime?
Currentness	Is the technology regularly improved? How often are there new releases? Who owns the technology and are they likely to be in business for some time?
Security	Is the technology secure? How is security tested? What are the risks?

Source: Authors.

The same questions should be asked of any design proposed by an internal software development team.

4.2.5 Select the Technology

The technology to be used will usually be selected as part of the design process. Technology in this situation refers to the software, platforms, and sometimes (but not always) the physical hardware. Generally, physical hardware is generic and can be rented as a service, rather than bought, unless the system includes specific items, like sensors, that have to fit a particular specification. Refer back to the principles for technology selection in section 4.4.2, and then consider the points that follow.

Use tried and tested, well-established technology. New technologies, while they may sound sexy, come with the challenge that they are not well tested and may have been implemented in a small number of situations. This means that unexpected technology problems can hold up the CivicTech development, adding to costs. There are also likely to be fewer skilled people around who can develop using newer technologies. Even if a technology partner has the skills there may come a time when it is necessary to hire people directly to support the system in the long term.

Select technology on the advice of trusted technology partners, not what the popular press is reporting or because the technology is in the news. This may seem obvious, but often decisions are made on the basis of well-meaning, inexperienced advice. For example, listening to podcasts on new technology

does not give enough depth of technical understanding to make these (often expensive) decisions.

Technology choice is usually a tradeoff between cost and functionality. Any and all functionality is possible; it is just a matter of how much money there is to spend. Start with the budget, consider the technology options that are affordable, and then decide if the functionality they offer is sufficient for the system's needs. When considering the trade-offs between building, buying, and renting alternatives, be sure to examine the short-, medium- and long-term costs, because a solution that looks cheaper in the short-term may often incur higher costs in the long term when maintenance and sustainability are factored in.

Document the choice of technology for the next step in the process. This might be a specific platform or software system, or it might be a type of technology. The more open the system choices can be at this stage, the more options there will be when it comes to development. However, if a particular platform or tool has been identified, a clear record of how that decision was arrived at will greatly simplify matters when limitations arise later in the project and it is harder to rely on memories to remember the current reasoning.

4.2.6 Specify the Minimum Functionality

Finally, with some idea of the technology to be used, the design can be specified. The design is specified in terms of Use Cases (or User Stories). A Use Case is a description of something that a user will do with the system, or how they will

interact with the system. It describes who is interacting with the system, what they do, and how the system responds.

To design a minimum viable solution should require three to five use cases. Any more than that, and it will not be possible to iterate quickly. For example, a simple website to share open data may include the following use cases in the first iteration:

1. The user can find information about the website, who owns it, the data being shared, and what they can do with the data.
2. The user can select one of two views of the data and the data is displayed at a national level. The user can drill down and display the data for a particular district or city.
3. The user can download the data set in two different formats.

A simple feedback app to collect information about infrastructure that needs repairs may need the following use cases.

1. The user can download and install the app, open the app, and agree to the use of camera and location data.
2. The user can take a photograph of something that needs repair and add optional text and submit. The system attaches location and time data to the photograph and transmits the data to a database.
3. The operator views the photographs submitted, by location, and creates a work request or associates the photograph with an existing work request.
4. The user can view the work requests associated with the photographs they submitted, and the status of those requests.

Discuss and agree on the minimum set of use cases among the design team. Note that in these examples, the minimum solution does not include functionality for the user to register, create a profile, or log in. That functionality can be added in another iteration. The idea is to get a first working solution up and running in order to see and assess how people use it. To select the use cases that will make a minimum solution, consider what the users will want to see and what the technology can do.

Describe each of the use cases, using a use case template. (There are templates for Use Cases online.) Use cases are written in simple language and should be easy to understand by people without any technical knowledge. Design the use cases with the users that are involved in each so that they

can agree about what needs to be done and how the system should respond. If the users cannot understand the use case, they won't understand the system.

During this process, record any unusual/new terms down in a data dictionary. This may seem unnecessary, but each system understands terms in a particular way. For example, for an NGO working to assist people to resolve service difficulties with the city, a client may be a client of the city or a client of the NGO organization. A data dictionary is useful to make sure that everyone uses the same words to describe the same things; this prevents confusion and misunderstanding. A data dictionary can also store information that might be helpful for the developers. For example, developers would like to know that the city uses a 16-digit client code for their clients, but that the NGO allocates a 5-digit file number to their clients.

4.2.7 Identify Organizational Changes Needed

Any new system will need changes within the organization that will host the system. For example, some staff will have to take responsibility for things like backups, data protection and management, and security. If the system is collecting feedback from citizens, there will need to be a procedure for how that feedback is recorded, examined, and acted on. As part of the design, responsibilities will need to be allocated and internal procedures designed for these functions. Functions will need to be allocated to appropriate departments. It may be necessary to recruit new staff or to change the job descriptions of existing staff, and there may be a need for training to ensure that staff are able to carry out their new roles. These changes often cannot be made by the contracted developer, although they may be able to identify the procedures needed and the type of employee that can perform the role.

Document these organizational changes. This document will be used to plan for the administrative work and to ensure that time is allocated to make the necessary changes before the responsibilities become necessary as the system is deployed.

4.3 Develop

Once a design is in place, the development can start. Remember that the design includes the type of CivicTech solution, the minimum functionality, the

RFI and the analysis of the responses, any technology decisions that have been made and their justification, the use cases and, possibly, the beginnings of a data dictionary. These documents are the inputs to the development stage.

4.3.1 Choose Development Approach

Weigh up the pros and cons of different development approaches. Remember that a solution may not need new technology to be developed, it may be possible instead to repurpose existing technology. If there is a choice of developing a solution in-house or engaging a company to develop the solution, some considerations in making this choice are summarized below in Table 2.

> > >

TABLE 2 - The Pros and Cons of Outsourced Versus In-House Development

	Pros	Cons
Develop in-house	Builds in-house expertise. Easier to support the solution in the long-term. Not dependent on a supplier company. Greater control of the process and the product. Better integration with internal processes (if necessary).	Can be hard to find and retain technical skills. Takes time to bring a team up to speed. Hard to find support if the team gets stuck. Limits the choice of technology to what the in-house team knows. Can be costly.
Contract out development	Easier access to skills and experience. No need to recruit and manage technical staff. If the company is good, it can be a smooth process.	Requires skill in contracting and managing the delivery of the contract. Requires good communication with the company selected. Can be costly. If problems arise, they can be difficult to resolve.

Source: Authors.

If the CivicTech project is a co-creation project, development may be done by one or more partners in the collaboration, which changes this decision. The development process will then be a hybrid of the two approaches. It will still be necessary to work closely with the development team (as with in-house development) and the project’s progress will need to be managed. Bear in mind that such projects involve working with people who are not employed by the same organization, and with varied contractual relationships, so it may be more difficult to control their work and productivity.

4.3.2 Issue a Request for Proposals

A Request for Proposals (RFP) is similar to an RFI, but asks for details of the proposed solution, the cost, and the timeframe. The RFP will form the basis of the contract for development. If the development is going to be done in-house, it is still important to get the same information from the in-house team because it will be helpful in managing project progress.

An RFP should include:

1. The description of the problem that was produced at the end of the RFI process, which includes ideas for the technology solution.
2. The technology decisions that were made during the design phase.
3. The use cases that make up the minimum required functionality.
4. A general description of possible future requirements, with the understanding that those may change.
5. Eligibility requirements for the companies or people responding and the documents needed to evaluate that eligibility, if not already done in the RFI.
6. Respondents should be invited to submit
 - a. A view on the feasibility of both the minimum solution and the longer-term functionality.
 - b. Detailed information about their development process and the timelines.

- c. Details about the team that will do the development (including CVs of key people).
 - d. A detailed budget, including estimated costs and potential variances over multiple iterations of development.
 - e. Any terms that they want included in the contract.
7. Details of how the responses should be submitted and a deadline.
 8. Contact details of the person who will answer any queries.

If the companies that the RFP will go to have already been pre-selected as part of the RFI, it will not be necessary to screen them again. If, however, the call is to be opened more widely, the RFP will also ask for the information in point 5 above.

Distribute the RFP to already selected partners or more widely. If the RFI did not uncover appropriate partners for the development, then the RFP should be distributed more widely. If an RFP (or an RFI) gets no responses, it may mean that the technology providers don't think that the solution is viable. If possible, discuss with one or two of them to understand their position. Providers who regularly develop solutions have good insights into what can or cannot be done with technology and may be able to prevent costly mistakes.

4.3.3 Select the Developer

Once the responses have been received, they need to be evaluated. Some guiding principles for this evaluation are:

> > >

TABLE 3 - Guiding Principles for Evaluating RFP Responses

Evaluate the partner	
Experience	What skills do they have? What is their staff turnover? Have they developed similar systems before? Do they know the context and constraints?
Stability	How long have they been in business? Are they likely to remain in business (financial stability)?
Customer service	How do they engage with clients? What support is offered? Are past clients happy with them? Look for reviews; speak to past or current customers.
Reputation	Does the company have a reputation for ethical business practices, particularly with respect to digital rights?
Ease of collaborating	Is there a match in terms of process, location, time zone, language, culture etc.
Evaluate the proposal	
Fit for purpose	Have they understood the requirements? Are they able to deliver the required functionality within the budget and timeframes?
Budget	Does the financial proposal fit the budget? Who assumes the risk if things go wrong? What will the worst-case look like?
Timeframe	Do the time estimates fit with any constraints (like budget cycles) and expectations?

Source: Authors.

If the development will be done in-house, evaluate the in-house team using the same criteria and understand the functionality, timeframes, and costs that can be expected.

4.3.4 Contract the Development

Any software development done by a third party will need to be covered by a contract. While this document will need to be examined by a legal department or adviser, it is important that the contract should include the following:

- Clauses about what is to be developed, how and within what timeframe. With iterative projects, the deliverables may be agreed as an addendum for each iteration.
- A clause covering the scope of the development. For example, whether the technology partner will test the solution or whether acceptance testing will be the responsibility of the contracting organization. Another example would be who is responsible for organizational process changes.
- Additional items to be delivered, such as system documentation.
- A clause covering the intellectual property of the solution developed. Where the solution relies on existing platforms or other layers of technology, only part of the solution will be new intellectual property.
- Agreements as to the basis for charging fees. Usually, the costs will be connected with deliverables, for example, for each iteration of the cycle. Alternatively, the contract could be based on time spent, which is fair to the developer, if the project has a lot of uncertainty, but can be unpredictable for the client as development times are unpredictable.
- Agreement as to the timing of payments, which are usually made against deliverables. If the development cycles are kept small, it would be appropriate to pay at the end of each cycle, on condition that quality and functionality measures are met.
- Incentives for faster delivery, in the form of bonuses, may be included, but need to take into account the quality of the development. Penalties for late delivery, in the form of a percentage reduction in price, are common.

4.3.5 Manage the Contract/Development

Whether the CivicTech is developed in-house or through a contracted partner, the process needs to be managed. A contracted developer or an in-house development team will

often provide a project manager, but equally your organization might want to provide a project manager or at least a project contact point to facilitate communication. Project management often incurs an additional cost, which is often worth paying, especially if your organization lacks experience in managing such projects.

Regular progress meetings will ensure that the project keeps on track. Progress meetings can take place once a week, or fortnight, depending on the project, but should always include a report on what has been done, any current or anticipated resource issues (such as staff who are temporarily unavailable), and the financial situation. Progress should be measured against the original plan.

When progress deviates from the original plan, ask for contingency plans or agree to a change in schedule depending on priorities. Expect the development partner to come up with contingency plans to make up any slippage. If they are not able to present alternatives, they may not be paying enough attention to the management of the project. That said, changes can be expected since technology projects are complex and unpredictable. Find out if changes will result in additional costs.

Set up the internal approval mechanisms for payments before the project kicks off and ensure that everyone knows the process as well as the timeframes for invoicing, approval, and payment schedule.

4.3.6 Test the Solution

There are different types of testing for technology solutions. It is not necessary to know all the different types, but it is worth understanding the basic types and who takes responsibility for them. The developer will normally conduct unit testing of individual system components, and integrated testing of how the components work together. Depending on the anticipated use of the system, they will also need to conduct stress testing of how the system operates under pressure – for example, with a lot of users all trying to access it simultaneously. These tests should be included in the contract.

User acceptance testing is conducted once the functionality exists to test the use cases specified in the design. This testing is often done by the client, with guidance from the technology partner if necessary. User acceptance testing checks that each use case can be done and that the results are as expected. Part of that involves testing the performance to see that the system responds quickly enough to meet user expectations. It also tests what happens if the user does the wrong thing – like entering inappropriate data, or tries to access something that

they should not. The system should give an appropriate error message that tells the user what they have done wrong and how to correct it.

Designing tests for all the wrong things that a user might do is challenging and may require some professional help. The expected behavior of the system is what is defined in the use cases. Defining what tests will be carried out, who will do them, and how the results will be recorded can start as soon as the design is complete. This will ensure that testing can start as soon as system elements become available and operable.

4.4 Implement

4.4.1 Build a Stakeholder Communication Plan

Identify the stakeholders and what they need to know about the launch. The stakeholder analysis may include:

- Information for potential users about the project, why they should use it, and how it might benefit them.
- Information for specific users about how they can access and use the solution.
- Information for internal staff about the system, their roles, and plans for the launch.
- Information for partners about their role(s), if any, in the launch.
- Information for the press and general public about the project, its goals, and why it matters.

Decide how best to communicate with each kind of stakeholder and use multiple communication channels. This may include advertising to make people aware of the project and to motivate its use. This can be direct to citizens, via a website, and social media, but may also use traditional methods like posters at bus stops or radio advertisements. Internal staff could be informed through a series of meetings and provided with system documentation. Meet with partners to finalise the launch process.

Develop any communications materials needed. Decide who will produce the content for the different media and take steps to ensure that it is appropriate. Involve stakeholders in the design of communications materials, if appropriate. System documentation may be developed as part of the technical project, but this will usually need to be formatted and published with the help of a designer. Seek the help of your organization's communications department or external agencies to set this up.

Also think about how the project results will be communicated, when, and to whom. It may be good to start quietly and wait until more people are using the system and initial problems have been ironed out before arranging a big, public launch. Ensure fulfilment of any reporting obligations to funders or sponsors.

4.4.2 Plan the Implementation Process

Create a written detailed implementation plan. There are usually a number of steps in the launch process:

1. Ensure that the hardware environment is set up.
2. Ensure that software is loaded, and data and access security arrangements are in place.
3. List steps/process to integrate with other systems.
4. Run final integration testing of the system.
5. Initialize the database to clear out any test data.
6. Test backup and restore processes.
7. Open access to the system / making an app available.
8. Monitor the use of the system against expected usage.
9. Resolve any technical difficulties.
10. Observe user behaviour to see that it aligns with expected behavior.

The specific steps will differ depending on the type of solution. The implementation plan makes sure that nothing has been forgotten and that the sequencing and timing of each step is thought through. Assign responsibilities for each step of the plan. Then communicate those responsibilities, as well as how the process will be coordinated, to everyone involved. Ensure that all the necessary people and time have been allocated to the plan and that everyone understands what needs to be done. The plan should also include the abort conditions—the circumstances under which the launch will be abandoned. This conditionality is usually not necessary with a low-risk system but may be important if a system is high-profile and when any problems may attract unwelcome attention.

4.4.3 Set up a Support Team

In the initial days, weeks, and months post-launch it's important to have help on hand. A support team that can resolve issues quickly will ensure that people do not become discouraged and give up using the system. First impressions count.

Develop a searchable section on Frequently Asked Questions (FAQ) that can be accessed from the app or on a website. Add to it details of any of the steps that might cause problems. As problems are reported, the support team can identify recurring issues that users are having and add to the FAQ to make it more comprehensive. The FAQ is also a resource for the

support team because they can use it to identify solutions to problems that they have not yet encountered.

Create/designate a help desk that people can contact. This does not have to be a sophisticated call center; it can be a telephone number, messaging option, and/or an e-mail address. Ensure that there is a process for logging calls to the help desk so that the kinds of problems arising can be investigated. This will inform the next round of development as well as provide additional items for the FAQ. Designate someone to allocate issues to the people who can deal with them. Some issues will be connectivity problems, and some will be related to operational issues that need patient and calm individuals to respond. Also make sure that the developers are on hand to spot and promptly deal with any unexpected technical problems.

4.4.4 Launch the Solution

Ensure that all in the team have what they need. Deal calmly with issues that arise, keeping a supportive environment.

Take time to celebrate with the team.

Gather information for the evaluation and the next iteration of development.

4.5 Evaluate

The assessment of CivicTech solutions entails a set of dimensions that should be programmed from the beginning of the project. These dimensions can be organized in three stages, so that assessment occurs throughout the process: (1) Design; (2) Implementation; and (3) Evaluation. The first stage – design – consists in assessing the diagnostic of the problem and the design of the solution. It includes three dimensions, as shown below in Table 4.

> > >

TABLE 4 - Three Dimensions of Assessment

Assessment stage	Evaluation criterion	Questions
Design	Relevance	Does the CivicTech initiative serve the needs of the stakeholders? Does the design of the initiative match the reality of the users?
	Pertinence	Is the selected technology adequate to the needs of the participants and the goals of the organizers?
	Coherence	Do the resources made available for the CivicTech initiative match the goals?
Implementation	Efficiency	Is the CivicTech initiative oriented toward extracting the maximum output at minimal cost?
	Efficacy	Does the CivicTech initiative minimize the cost for a given level of output? Are the goals being attained?
	Equity	Are all relevant stakeholder groups covered by the CivicTech initiative in a representative and equitable manner? Is there equal opportunity and fair representation across such boundaries as gender, race, age, religion, sexual orientation, marital status, employment status and income group?

Table 4 continued

Assessment stage	Evaluation criterion	Questions
Evaluation	Usefulness	Does the CivicTech initiative have a positive impact on the target groups/participants? How does the arrival situation compare to the departure situation?
	Sustainability	Does the CivicTech initiative produce long term impacts for the participants?

Source: Authors.

4.5.1 Design Assessment

The first dimension is relevance—the extent to which the purpose of the CivicTech tool matches the diagnostic of the problem. In practice, this means that the needs of the participants and the challenges created by the problem should be considered when choosing the CivicTech tool. A tool is relevant if it targets the problem and responds to the needs of the participants in an effective manner. The second dimension is pertinence—the way the selected technology responds to the needs of the participants and the goals of the organizers. While relevance is primarily concerned with the articulation between participants and the profile of the CivicTech tool, pertinence is focused on the technological translation of this link. The third dimension in assessing the design is coherence. Coherence evaluates whether the resources made available for the CivicTech initiative match its goals. Lofty goals without proper back up from human, financial, and technological resources are likely to result in failure. Participants’ expectations will be crushed if a promising CivicTech solution is not supported by adequate resources, and the initiative will lack coherence.

4.5.2 Monitoring Implementation

The second stage is monitoring the implementation of the CivicTech solution. Successful solutions should be both cost-efficient, oriented towards extracting the maximum output from the solution for a given minimizing the cost for a given level of output, or aiming to attain the goals at minimum cost. Efficiency is concerned with the use of resources to deliver results, and seeks to compare costs and benefits to make decisions regarding alternative resource allocations during the implementation stage. A high participation rate, for example, may be an indication of good results for a given CivicTech initiative, but not necessarily a sign that the initiative is producing meaningful change. Thus, efficiency needs to be complemented by efficacy, which assesses the link between the goals of the CivicTech initiative and its impacts. In the case of 311 systems, for example, the program may have very

high levels of participation indicating an efficient initiative, but if complaints from citizens are not resolved by the City Hall, then the CivicTech initiative will not be deemed as effective as it could be.

4.5.3 Impact Evaluation and Feedback

The last stage focuses on evaluation of the CivicTech solution and should be concerned with two dimensions: usefulness and sustainability. The usefulness of a CivicTech tool refers to its impact on the needs and problems of target groups or participants. Ideally, any CivicTech solution improves the initial condition experienced by participants in order to reach an arrival situation that reflects the positive impact of the tool. The second dimension is sustainability. A CivicTech solution is sustainable if it delivers major changes to participants that are expected to last in the long run.

Evaluation of a CivicTech solution means working out whether the tool/system that was developed is solving the problem as intended. To do this, it is important to revert to the problem document that was produced at the end of the first phase to review the identified problem and how the solution and improvements were going to be measured. As with the design phase, remember that it is the whole solution that needs to be evaluated, not just the technology. Are people are using it? How are they using it? Are they getting the intended results? Do users have a good experience?

To measure if people are using the solution, count how many people engage with the entire solution. This does not mean counting how many times the app has been downloaded, or how many people have visited a website. The use of a solution can be understood as a series of funnels, leading into each other. If 10,000 people attend a webinar to hear about the solution, maybe 1,000 will go to the website to learn more and perhaps 100 will download the app. Of those, probably 10 will show commitment by creating an account and perhaps one of the ten will log in and use it daily (or weekly or however often

it was intended to be used). The conversion rate (from 10,000 to 1) is the real measure of use. This can be measured using tools like [Amplitude](#).

4.6 Iterate

Once the first cycle of development is complete and the results are acceptable, the cycle begins again, with some modification of each of the five stages, as outlined below.

Stage 1: Understand the problem now entails a review of how the problem was understood and whether that understanding needs to change in any way. It also entails checking how much of the problem has been solved so far and deciding what part of the problem needs to be solved next. That will inform the design of the next iteration.

Stage 2: Design a solution involves deciding on the next minimum viable solution that will be released. This is an opportunity to add functionality or improve existing functionality in response to how the system is being used, what users are asking for, and what is necessary to keep the system running well. An RFI may not be necessary if the same development

partner and technology is going to be used. Again, a small number of use cases will be defined for the iteration.

Stage 3: Develop the solution will be an opportunity to review the development approach, but it will not need to change if it has been effective. Likewise, it will not be necessary to select another developer, if the developer has done a good job. Parts of the RFP will still be useful to get a quotation for the next cycle of development, but it is unlikely that a full RFP will be required for each iteration.

Stage 4: Implement will necessitate communicating about the new functionality(ies). The communication plan developed in the first iteration can be modified to address these changes. Likewise, the implementation plan and the support team will be based on what has been done in the first iteration.

Stage 5: Evaluate now entails a new review of the overall solution with additional functionality. The same measures that were used in previous iterations should be applied. This way the improvements to the system over time will be recorded and lingering problems will become clearer. Identifying areas where measures/fixes are not improving the system will inform the next iteration of the cycle.



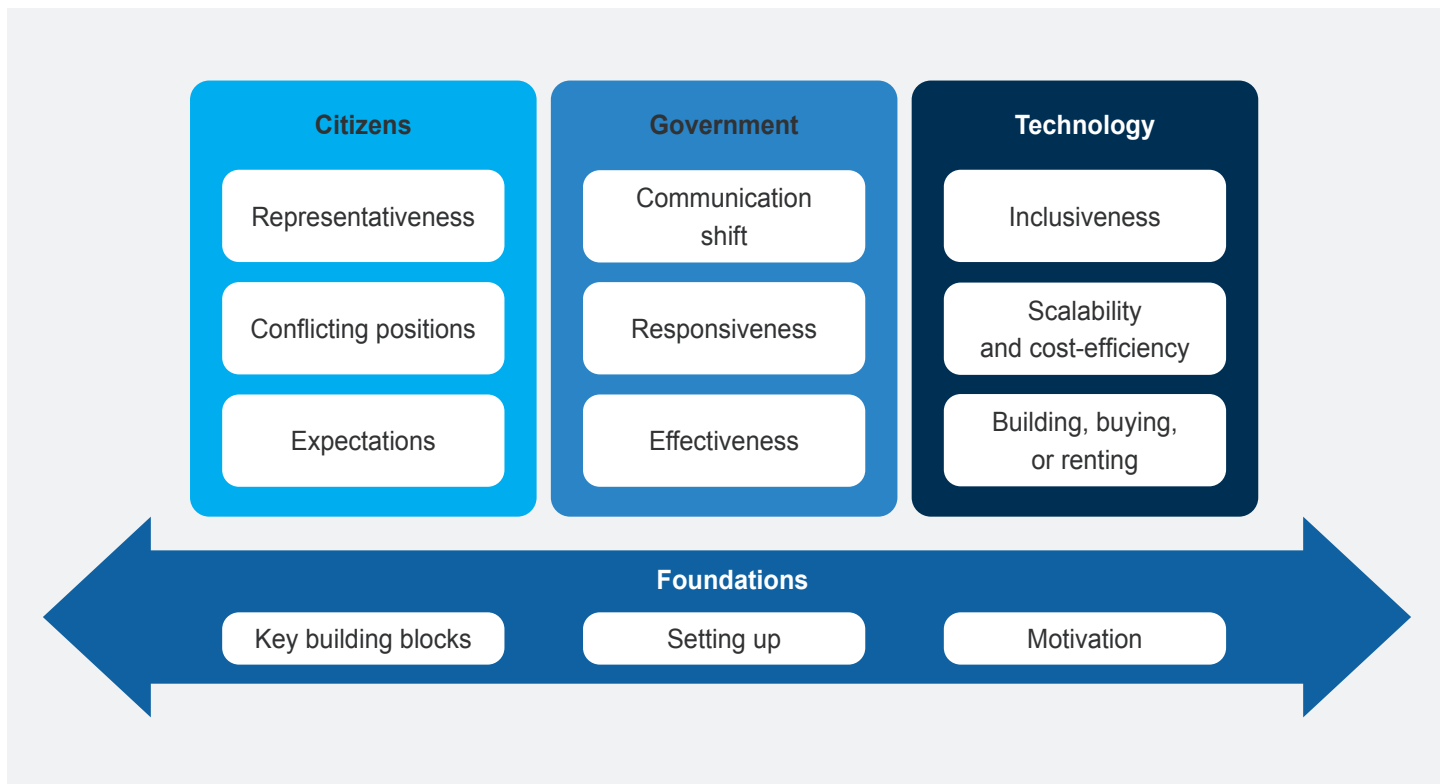
Key Issues for Successful CivicTech

5.1 Introduction

This chapter will focus on the several key issues that policy makers face in designing, developing, and operating CivicTech approaches. Considering the diversity of contexts and goals, tools available, and the possible models to choose from, senior public governance officials are confronted with different policy questions that emerge and various possible paths to be followed. Issues to consider here include how to ensure an inclusive representativeness of participants; how to upgrade the required communication with citizens and secure responsiveness; which technology to embrace; and how to guarantee scalability and cost-effectiveness. The capacity of policy makers to adequately navigate these different key issues and the answers/agreements they reach will be critical to secure coherent and sustainable digital tools for citizen engagement.

Four categories can be considered having in mind the diversity of questions that can emerge – see Figure 5. A first one focuses on issues that entail the kind of relationship to be established with citizens, providing particular attention to questions such as the representativeness and managing expectation on the CivicTech approach. A second one concentrates on questions that determine the government approach to be followed, specifically how to guarantee responsiveness and effectiveness. The third one is directed to the technology to be used, namely its scalability and cost-efficiency. A fourth cross-cutting category centers on CivicTech foundations that can assure sustainability, such as the skills, talents, and culture in place, the required legal and regulatory framework, and/or the required technical infrastructure.

FIGURE 5 - Key Issues of CivicTech



Source: Authors.

The current chapter will address each of the dimensions displayed in Figure 5, presenting for each of the key issues a clear identification of the topics being discussed, data and country experiences that can illustrate them, as well as possible policy approaches to address them.

5.2 Citizens

5.2.1 How to Ensure the Representativeness of Participants and an Inclusive CivicTech Approach

The levels of representation and the inclusive approach to be adopted are among the critical challenges government officials and World Bank task teams face when embracing CivicTech activities. The lack of capacity to ensure that no one is left behind and to secure the proper representativeness of the policy mechanism will certainly undermine the legitimacy of the civic engagement model followed. Key issues to consider are:

1. How to reach out to every interested party, reflecting the diversity of the society. Since there is typically a strong

link between socioeconomic levels and the capacity and willingness to participate, reinforced by the access to digital technologies, it is important to consider how to avoid overrepresentation of the more qualified and interested voices in society.

2. Access and use of the internet reflects the social and economic imbalances of the society, namely in terms of gender equity,²⁵ so how can CivicTech overcome this handicap?
3. How can the involvement of different stakeholders such as the private sector, academia, or NGOs be secured in a transparent and balanced way?
4. How to reconcile individual and collective representation, securing a good balance of the different voices to be heard.

Diverse mechanisms can be adopted to tackle these different challenges and develop an effective, representative, and inclusive CivicTech approach. Box 11 below presents an example of how these issues were addressed in a project.



> > >

BOX 11 - Participatory Mechanisms to Complement CivicTech in Nigeria

The World Bank supported Kaduna State in Nigeria to introduce a mobile app – CitiFeed – that allows citizens to identify nearby public infrastructure projects via GPS coordinates and to submit comments with photos. With a smartphone, users can provide feedback on service availability and quality to make government investment more responsive to citizens.

But, the lack of mobile internet coverage could discourage the use of this app, so they adopted other participatory mechanisms such as town halls, radio talk shows, and a toll-free call center to maximize citizen's participation. Such a complementary approach is useful to increase the representativeness of participants through addressing challenges that vulnerable groups have while accessing CivicTech solutions.

Source: World Bank, 2022.

A clear definition of the audience is fundamental to frame the type of CivicTech mechanism to be embraced. The policy maker should be able to clearly identify the audience and promote a balanced representation, for instance by gender, ethnicity, sexual orientation, disability, religion, language, economic status, marital status, or health status. A collaborative design of CivicTech projects, consulting with and engaging different user profiles, is an important requisite to guarantee the representativeness of the initiatives to be undertaken. The use of outreach campaigns that can inform and incentivize the participation of the audience in the citizen engagement phase is also critical for the success of the CivicTech initiative.

But since leaving no one behind should be a core priority, CivicTech projects should not be limited to digital mechanisms of participation and engagement. Omnichannel approaches that can combine online, app-based, face-to-face, and

telephone mechanisms, allowing the use of diverse channels as alternatives, are fundamental to ensure that less digitally included segments of the population can also be involved in consultations and, engage in collaborative processes – see Box 11. The user-centricity of the platforms to be adopted, through simple usability and plain language, can also contribute decisively to guarantee the inclusiveness of the CivicTech approach.

5.2.2 How to Manage Conflicting Positions Among Citizens

The initial optimism about the ability of the digital transformation to expand democracy and improve its maturity has given way to some digital skepticism. For instance, instead of being enablers and promoters of democracy as they were generally considered in the beginning of the Arab Spring, social media

are frequently used as mechanisms to manipulate public opinion, weakening democracies and enabling the rise of populisms. Proliferation of information and the difficulty of traditional mediators and gatekeepers to do their job (e.g., journalism) are contributing to increasingly polarized public opinions. Algorithm-driven information consumption is leading to a reinforcement of existing beliefs, as opposed to the initial expectation that the emerging digital world would generate more tolerance through exposure to different ideas and diverse world views.

These trends tend to support the creation of digital tribes inhabiting social and economic “bubbles” that facilitate the emergence of polarized public opinions, where moderation and openness to discuss and compromise is gradually replaced by radical political standings. Given this trend, how will the system avoid online engagement mechanisms being hijacked by tribal dynamics among the participants? How will it ensure that users navigate in a digital context where algorithms of social media, for instance, tend to favor disagreement and heated discussion instead of compromise, concession, and cooperation?

The capacity of governments to engage different civil society partners to mobilize diverse publics is critical to manage conflicting positions in CivicTech initiatives. Engaging and partnering with existing communities, associations, or forums that support the generation of joint ownership and shared responsibility towards the CivicTech mechanism being used, should be an asset for the creation of trust among the different stakeholders. Youth communities, political movements, and neighborhood associations are some of the stakeholders that need to be mobilized and engaged in this process. This capacity for community building, supported by high standards of transparency and accountability, is essential for producing a civic engagement culture across the CivicTech audience, avoiding the creation of unbearable gaps among the participants that typically would undermine the citizen engagement initiative.

The use of deliberative democracy approaches supported by digital technologies can also be considered as an important

mechanism to overcome deep conflicting positions. Bringing together citizens that can represent different communities and various points of view, deliberative democracy practices can facilitate the generation of agreements on procedures, actions, or policies for the generation of public good (Britannia 2022; OECD 2021).

5.2.3 How to Manage Citizens' Expectations

In a context where many mechanisms exist that secure interaction and allow the provision of feedback, managing the expectations of citizens regarding their provided inputs is one of the critical challenges governments face. Setting up models and platforms to collect citizen inputs, such as service delivery feedback mechanisms or public consultations, is an important step for citizen engagement. But taking the full benefit of the received inputs, and being able to really integrate them in the policy making or service design processes, requires substantial efforts from the government entities. Frequently, due to the lack of follow-up communication with citizens, problems emerge from the lack of accountability for the outcomes of the consultation processes. The legitimate expectations from the participants who dedicated their time providing service delivery feedback or engaging in a public consultation process end up not being met.

In order not to dismiss the valid expectations of citizens, clarity on the process of integrating the feedback received is critical. CivicTech mechanisms should explain to users from the start how their inputs will be treated – when, by whom, and through which mechanisms. It is also important to assure citizens that, in case their inputs cannot be properly integrated or considered, they will receive a plain and whenever possible personalized response on the reasons that supported this decision. Citizen engagement initiatives should not end with the collection of inputs by the stakeholders. On the contrary, this should be only a first step on the collaborative journey. Transparency is required during the entire lifecycle of the engagement process, making sure that governments are accountable for acting on the feedback received.

Tips for dealing with citizen issues

- Clearly define the stakeholders in any CivicTech solution.
- Use multiple channels to engage with stakeholders to ensure inclusiveness.
- Engage existing communities and organizations.
- Use deliberative democracy approaches to reduce conflict.
- Manage citizen expectations with clear information about the process.

5.3 Government

5.3.1 How CivicTech Changes Communication Between the Government and Citizens

The digital transformation has definitely changed the communication mechanisms, objectives, and processes between governments and their citizens. Coming from an era of letters and paper forms, countries are progressively enhancing digital to embrace new models of communication with clear benefits in terms of immediacy, transparency, and even informality. Social media and its culture provide a good example of the shift underway. Based on their digital world experience, citizens increasingly expect governments to respond very efficiently to their inquiries, inputs, and demands. Public consultation and engagement processes supported by digital technologies are not exempt from this social media culture that privileges informality, immediacy, simplicity, and interactivity, creating a challenge for government to meet today's citizens' expectations.

Governments are now required to bring to the digital world administrative information, consultation, and engagement procedures that were designed with analog and paper-based thinking – see Box 12. Formal and bureaucratic language is now considered inadequate for clarity and simplicity, as well as the verticality of some legacy administrative processes. But how does one avoid digitalizing the existing bureaucracy? How does one avoid simply making electronic what was previously analog, missing the opportunity to really transform the relationship between government and its constituencies? It is critical to recognize the different natures of CivicTech *service-driven* approaches and CivicTech *policy-driven* approaches. The former is mostly administrative, not requiring high level supervision and commitment, having in this sense fewer associated risks. But how can one identify the line of separation between the two approaches? How can one avoid the risk of dragging the administration into political discussions in the case of policy-driven approaches?

> > >

BOX 12 - Online Petitions System in Scotland

Online petition is a representative example of changing the way of communication between the government and citizens from analog and offline to digital and online. It allows citizens to submit their opinion via the app or system anywhere and anytime, without visiting offices. They can also get the notification of status and result through the online systems.

In Scotland, any person or organization can submit a petition to the Parliament using the [online petitions system](#). The system provides easy and clear steps to proceed with the petition, so citizens only need to enter a topic, summary, previous action taken, background, and personal information. Good and bad examples of each step help citizens to have better understanding of how to enter information. Anyone can see the other petitions' content and status, whether they are in the collecting signatures phase or under consideration by the Citizen Participation and Public Petitions Committee.

Source: <https://petitions.parliament.scot/>

Planning and testing are critical in order to choose the right mechanisms of engagement, enabling developers and project managers to better estimate the effort to be mobilized. This preparation and planning stage of a CivicTech initiative should be used to consider the approach to be employed, considering not only the desired outcome, such as substantial participation by the community, but also the capacity of the public entity to efficiently manage the engagement process, for instance responding to questions and comments from the citizens and openly incorporating the received inputs. In this regard, reinforcing the engagement capacities of civil servants to be involved is a central premise, in addition to communicating across the civil service that engagement with citizens requires concrete but affordable efforts and costs.

Having in mind the greater complexity and risks associated with policy-driven engagement mechanisms, public officials should consider prioritizing service-driven goals. This means that, more than starting by discussing broad policies, embracing a discussion based on existing or forthcoming services can be more efficient. This would avoid public entities being dragged unnecessarily into complex political discussions that can undermine the spirit of the CivicTech initiative. A service-by-default mindset, prioritizing from start the benefits of involving citizens in service design, development, delivery and monitoring, should be incentivized since policy-driven CivicTech approaches require a more complex and demanding engagement.

5.3.2 How to Increase the Responsiveness of Government Through CivicTech Approaches

As digital technologies increasingly become the default modes of dialogue between governments and their citizens, the public sectors around the world try to quickly adapt to new expectations on responsiveness. The immediacy of communication and the possibility of doing it without major intermediaries means that civil servants cannot hide behind bureaucratic walls any more. But how can one secure effective

responsiveness to all the demands and inquiries received as a result of different and easily accessible digital channels? Considering that the lack of response to citizens requests is increasingly unacceptable, governments are required to allocate additional resources to manage their interactions with citizens.

Analog responses from the administration to citizens tended to be characterized by bureaucratic and administrative language. Citizens frequently need to have high levels of literacy and proper knowledge of public law to be able to understand what the administration is really communicating to them. This kind of bureaucratic and non-plain language approach is frequently brought to the digital world, demonstrating that some administrations still lack the competencies to communicate in the information age. Non-multilingual communication with citizens also frequently represents an obstacle to the effective engagement of different segments of the population. But how can efficient, plain and multilingual communication with citizens be assured? How can the right competencies in the public sector that would embed consultation and engagement in government processes be secured and then managed in a coherent and sustainable way? Box 13 below provides some examples of addressing issues regarding plain language.



> > >

BOX 13 - Plain Language in Colombia, Peru and the United States of America

In Colombia, a guidebook for the use of plain language by civil servants was developed in 2015. The guidebook not only defines the concept of plain language but also presents very concrete steps on how to write using plain language, starting with the need of organizing the ideas, concrete indications on how to write the document, as well as the approach to revise and validate it (DNP 2015).

In Peru, a Judicial Manual of clear language, accessible to citizens, was designed in 2014 to be applied as a work tool in the training and in the day-to-day interactions of judges and judicial assistants for improved communication with citizens. The objective of the manual is also to develop better access to justice for citizens through the effective understanding of the messages that judges give and to improve the existing guidance through the judicial processes (Poder Judicial 2014)

In the United States, the Plain Writing Act of 2010 was signed into law on October 13, 2010. The law requires that federal agencies use clear government communication that the public can understand and use. The official guidelines for the Plain Writing Act of 2010 were developed to help public officers and their public sector organizations to write clearly, so users can find what they need, understand what they find, and use what they find to meet their needs. (GSA 2022).

The first step for administrations to bring their interactions with citizens to the digital world is to avoid the transfer of analog responsiveness to digital modes. The models of response and interactions with citizens nowadays require some deep rethinking in order to be adapted to the paradigms of simplicity and efficiency. Administrations should strengthen their skills to be able to really listen and be able to learn from citizens in order to secure responsiveness. Civil servants' digital skills are in this sense a priority in order to secure their capacity to fully work in the digital age.²⁶ An engagement culture needs to be promoted across different sectors and levels of government, with high levels of political support and commitment.

Institutional and technological design issues can also be determinants favoring government responsiveness. An institutional design that is user-friendly and efficient has an important role in enhancing government officials' ability to respond to citizens' comments and demands. The proper engagement of the users in the design of these solutions is then critical to secure their usability and effectiveness. From a technological perspective, more than the front-end technology solution being used, such as SMS (text-messaging) or website, it is frequently the back-office task management solution that is determinant, assisting government officials to process and handle the complaints inputs received using responsive-driven defined workflows. This improved responsiveness from government is able to motivate citizens' participation, creating a virtuous circle motivating citizens' participation – see also section 5.5.3.

Some important technologies and approaches should also be mobilized to support the responsiveness of the administration. Always using plain language, the administration should constantly develop Frequently Asked Questions (FAQs) and deploy call centers to support CivicTech initiatives. More advanced models such as chatbots can also be mobilized, allowing citizens to more quickly see their questions answered for engaged participation in the public sphere. Today, multilingual communication with citizens is also a requisite. The combination of automatic translation and human review for written communication with citizens can be increasingly obtained without representing significant additional financial and human effort to the administration.

5.3.3 How to Assess the Effectiveness of CivicTech

Measuring the effectiveness of CivicTech approaches is one of the challenges governments regularly face. Beyond public communication that underlines the benefits of citizen engagement and the effective uptake of the different initiatives, what monitoring mechanisms can be used? What can be measured? In addition, how will expectations be managed and overstatements avoided? How can stakeholders ensure that the CivicTech tool developed is not just a trendy and fashionable approach to policy making or service design, but an efficient and useful policy instrument to capture inputs from citizens?

In order to manage expectations and avoid overstatements regarding the results of civic engagement, it is critical in the planning phase to consider what can be expected and what can be considered a good policy outcome from the CivicTech engagement process. This initial exercise will support the policy actors to focus on the concrete objectives of the CivicTech initiative. Communicating this exercise will raise awareness on what can or cannot be expected among the different interested parties.

Distinguishing between activities, outputs, outcomes, and impacts is also a fundamental requisite to best access the effectiveness of CivicTech. In brief, note the following:

- **Activities:** the action or work developed – for example, working on a CivicTech platform.
- **Outputs:** the products and services that result from the activities such as a CivicTech Platform.

- **Outcomes:** the short- and medium-term effects of these products and services – for example, the levels of participation on the CivicTech platform and how the results were reflected on a given service or policy.
- **Impacts:** positive and negative, direct or indirect long-term effects of the undertaken policy – for example, increased citizen satisfaction towards the service or policy and improved trust in the public sector.

Additionally, the involvement of different stakeholders in the definition of measurement and monitoring mechanisms can contribute to better alignment with the community demand for the CivicTech initiative. It would help to manage expectations, improve the ownership regarding the initiative being undertaken and foster a common responsibility towards its outputs, outcomes, and impacts.

Tips for tackling government issues:

- Begin with service-driven CivicTech interventions to avoid the complexity of policy-driven interventions.
- Assess the capacity of the public entity to manage the engagement.
- Make use of plain language and multi-lingual communication.
- Ensure that back-office processes exist to deal effectively with citizen feedback.
- Plan how to measure the success of CivicTech as part of the design process.

5.4 Technology

5.4.1 Which Technology Infrastructure for Inclusiveness?

Although there is impressive progress on access to the internet by the population in different regions, this prerequisite for inclusive CivicTech approaches cannot be taken for granted. The International Telecommunications Union (ITU) estimates that 63 percent of the world's population was using the internet in 2021 (ITU 2021) and ninety-six percent of the non-internet users live in developing countries. This means that significant segments of the world's population are still not part of the digital age. Issues of lack of connectivity, weak development of the ICT market, high access costs, and low levels of digital literacy are some of the contextual factors that explain this digital gap. So, how can governments ensure that no one is left behind in citizen engagement campaigns? And what

are the limits of government intervention to secure inclusive technology infrastructure to enable citizen engagement?

More governments are enabling policies and building infrastructure to increase accessibility to all constituents. However, there are CivicTech tools that do not require broadband access, smartphones, or high technology. Many low tech/low code options can be implemented in these contexts. Since many of the obstacles to connectivity require broad-based policy making and are beyond the CivicTech scope, practitioners have to adapt citizen engagement approaches to deal with the contextual constraints, always maximizing the inclusiveness and sustainability of the initiatives to be undertaken.

To secure access, governments are more often moving to omnichannel approaches for access to CivicTech initiatives. There is, for example, evidence of uneven use of 311 services across race, education, and income. Hispanics' use of the Boston 311 system was reduced when it moved from call centers to the internet and smartphones. Poorer neighborhoods are less likely to use 311 services (Clark et al. 2013), although in the city of Tallahassee, Florida, minority groups were more likely to use 311 service requests to report power service problems post-Hurricane Michael in 2018 (Xu and Tang 2020). These researchers argue that, provided multiple channels are used, the 311 system can improve equity in service delivery. Mobile apps also facilitate access and can reduce bias because of their widespread use (Hartman, 2019). As a result, the combination of online, telephone, face-to-face, or other analogue approaches is critical to include all segments of the population. Improving access to the citizen engagement initiatives can also be achieved by partnering with existing networks from the public, private, or civil society sectors such as public libraries, post office stations, youth forums, or other community spaces.

5.4.2 What Considerations Inform Selection of Technological Approach?

Choosing the right technological approach is a core decision when planning and designing CivicTech initiatives. Since there are no one-size-fits-all solutions, the technological model to be followed should combine the needs of the CivicTech promoter, the capacity and willingness of its potential users, and diverse contextual factors such as the availability of digital infrastructures or the legal and regulatory framework. It is important to determine how to ensure that the best approach is being adopted, bearing in mind the different variables to be considered, and how to learn from others and avoid

developing solutions that potentially already exist and could be repurposed.

The diversity of technological solutions available requires CivicTech promoters to consider principles that can help them in the selection process. The following may prove useful:

- **Simple by default:** Solutions should be as simple as possible. If a basic technology approach responds to the needs of the CivicTech initiative, more complex alternatives should be avoided.
- **Open by default:** The use of open source and open data reinforces the accountability of the process, contributing to increase trust among the participants.
- **Mobile by default:** Access through smartphones or simpler mobile phones (through SMS technology) increases the capacity to reach different segments of the population.
- **Inclusion by default:** The use of selective omnichannel delivery, plain language and, accessibility to citizens with special needs²⁷ increases the universality of the adopted CivicTech technological solutions.
- **Reusability as a priority:** The possibility of reusing the adopted solution(s) in future contexts reinforces the sustainability of the human and financial efforts to be made.

Although not exhaustive, the principles stated above can provide policy makers and implementers with good guidance on how to secure the scalability, cost-effectiveness and, most importantly the sustainability of the CivicTech solutions to be achieved.

> > >

BOX 14 - Chatbots for Service Delivery Monitoring: CivicTech Pilot in Madagascar

The CivicTech pilot launched in 2019 in Madagascar supported the development of Facebook chatbot for third-party and citizen monitoring of service delivery operations for the Madagascar Public Sector Performance Project. Identifying suitable and sustainable CivicTech solution for the pilot was critical for the project team, such as deciding whether to use the existing open source solution or develop a customized solution.

The project team decided to adopt the Facebook Messenger chatbot as a CivicTech tool after considering several factors: types of communication and interaction needed, built-in chatbot functions, cost and timeframe, familiarity of potential users, and uptake of applications. Understanding the country context and users' background is important to enable designing suitable and sustainable CivicTech approaches.

This chatbot solutions enabled citizens who were using Facebook to monitor public works in their area by allowing users to receive information about public works projects, submit information about the status of public works, report anonymously potential irregularities, and invite other Facebook friends to join the monitoring efforts (World Bank 2020).

5.4.3 Building, Buying, Renting, or Repurposing CivicTech Solutions

One of the most challenging questions managers working in a digital economy context face is, “*what is the right investment solution to be adopted in a fast-changing and innovation-driven digital technology sector?*” In line with section 4.3.1 above, choosing a development approach is a hard decision. Should one buy, build, or rent a CivicTech solution?

Buying a solution typically involves the benefit of having a ready-to-use solution with all the technical support associated. But it can also lead to high costs in the medium- and long term without significant internal knowledge of development, leading to technical dependency and even vendor-locked situations.

Building solutions traditionally requires a stronger investment in internal skills, increasing the short and medium-term costs. It also implies assuming a bigger effort and risk of competing with existing solutions in the market owned by private sector stakeholders with typically deep know-how, stronger experience and larger resources. But internal development brings benefits such as expanding internal competences of the work force, improved parametrization responding to specific needs and the important ownership of the developed product.

The option of renting solutions is an emerging one in a context where platform-as-a-service and software- as-a-service are becoming increasingly mainstreamed due to cloud computing. This kind of approach means that clients are not required to make big investments from the start and can benefit from advanced solutions available on the market. Nevertheless, some of the inconveniences associated with renting are linked

with ongoing operational costs that can become heavy in the long-term, as well as limited internal capacity development.

The solution involving repurposing is based on redeploying existing open-source software for free. Beyond potentially lowering the costs and time for governments to deploy their CivicTech solutions, this approach allows governments to use software that already benefited from multiple testing and iterations. This approach also has the advantage of allowing governments to contribute to community-based public goods by supporting further code development.

There is no one solution that can be recommended for the diversity of contexts and needs that CivicTech addresses, although the repurposing approach presents particularly desirable benefits when considered, in light of the potential cost savings and contribution to the development of public goods. In this sense, a detailed cost analysis is critical, estimating current and futures needs, the applicability of the technology, and the existence of internal knowledge and skills to manage it. This short-, medium-, and long-term analysis of internal demand is necessary to understand the dimension and type of investment to be made. Learning from the experience of others is also fundamental for improved maturity when embracing CivicTech initiatives. Learning from the experience of different levels and sectors of government as well as peer governments from other countries can enable governments to leapfrog along the learning curve and support more sustainable and resilient approaches from the start. It avoids reinventing a wheel that is probably already being used by peers with similar needs.

Tips for addressing technology issues:

- Use multiple channels and low-tech solutions to increase inclusiveness.
- Adopt the principles of simple, open, mobile, inclusive, and reuse by default in technology selection.
- Consider building, buying, renting, and repurposing technology options.
- Undertake detailed short-, medium- and long-term analyses of the costs and benefits.
- Learn from peers in similar contexts who have implemented similar solutions.

5.5 Foundations

5.5.1 What Are the Building Blocks for Successful CivicTech Implementation?

Public decision-makers around the globe inclined to embrace CivicTech approaches ought to consider if certain policy foundations need to be in place in order to secure successful CivicTech implementation. Considering the different administrative cultures, levels of digital development and policy drivers to be found in diverse countries, what are the CivicTech foundations that need to be in place?

Is there a minimum level of access to the internet or digital literacy among the population above which CivicTech approaches should be considered? What are the competencies and skills required from public officials to lead CivicTech approaches? And what are the minimum technical infrastructures to run CivicTech approaches? Is there a digital, openness, and participatory mindset in the administration that supports these kinds of approaches? Is the legal and regulatory framework, namely in terms of access to information, personal data protection and cybersecurity, sufficiently updated to embrace CivicTech policy models?

The ITU estimates that 63 per cent of the world's population was using the internet in 2021. However, this leaves 2.9 billion people still offline. On the other hand, insufficient digital skills are an obstacle to fully benefit and engage in our progressively digitally transformed societies. Also, according to the ITU, in

40 per cent of the 76 countries for which data are available, less than 40 per cent of individuals reported having carried out one of the activities that comprise basic skills, such as sending an e-mail with an attachment or copying/moving a file or a folder, in the previous three months (ITU, 2021). Access to the internet and digital skills are, in this sense, critical dimensions to consider on the preparedness of a country or region to embrace CivicTech initiatives.

Although the minimum prerequisites for a successful CivicTech approach can vary substantially depending on different contextual variables, an assessment framework of the different foundations is needed to ensure that the solutions to be embraced can be adapted to be responsive to the environment. The approaches to be adopted should bear in mind the maturity levels of the different foundations in place to secure sustainability of the initiative – see Box 15 below. The assessment should be considered during the design of the technological solution. If the respective levels of digital literacy of the population and competences of the public officials are low, the CivicTech initiative should be particularly simple and inclusive in order to leave no one behind. If the legal and regulatory framework is not sufficiently developed or updated, the CivicTech initiative should adapt its way of working and outreach to this limitation. Where minimum requisites for the deployment of CivicTech approaches are lacking, a consistent effort should be made by policy makers and implementers to adapt the CivicTech initiative to the contextual reality.

> > >

BOX 15 - Murcia's Citizen App "TuMurcia" in Spain

TuMurcia is a citizen application in Murcia, Spain, that enables citizens to communicate with the Municipality. Citizens can suggest ideas, notify imperfections in their neighborhood, and provide feedback on municipal strategies and regulations via their mobile devices and computers.

This online CivicTech tool has been implemented successfully while ensuring inclusiveness based on the Tallin Declaration on eGovernment principles that are acting as building blocks: (1) the process is open to all and assistance in using app is available through the direct chat or telephone call; (2) the app is straightforward and easy to understand with clear instructions; (3) the municipality has enough network of libraries with computers and internet access for people who do not have mobile devices; and (4) people can directly interact with the local administration for participation and engagement.

Source: www.usercentricities.eu.



5.5.2 How Are Building Blocks of Fundamentals Set Up to Adopt and Effectively Implement Sustainable CivicTech?

Developing some of the building blocks in order to provide CivicTech approaches with the right pillars is one of the foundational challenges governments face. Investing in strengthening these basic conditions for sound citizen engagement is an important step for effective, inclusive and sustainable policy development in the digital age. However, there is not a one-size fits all approach. Some good practices applied in a specific country would not apply to other countries. Diverse contextual factors determine different solutions to be embraced.

Reinforcing CivicTech building blocks on different fronts requires prioritizing policy actions that can have a widespread effect across the different sectors and levels of government. Although not exhaustive, the following policy work streams can be highlighted:

- **Whole-of-government approaches:** CivicTech should be properly reflected in different components of the whole-of-government approach, benefiting from high level political support, properly articulated in national and sub-national GovTech strategies, being one of the priorities of the public sector organization coordinating GovTech policy, and adopted as a fundamental requisite in policy levers such as pre-evaluation of ICT investments or GovTech procurement.

- **Engagement by default initiatives:** More than being considered a trendy policy mechanism to create value on top of existing policy priorities, CivicTech should be properly embedded from the start in different initiatives as an imperative for stronger citizen engagement and reinforced capacity to respond to constituents' needs.
- **Skills and talent:** Government officials and civil society should benefit from capacity building that can create the basis for the development of a CivicTech culture capable of securing coherence and sustainability of citizen engagement.
- **Community-building:** Engaging the ecosystem of CivicTech stakeholders towards community development is essential to boost collaboration and create a sense of joint ownership and responsibility toward CivicTech initiatives.

5.5.3 How to Motivate Citizens' Participation

Governments frequently develop advanced CivicTech approaches that do not result in significant use by the community. Although well intentioned and expecting the involvement of citizens, many citizen engagement initiatives do not result in a substantial uptake. Public communication approaches certainly need to be reinforced, and stronger investment should be made toward diminishing the different gaps that separate public institutions from their citizens. But what kind of approaches can be taken? And what kind of mechanisms may be mobilized to manage expectations and improve trust?

Effective engagement of the community in the public sphere is increasingly understood as a fundamental requisite for sound CivicTech approaches. This entails moving from ad hoc approaches to continuous prioritization, and sustained efforts of the public sector to involve the citizens in the development of its different policies, processes, and services. Governments should understand the users' needs and avoid building solutions that do not respond to effective demand – see Box 16 below. Embedding this imperative in the fabric of government operations is one of the challenges that public officials face. Investing in a CivicTech culture is, in this regard, a central priority which governments are required to embrace. In line with section 4.4.1 above on building a stakeholder communication plan, governments should consider:

- Regular and coordinated statements from politicians and high-level officials highlighting the civic engagement process underway.
- Public relations activities involving the ecosystem of public, private, academic, and civil society stakeholders to raise awareness and positively influence citizens' participation.
- Campaigns through traditional media (radios, newspapers, television) and social media (ads) inviting citizens to be engaged and effectively participate.

> > >

BOX 16 - Addressing Local Issues Based on ICT and Citizen Engagement in the Republic of Korea

The Ministry of Interior and Safety in the Republic of Korea has implemented a project to address local problems that citizens were facing in their daily life by adopting digital technologies with citizens and local businesses since 2018. For example, Busan Metropolitan city developed the dental health management system for local elementary students to create their oral health database and provide customized health information. In the Jeju Province, a service to check the real-time locations of school buses was launched for students in special schools through participation of teachers and parents.

The entire processes of this project, from identifying challenges to discussing solutions, were initiated by citizens since they have better understanding of local issues and context. Subnational governments, local businesses, and the Korea Local Information Research and Development Institute are supporting this process by sharing expertise or developing digital solutions. This project has contributed to increasing local governments' responsiveness through adopting a co-creation approach. As citizens play critical roles in addressing local issues, local governments have to respond more proactively and in advance.

Source: <https://mois.go.kr/>.

Tips for working on foundational issues:

- Assess the digital skills of citizens and public officials using one of the many existing assessment frameworks before designing CivicTech solutions.
- Assess the legal and regulatory frameworks needed as part of the design of any CivicTech design.
- Use a whole-of-government approach to embed digital transformation in government.
- Embed engagement in all government processes.
- Ensure that there is a demand for the CivicTech solution before building it to avoid poor uptake.



Conclusion

Although governments have increased their use of digital tools to deliver services and interact with the people they govern, new pressures have arisen to both get better at digital provisions and to change the nature of those provisions. On the one hand, people have expectations that are formed by their interactions with the private sector for high-tech, responsive, and slick digital tools and interactions which are driving a demand for better and more comprehensive e-government. On the other hand, a growing appreciation of governance as a collaborative process between many stakeholders is driving a need for more inclusive, collaborative, and co-created digital solutions. These pressures are driving an interest in CivicTech as a means of improving communication and increasing opportunities for collaboration among stakeholders.

CivicTech provides opportunities for sharing information in ways that are clear and comprehensive in order to create greater understanding and commonality. Technology has the potential to make it easier to reach more people and to provide a wide range of information and digital services at low cost. The provision of relevant information and data in accessible formats is not easy. Governments that wish to have an impact with CivicTech need to first research and understand the access and affordability concerns of citizens, their priority needs, and preferences. Governments also need to have good data sources to be able to share information in appropriate ways, using intermediaries to reach citizens if necessary.

It also offers ways in which stakeholders can voice their opinions and concerns, giving feedback to government in ways that facilitate action and follow-up. CivicTech offers space for collaboration as equal partners in co-creating new services, policies and responses to local concerns. CivicTech can solicit feedback and citizen views, or it can be approached as co-creation with other stakeholders as equal partners. These kinds of engagement can improve trust between citizens and governments, but that depends on many external factors including the environment that surrounds state citizen relationships, the levels of state responsiveness and citizen satisfaction with the outcomes.

This report has identified three levels of CivicTech: (1) openness and transparency; (2) participation and engagement; and (3) collaboration, co-design, co-creation, and co-production that reflect the increasing complexity associated with the various CivicTech capabilities. This report has reviewed the existing literature on CivicTech and presents an overview of how CivicTech is currently being used, describing solutions in each of the three levels. Since CivicTech interventions are not always government-driven, we include examples of applications that have been initiated by the private sector, by non-government organizations and by other bodies. An appendix provides a reference table of different types of applications, their purposes and the range of technologies employed.

The how-to-note has provided a detailed process for the design, development, and evaluation of CivicTech solutions,

drawn from established, successful practices in software development. The process emphasizes the need for deep understanding of the problem to be solved, as well as an iterative approach that allows for low initial investment, early visible results, rapid feedback on the impacts of the system, and immediate adjustments. The process is designed to be accessible to those outside of the information systems profession, giving a simplified glimpse of the tools used in understanding complex technology systems that should be useful to those encountering this challenge for the first time.

Finally, there are some key foundations that need to be in place for CivicTech initiatives to succeed, such as digital infrastructure availability, digital skills of public servants, the legal and regulatory framework. And different contexts warrant diverse policy strategies to address these foundations since there is not a one-size-fits-all approach. Therefore, the technology choices to be made need to consider issues such as different modes of investment and accessibility. Most importantly, governments should have the capacity to embrace whole-of-government approaches and engage the ecosystem of stakeholders to guarantee the sustainability of CivicTech initiatives. There are also issues to be considered around the people that will use the Civic Tech, such as ensuring representativeness of participation, and managing expectations and conflicting positions. For governments, it is important that CivicTech initiatives are supported by responsiveness and effectiveness so as not to undermine citizens' trust.



Key Points for Practitioners

- The three stages of CivicTech framework can be used to understand the types of CivicTech and the requirements to implement each; higher stages involve increasing complexity.
- CivicTech implementation can be understood as a cyclical process that is never complete, but always in a process of being refined. Every CivicTech intervention should therefore be treated as a long-term project that will require ongoing support and development.
- There are five stages in the CivicTech cycle:
 1. It is worth investing time to fully understand each problem, from the perspective of different stakeholders, including what solutions have been tried in the past and why they failed. Develop a theory as to why the problem situation has arisen and how your intervention will change it.
 2. Solutions are systemic and technology is only a small part. Give appropriate attention to everything other than the technology – the communication, policy frameworks, the operational processes, the support mechanisms and the measurement and reporting.
 3. Look for optimal technology solutions that reuse or build on existing technology but take advice from trusted technology partners on the capabilities and effort involved.
 4. When implementing, make small changes and observe whether your theory is correct and whether there are any unintended consequences before investing more resources.
 5. Examine the outcomes and decide on the next incremental.
- CivicTech is more likely to succeed if attention is paid to the following issues:
 - Work to ensure that interventions are inclusive, that conflicting positions are negotiated and that citizen expectations are managed.
 - Expect the relationship between citizens and government to change, ensure government is responsive transparent and publish measures of the impact of interventions.
 - Aim for solutions that are simple, open, mobile, inclusive, and reusable, looking for optimal technology solutions that reuse or build on existing solutions.
 - Develop foundational policies, infrastructure and skills where necessary, taking a whole of government perspective and building community engagement.

CivicTech solutions inherently are required to evolve and are unlikely to ever be complete and final. Because of the rapid changes in technology, any solution developed is going to have to change on an ongoing basis, and solutions will require ongoing financing for sustainability.



Notes

1. Governance is the process through which state and nonstate actors interact to design and implement policies within a given set of formal and informal rules that shape and are shaped by power. The World Development Report defines power as the ability of groups and individuals to make others act in the interest of those groups and individuals and to bring about specific outcomes (Dahl 1957; Lukes 2005; WDR, 2017).
2. “Social accountability can be defined as an approach towards building accountability that relies on civic engagement, in which it is ordinary citizens and/or civil society organizations who participate directly or indirectly in exacting accountability. 10 Mechanisms of social accountability can be initiated and supported by the state, citizens or both, but very often they are demand-driven and operate from the bottom-up.” In WBG (2004) Social accountability: an Introduction to the Concept and Emerging Practice, available at <https://documents1.worldbank.org/curated/en/327691468779445304/text/310420PAPER0So1ity0SDP0Civic0no1076.txt>.
3. Citizen Engagement (WBG 2022), available at <https://www.worldbank.org/en/topic/citizen-engagement>.
4. The difficulty to collect quality information on CivicTech domains was one of the limitations recognized by the team responsible for the 2020 edition of the GovTech Maturity Index. Nevertheless, the data collection and validation process for the 2022 edition is running as this report is being written. Significant improvements are expected as the information is being jointly validated by country representatives and the GTMI project team.
5. Citizen Engagement (WBG 2022), available at <https://www.worldbank.org/en/topic/citizen-engagement>.
6. Social accountability: an Introduction to the Concept and Emerging Practice (WBG 2004), available at <https://documents1.worldbank.org/curated/en/327691468779445304/text/310420PAPER0So1ity0SDP0Civic0no1076.txt>.
7. Ackerman, John (2005). Social Accountability in the Public Sector: A Conceptual Discussion, available at <https://documents1.worldbank.org/curated/en/514581468134386783/pdf/357330Ackerman.pdf>.
8. Citizen Engagement, (WBG 2022).
9. What is GovTech? (WBG 2022), available at <https://www.worldbank.org/en/programs/govtech/priority-themes>; accessed on July 28, 2022.

10. In the Democratic Republic of Congo, for example, emerging from conflict, citizen trust was very low. The government of the South Kivu Province introduced participatory budgeting, enabling citizens to vote on budget allocations. When citizens saw roads and schools being repaired that they had voted for, tax collection jumped 16-fold, a clear measure of the increased trust in government resulting from open, participatory approaches (Pradhan 2021).
11. Peixoto, Tiago (2013). Does transparency lead to trust? Some evidence on the subject; available at <https://democracyspot.net/2013/06/19/does-transparency-lead-to-trust-some-evidence-on-the-subject>.
12. Grandvoinnet, Helene and Margaret Chasara. 2019. Engaging Citizens in Countries Affected by Fragility, Conflict, and Violence, available at <https://openknowledge.worldbank.org/handle/10986/33451>.
13. Peixoto, Tiago and Tom Steinberg. 2019. Citizen Engagement: Emerging Digital Technologies Create New Risks and Value. Washington, DC: World Bank. <https://openknowledge.worldbank.org/handle/10986/32495>.
14. World Development Report 2016: Digital Dividends. Washington, DC: World Bank. doi:10.1596/978-1-4648-0671-1.
15. Peixoto, T., and J. Fox. 2016. “When Does ICT-Enabled Citizen Voice Lead to Government Responsiveness?” WDR 2016 Background Paper; Washington, DC: World Bank. <https://openknowledge.worldbank.org/handle/10986/23650>.
16. The term “citizen” is used broadly here to include civic stakeholders such as individuals, businesses and civic organizations and others residing in the jurisdiction where government is responsible for their services and or they are responsible for paying taxes.
17. See <https://blogs.worldbank.org/opendata/subnational-data-desks-set-stage-more-efficient-participatory-development>.
18. See https://www.article19.org/data/files/RTI_Principles_Updated_EN.pdf for principles for right to information legislation; and <https://www.rti-rating.org> for an assessment of the quality of the legislation globally.
19. Brazil, Indonesia, Mexico, Norway, Philippines, South Africa, the United Kingdom, and the United States.
20. The Brazilian Institute for Socioeconomic Studies INESC; the Indian Association for the Empowerment of Workers and Peasants MKSS; the Mexican Institute GESOC (Gestión Social y Cooperación); the Open Government Institute, Moldova; Twaweza, Tanzania; Publish What You Pay, Indonesia; the British Transparency and Accountability Initiative; the Revenue Watch Institute from the US; and the International Budget Partnership.
21. See <https://alkags.me/lessons-from-kodi-completing-the-job/>.
22. See <https://openknowledge.worldbank.org/handle/10986/17221?locale-attribute=es> for lessons learned from water and sanitation sector Hackathons and <https://www.worldbank.org/en/news/press-release/2013/04/19/world-bank-awards-three-mobile-developer-teams-for-apps-addressing-sanitation-needs>.

23. If there are competing theories, explain them, who holds them and the evidence that exists for each.
24. PeoplePowered. <https://www.peoplepowered.org/digital-guide-home>.
25. According to the International Telecommunications Union (ITU), in 2019 the proportion of women using the Internet globally was 48 per cent, compared to 58 per cent of men. In relative terms, this means that the global Internet user gap is 17 per cent. In all regions of the world, more men than women are using the Internet. The gap is small in developed countries and large in developing countries, especially least developed countries (LDCs). The proportion of women using the Internet is higher than that of men in only 8 per cent of countries, while gender equality in Internet use is found in just over one-quarter of countries (ITU 2020).
26. The World Bank GovTech Maturity Index highlights that 47 percent of the 198 countries surveyed do not have a strategy to improve digital skills, underlining the importance of further efforts and investments by public sectors worldwide to tackle this skills challenge (WBG 2021). The World Bank report, *Tech Savvy: Advancing GovTech Reforms in Public Administration*, provides sound empirical-based analysis on public sector digital skills and guidance on how to improve competences in a fast-changing technological context.
27. The World Bank estimates that 15 percent of the world's population – one billion persons – have a disability, and 80 percent are living in low and middle-income countries. When designed for such user groups, the deployment of digital technologies can break traditional barriers to communication, interaction, and access to information for persons with disabilities (PWDs) (WBG, 2021). In this regard, the World Bank GovTech initiative developed a World Bank Guidebook for Accessible GovTech, available at <https://thedocs.worldbank.org/en/doc/3fcff7a44bd530a0413e23245ace2f03-0350012021/related/EFI-Insight-Accessible-GovTech-4-1.pdf>.



References

Ackerman, John. 2005. "Social Accountability in the Public Sector: A Conceptual Discussion." <https://documents1.worldbank.org/curated/en/514581468134386783/pdf/357330Ackerman.pdf>

Asamoah, K. 2019. "E-governance in Africa's local governments: Do district assemblies in Ghana optimize the use of websites and social media?" *Electronic Journal of Information Systems in Developing Countries* 85(4): 1–13. <https://doi.org/10.1002/isd2.12082>.

Asher, T., Hollie R. Gilman, and Abigail Anderson. 2021. *Digital Tools for a Responsive Government: A Report for the NYC Civic Engagement Commission*. New York: Columbia University.

Åström, J., Magnus E. Jonsson, and Martin Karlsson. 2017. "Democratic innovations: Reinforcing or changing perceptions of trust?" *International Journal of Public Administration* 40(7): 575–587. <https://doi.org/10.1080/01900692.2016.1162801>.

Baack, S. 2018. "Practically Engaged: The entanglements between data journalism and CivicTech." *Digital Journalism* 6(6): 673–692. <https://doi.org/10.1080/21670811.2017.1375382>.

Backhouse, J., and Soumaya Ben Dhaou (Eds.) (2021). *Simple ways to be smart, United for Smart, Sustainable Cities* (U4SSC). https://www.itu.int/en/publications/Documents/tsb/2021-U4SSC-Simple-ways-to-be-smart/files/downloads/21-00126_U4SSC_Simple-ways-to-be-smart.pdf.

Backhouse, J., and Hlelo Chauke. 2020. "Development Impacts of Free Public Wi-Fi in Johannesburg." In R. Boateng (Ed.). *Handbook of Research on Managing Information Systems in Developing Economies* (pp. 374–395). Hershey, PA: IGI Global. <https://doi.org/10.4018/978-1-7998-2610-1.ch018>.

Baum, C. and Andrea DiMaio. 2001. "Gartner's four phases of e-government model." Available at: <https://www.gartner.com/en/documents/317292>.

Berker, F., Frank Reins, and Helmut Heck. 2018. "Co-creation of a Mobile City District Guide with and for Older Adults." In *Computers Helping People with Special Needs* (pp. 379–382). Klaus Miesenberger and Georgios Kouroupetroglou (eds.). Cham, Switzerland: Springer International Publishing.

Berg, S., Veza Clute-Simon, Rebecca-Lee Freudl, Niklas Rakowski, and Thorsten Thiel. 2021. "Civic Hackathons und der Formwandel der Demokratie." *Politische Vierteljahresschrift* 62: 621–642. <https://doi.org/10.1007/s11615-021-00341-y>.

- Bharosa, N., Federica Marangio, Claudio Petti, and Marijn Janssen. 2021. "Engaging citizens in digital public service innovation ecosystems-insights from the Netherlands and Italy." In *14th International Conference on Theory and Practice of Electronic Governance* (pp. 509-512). Euripidis Loukis, Marie Anne Macadar, Morten Meyerhoff Nielsen, and Mário Peixoto (eds.)
- Botchway, E. A., Ezer O. Yeboah-Boateng, and Titus E. Kwofie. 2016. "Benefits of e-governance implementation in physical infrastructure development at the local government level." In *Electronic Government, an International Journal* 12(4): 395–405. <https://doi.org/10.1504/eg.2016.080441>.
- Code for America. 2017. "Code for America brigades." Retrieved from <http://brigade.codeforamerica.org/brigade/>.
- Coetzee, H., Ina-Mari du Toit, and Marlien Herselman. 2012. "Living Labs in South Africa: An analysis based on five case studies." *eJOV: The Electronic Journal for Virtual Organizations and Networks* 14: 1–29.
- Chatfield, A. T., and Christopher G. Reddick. 2018. "All Hands on Deck to Tweet# Sandy: Networked Governance of Citizen Coproduction in Turbulent Times." *Government Information Quarterly* 35(2): 259–272. <https://doi.org/10.1016/j.giq.2017.09.004>.
- Clarke, R. Y. 2014. *Civic tech fuels U.S. state and local government transformation*. San Ramon, CA: Accela.
- Compagnucci, L., Francesca Spigarelli, José Coelho, and Carlos Duarte. 2021. "Living Labs and user engagement for innovation and sustainability." *Journal of Cleaner Production* 289: 125721. <https://doi.org/10.1016/j.jclepro.2020.125721>.
- da Cruz, N. F., Antonio F. Tavares, Rui Cunha Marques, Susana Jorge, and Luis de Sousa. 2016. "Measuring local government transparency." *Public Management Review* 18(6): 866-893. <https://doi.org/10.1080/14719037.2015.1051572>.
- Dahl, R. A. 1957. "The Concept of Power." *Behavioral Science* 2(3): 201–215. <https://doi.org/10.1002/bs.3830020303>.
- de Paula, D. F., Bianca H. Menezes, and Cristiano C. Araújo. 2014. "Building a quality mobile application: A user-centered study focusing on design thinking, user experience and usability." In *International Conference of Design, User Experience, and Usability* (pp. 313–322). Cham, Switzerland: Springer International Publishing.
- Dener, C., Hubert Nii-Aponsah, Love E. Ghunney, and Kimberly D. Johns 2021. *Govtech Maturity Index: The State of Public Sector Digital Transformation*. International Development in Focus. Washington DC: World Bank. <https://openknowledge.worldbank.org/handle/10986/36233>.
- Departamento Nacional De Planeación. 2015. "Guía de lenguaje claro para servidores públicos de Colombia." Available at: <https://rb.gy/nmm3lj>.
- Dietrich, A. D. 2015. "The role of civic tech communities in PSI reuse and open data policies." Retrieved from <http://www.odhms.org/2015/02/asked-open-data-platform/>.
- DiSalvo, C., and Tom Jenkins. 2017. "Fruit are heavy: a prototype public IoT system to support urban foraging." In *Proceedings of the 2017 Conference on Designing Interactive Systems* (pp. 541–553).

- Eagan, J. L. 2016. "Deliberative democracy." Encyclopedia Britannica. <https://www.britannica.com/topic/deliberative-democracy>.
- European Union. 2019. "Directive (EU) 2019/1024 of the European Parliament and of the Council of 20 June 2019 on open data and the re-use of public sector information." <https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1561563110433&uri=CELEX:32019L1024>.
- Fath-Allah A., Laila Cheikhi, Rafa E. Al-Qutaish, and Ali Idri. 2014. "E-government maturity models: A comparative Study." *International Journal of Software Engineering and Applications* 5(3): 71–91.
- Fedozzi, L. 1998. "Esfera pública e cidadania: A experiência do Orçamento Participativo de Porto Alegre." *Ensaio FEE*. 19(2): 237–256.
- Fraudorfer, M. 2017. "The Open Government Partnership: Mere Smokescreen or New Paradigm?" *Globalizations* 14(4). DOI:10.1080/14747731.2016.1236463.
- Gandía, J. L., Lucía Marrahí, and David Huguet, D. 2016. "Digital transparency and Web 2.0 in Spanish city councils." *Government Information Quarterly* 33(1): 28–39. <https://doi.org/10.1016/j.giq.2015.12.004>.
- Ganuzza, E., and Gianpaolo Baiocchi. 2012. "The power of ambiguity: How participatory budgeting travels the globe." *Journal of Deliberative Democracy* 8(2): .
- General Services Administration (GSA). 2022. "Plain language." Available at plainlanguage.gov.
- Gintova, M. 2019. "Understanding Government Social Media Users: An Analysis of Interactions on Immigration, Refugees and Citizenship Canada Twitter and Facebook." *Government Information Quarterly* 36(4): 101388. <https://doi.org/10.1016/j.giq.2019.06.005>.
- Grandvoinnet, Helene and Margaret Chasara. 2019. *Engaging Citizens in Countries Affected by Fragility, Conflict, and Violence*. Washington, DC : World Bank. Available at: <https://openknowledge.worldbank.org/handle/10986/33451>.
- Gritsenko, D., and Andrey Indukaev. 2021. "Digitalising City Governance in Russia: The Case of the 'Active Citizen' Platform." *Europe - Asia Studies*, 73(6): 1102–1124. <https://doi.org/10.1080/09668136.2021.1946013>.
- Hooli, L., Jussi S. Jauhiainen, and Kristiina Lähde. 2016. "Living labs and knowledge creation in developing countries: Living labs as a tool for socio-economic resilience in Tanzania." *African Journal of Science, Technology, Innovation and Development* 8:1, 61–70, DOI: 10.1080/20421338.2015.1132534.
- Heeks, R. 2002. Information Systems and Developing Countries: Failure, Success, and Local Improvisations, *The Information Society*, 18:101-112. <https://doi.org/10.1080/01972240290075039>
- Hou, Y. 2018. "Understanding the design and implementation of civic technologies in resource-limited public organizations." Doctoral Dissertation. The University of Michigan.

- Huang, C., Wu, X., and Wang, D. 2016. "Crowdsourcing-based urban anomaly prediction system for smart cities." In *International Conference on Information and Knowledge Management, Proceedings 24–28-October 2016*. p. 1969–1972. <https://doi.org/10.1145/2983323.2983886>.
- International Development Association. 2019. IDA19. *Special Theme: Governance and Institutions*. Washington, DC: World Bank Group. <https://documents1.worldbank.org/curated/en/696731563778743629/pdf/IDA19-Second-Replenishment-Meeting-Special-Theme-Governance-and-Institutions.pdf>.
- _____. 2022. *IDA20 - Building Back Better from the Crisis: Toward a Green, Resilient and Inclusive Future*. Washington, DC: World Bank Group. <http://documents.worldbank.org/curated/en/163861645554924417/IDA20-Building-Back-Better-from-the-Crisis-Toward-a-Green-Resilient-and-Inclusive-Future>.
- International Telecommunications Union (ITU). 2020. "The digital gender gap is growing fast in developing countries." Available at <https://itu.foleon.com/itu/measuring-digital-development/gender-gap#>.
- _____. 2021. "2.9 billion people still offline." Available at <https://www.itu.int/en/mediacentre/Pages/PR-2021-11-29-FactsFigures.aspx>.
- _____. 2021. Measuring digital development: Facts and figures 2021. Available at: <https://www.itu.int/en/ITU-D/Statistics/Documents/facts/FactsFigures2021.pdf>.
- Jarke, J. 2019. "Open government for all? Co-creating digital public services for older adults through data walks." *Online Information Review* 43(6): 1003–1020. <https://doi.org/10.1108/OIR-02-2018-0059>.
- Jarke, J., Ulrike Gerhard, and Herbert Kubicek. 2019. "Co-creating digital public services with older citizens: Challenges and opportunities." In David, K., Geihs, K., Lange, M. and Stumme, G. (Hrsg.) *INFORMATIK 2019: 50 Jahre Gesellschaft für Informatik–Informatik für Gesellschaft*. Pp. 51–64). DOI: 10.18420/inf2019_08.
- Kim, H., Ko, Eun-Young, Donghoon Han, Sung-Chul Lee, Simon T. Perrault, Jihee Kim, and Juho Kim. 2019. "Crowdsourcing perspectives on public policy from stakeholders." In *Extended Abstracts of the 2019 CHI Conference on Human Factors in Computing Systems* (pp. 1–6). <https://doi.org/10.1145/3290607.3312769>.
- Lindner, R. and Ulrich Riehm, (2011) "Broadening Participation Through E-Petitions? An Empirical Study of Petitions to the German Parliament." *Policy & Internet* 3(1): 1–23. <https://doi.org/10.2202/1944-2866.1083>.
- Lukes, Steven. 2005. *Power: A Radical Review*. 2nd ed. New York: Palgrave Macmillan.
- Mačiulienė, M., and Aelita Skaržauskienė. 2020. "Building the capacities of civic tech communities through digital data analytics." *Journal of Innovation & Knowledge* 5(4): 244–250.
- Manda, M., and Judy Backhouse. 2016. "Addressing trust, security and privacy concerns in e-government integration, interoperability and information sharing through policy: a case of South Africa." *CONF-IRM 2016 Proceedings*. 67. <https://aisel.aisnet.org/confirm2016/67>.

- May, A., and Ross, T. 2018. "The design of civic technology: factors that influence public participation and impact." *Ergonomics* 61(2): 214–225. <https://doi.org/10.1080/00140139.2017.1349939>.
- McIntosh, L., and Caroline Hardin. 2021. "Do Hackathon Projects Change the World? An Empirical Analysis of GitHub Repositories." In *Proceedings of the 52nd ACM Technical Symposium on Computer Science Education* (pp. 879–885). <https://doi.org/10.1145/3408877.3432435>.
- Medaglia, R., and Demi Zhu. 2017. "Public Deliberation on Government-Managed Social Media: A Study on Weibo Users in China." *Government Information Quarterly* 34(3): 533–544. <https://doi.org/10.1016/j.giq.2017.05.003>.
- Meijer, A., and Marcel Thaens. 2018. "Urban technological innovation: Developing and testing a sociotechnical framework for studying smart city projects." *Urban Affairs Review* 54(2): 363–387. <https://doi.org/10.1177/1078087416670274>.
- Mellon, J., Hollie Russon Gilman, Fredrik M. Sjoberg, and Tiago Peixoto. 2017. "Gender and Political Mobilization Online: Participation and Policy Success on a Global Petitioning Platform." Ash Center Occasional Papers. Ash Center for Democratic Governance and Innovation. Harvard Kennedy School. https://ash.harvard.edu/files/ash/files/gender_and_political_mobilization_online.pdf.
- Milan, S., and Arne Hintz. 2013. "Networked collective action and the institutionalized policy debate: Bringing cyberactivism to the policy arena?" *Policy & Internet* 5(1): 7–26. <https://doi.org/10.1002/poi3.20>.
- Mojapelo, S. M. 2020. "The Internet Access and Use in Public Libraries in Limpopo Province, South Africa." *Public Library Quarterly* 39(3): 265–282. <https://doi.org/10.1080/01616846.2019.1622980>.
- MySociety (2017). mySociety. Retrieved from <https://www.mysociety.org/about/>.
- Nam, C. 2020. "Behind the Interface: Human Moderation for Deliberative Engagement in an eRulemaking Discussion." *Government Information Quarterly* 37(1): 101394. <https://doi.org/10.1016/j.giq.2019.101394>.
- Nolte, A., Irene-Angelica Chounta, and James D. Herbsleb. 2020. "What happens to all these hackathon projects?: Identifying factors to promote hackathon project continuation." *Proceedings of the ACM on Human-Computer Interaction* 4(CSCW2): 1–26.
- Open Government Partnership (OGP). 2011. The open government declaration. Retrieved June 21, 2022, from <http://www.opengovpartnership.org/about/open-government-declaration>.
- Organisation for Economic Co-operation and Development (OECD). 2017. *Trust and Public Policy: How Better Governance Can Help Rebuild Public Trust*. Paris: OECD Publishing. <https://doi.org/10.1787/9789264268920-en>.
- _____. 2020. *Innovative Citizen Participation and New Democratic Institutions: Catching the Deliberative Wave*. Paris: OECD Publishing. <https://doi.org/10.1787/339306da-en>.
- Otioma, C., Ana M. Madureira, and Javier Martinez. 2019. "Spatial analysis of urban digital divide in Kigali, Rwanda." *GeoJournal* 84: 719–741. <https://doi.org/10.1007/s10708-018-9882-3>.

- Paul, A. 2019. "Assessing the value of a government call centre in India: A case study." *IIM Kozhikode Society & Management Review* 8(1): 23–33. DOI: 10.1177/2277975218817403.
- Peixoto, Tiago, and Tom Steinberg. 2019. *Citizen Engagement : Emerging Digital Technologies Create New Risks and Value*. Washington, DC: World Bank. <https://openknowledge.worldbank.org/handle/10986/32495>.
- Peixoto, T., and Micah L. Sifry. (2017). *Civic Tech in the Global South, Assessing technology for the public good*. Washington, DC: The World Bank and Personal Democracy Press.
- Peixoto, T. 2013. "Does transparency lead to trust? Some evidence on the subject." available at <https://democracyspot.net/2013/06/19/does-transparency-lead-to-trust-some-evidence-on-the-subject/>.
- Peixoto, T., and Jonathan Fox, J. 2016. "When Does ICT-Enabled Citizen Voice Lead to Government Responsiveness?" WDR 2016 *Background Paper*. Washington, DC: World Bank. <https://openknowledge.worldbank.org/handle/10986/23650>.
- PeoplePowered. n.d. Guide to Digital Participation Platform. <https://www.peoplepowered.org/digital-guide-home>.
- Pradhan, Sanjay. 2021. "Tackling the crisis of citizen trust in governance: The World Bank Group Imperative." <https://blogs.worldbank.org/governance/tackling-crisis-citizen-trust-governance-world-bank-group-imperative>.
- Poder Judicial. 2014. Manual Judicial de Lenguaje Claro y Accesible a los Ciudadanos available at <https://www.pj.gob.pe/wps/wcm/connect/7b17ec0047a0dbf6ba8abfd87f5ca43e/MANUAL+JUDICIAL+DE+LENGUAJE+CLARO+Y+ACCESIBLE.pdf?MOD=AJPERES>.
- Puerari, E., Jotte I. De Koning, Timo Von Wirth, T., Philip M. Karré, Ingrid Mulder, and Derk A. Loorbach. 2018. "Co-creation dynamics in urban living labs." *Sustainability* 10(6): 1893.
- Rakotomalala, O., Tiago Peixoto, and Saki Kumagai. 2020. "Chatbots for Third-Party Monitoring : CivicTech Pilot in Madagascar. Governance Notes; No. 23." Washington, DC: World Bank. <https://openknowledge.worldbank.org/handle/10986/34076>
- Robinson, P. J., and Peter A. Johnson. 2016. "Civic hackathons: New terrain for local government-citizen interaction?" *Urban Planning* 1(2): 65-74. DOI:10.17645/up.v1i2.627.
- Rumbul, R. 2015. *Novel online approaches to citizen engagement*. London: mySociety Publishing.
- Sifry, M. L. 2014. "Civic tech and engagement: In search of a common language." Retrieved from <http://techpresident.com/news/25261/civic-tech-and-engagement-search-commonlanguage>.
- Spada, P., Jonathan Mellon, Tiago Peixoto, and Fredrik M. Sjoberg. 2015. "Effects of the Internet on Participation: Study of a Public Policy Referendum in Brazil." Policy Research Working Paper No. 7204, World Bank Group. Washington, DC: World Bank. <https://openknowledge.worldbank.org/handle/10986/21643>.
- Stempeck, M. 2016. "Towards a taxonomy of civic technology." Retrieved from <https://blogs.microsoft.com/on-the-issues/2016/04/27/towards-taxonomy-civictchnology/>

- Sun, Y., and Wenjie Yan. 2020. "The Power of Data From the Global South: Environmental Civic Tech and Data Activism in China." *International Journal of Communication* 14(20): 2144–2162.
- Thomas, T. H., Kailey Go, Natalie J. McKinley, Kayla R. Dougherty, Kai-Lin You, and Young Ji Lee. 2022. "Empowerment through technology: A systematic evaluation of the content and quality of mobile applications to empower individuals with cancer." *International Journal of Medical Informatics* 104782. <https://doi.org/10.1016/j.ijmedinf.2022.104782>.
- User Centri Cities. n.d. Murcia Citizen App – "TuMurcia" – Murcia. Retrieved June 10, 2022, from: <https://www.usercentricities.eu/services/murcia-citizen-app-tumurcia>.
- Veeckman, C., and Laura Temmerman. 2021. "Urban living labs and citizen science: from innovation and science towards policy impacts." *Sustainability* 13(2): 526. DOI:10.3390/su13020526.
- Verbeiren, B., Solomon Dagnachew Seyoum, Ihab Lubbad, Tian Xin, Marie-Claire ten Veldhuis et al. 2018. "FloodCitiSense: Early warning service for urban pluvial floods for and by citizens and city authorities." In *International Conference on Urban Drainage Modelling* (pp. 660-664). Cham, Switzerland: Springer International Publishing.
- Verhulst, S. 2015. *Unpacking civic tech – Inside and outside of government*. New York: GovLab Digest.
- Wissenbach, K. R. 2020. "Accounting for power in transnational civic tech activism: A communication-based analytical framework for media practice." *International Communication Gazette* 82(6): 545–563. <https://doi.org/10.1177/1748048519832779>.
- World Bank. 2004. "Social accountability: an Introduction to the Concept and Emerging Practice." available at <https://documents1.worldbank.org/curated/en/327691468779445304/text/310420PAPER0So1ity0SDP0Civic0no1076.txt>.
- _____. 2016. *World Development Report 2016: Digital Dividends*. Washington, DC: World Bank. doi:10.1596/978-1-4648-0671-1.
- _____. 2017. *World Development Report 2017: Governance and the Law*. Washington, DC: World Bank.
- _____. 2019. "Special Theme: Governance and Institutions." Available at: <https://documents1.worldbank.org/curated/en/696731563778743629/pdf/IDA19-Second-Replenishment-Meeting-Special-Theme-Governance-and-Institutions.pdf>.
- _____. 2020. GovTech Dataset. Washington, DC: World Bank. <https://datacatalog.worldbank.org/search/dataset/0037889/GovTech-Dataset>.
- _____. 2020. "GovTech: The New Frontier in Digital Government Transformation." <https://thedocs.worldbank.org/en/doc/805211612215188198-0090022021/original/GovTechGuidanceNote1TheFrontier.pdf>.
- _____. 2021. *World Bank Guidebook for Accessible GovTech*. EFI Insight-Governance. Washington, DC: World Bank. <https://thedocs.worldbank.org/en/doc/3fcff7a44bd530a0413e23245ace2f03-0350012021/related/EFI-Insight-Accessible-GovTech-4-1.pdf>.

_____. 2021. *World Development Report 2021: Data for Better Lives*. Washington, DC: World Bank.

_____. 2022. "Citizen Engagement." Webpage consulted on July 28, 2022; available at: <https://www.worldbank.org/en/topic/citizen-engagement>.

_____. 2022. "Environmental and Social Framework." Webpage consulted on May 2, 2022; available at: <https://www.worldbank.org/en/projects-operations/environmental-and-social-framework>.

_____. 2022. "IDA19 Replenishment." Webpage consulted on May 2, 2022; available at: <https://ida.worldbank.org/en/replenishments/ida19-replenishment>.


_____. 2022. "Nigeria: Participatory Governance to Strengthen the Social Contract in Kaduna State." GovTech Case Studies: Solutions that Work. <https://documents1.worldbank.org/curated/en/099120406302234570/pdf/P1755300cad4a80310a1690f06de6c3f3d4.pdf>.


_____. 2022. "What is GovTech?" Webpage consulted on July 28, 2022; available at: <https://www.worldbank.org/en/programs/govtech/priority-themes>.




>>>

**Annex.
Types and Examples
of CivicTech Solutions**

Type	CivicTech Solution	Examples	Problem to be solved	Link
 <p>Openness and Transparency</p>	Central or local transparency portals	Municipal money website (National gov/ South Africa)	Improve knowledge of municipal funding; Encourage responsible spending and accountability.	https://municipalmoney.gov.za/
		Human Ecosystems Bologna (Local gov/Italy)	Data and visualizations of human collaborations in Bologna better understand how these happen and their impact.	https://www.he-r.it/project/hub-human-ecosystems-bologna-2/
	Government websites	The Official Website of Berlin (Local gov/ Germany)	Provide online city services and information (ranked no. 1 in LOSI 2022).	https://www.berlin.de/
		Comunidad de Madrid (Local gov/Spain)	Provide online services and information (ranked no. 2 in LOSI 2022).	https://www.comunidad.madrid/
	Mobile apps	My Columbus (Local gov/USA)	The app gives access to city services, information (such as bus schedules), healthy living tips, environmental initiatives, and a 311 reporting tool.	https://www.columbus.gov/technology/innovation/Mobile-Application/
	Text messages or USSD menus	Pensa (Civil society/ Mozambique)	A low-tech mobile app that uses USSD menus to provide healthcare information in Mozambique.	https://www.pensa.org.mz/
	Operational systems	Digital city services in Rhonda (Local gov/Spain)	Provide information about city services and progress on requests.	https://ronda.sedelectronica.es/info.0

Type	CivicTech Solution	Examples	Problem to be solved	Link
	Open data platforms	The Gauteng City-Region Observatory (Sub-national gov/South Africa)	Improve knowledge of economic and social conditions in the province.	https://gcro.ac.za/
		Asia Open Data Partnership - Dataportal.asia (Regional gov/11 Asian countries)	To improve cooperation and explore potential opportunities of open data across Asian countries.	https://dataportal.asia/home
	Legislation mandating data sharing	Measures on Open Environmental Information 2008 (National gov/ China)	Ensure that environmental information is made public to improve monitoring and accountability.	https://ijoc.org/index.php/ijoc/article/view/13440
 <p>Participation and Engagement</p>	Citizen feedback and complaint handling mechanisms	New York City 311 system (Local gov/USA)	Centralized call center for city services.	https://portal.311.nyc.gov
	Public consultations and e-participation	CitiFeed public expenditure feedback (Sub-national gov/Nigeria)	Enables citizens to support government in tracking public expenditure by reporting on public infrastructure projects, service availability, and quality.	https://kadunaeyesandears.org/
	Public consultations and e-participation	Democracia en Red (Civil society/ Argentina)	To build practice, technique and poetry to imagine and implement innovations of the political system, to open up decision processes, to redistribute power, and to incorporate	https://democraciaenred.org

Type	CivicTech Solution	Examples	Problem to be solved	Link
			participative processes that have impact in terms of public policies.	
	Mobile apps	Monitorizare Vot (Civil society/ Romania)	A tool for election observers to capture observations at polling stations, in line with accepted standards, and for citizens to report irregularities they observe.	https://medium.com/code-for-all/mobile-app-helps-bring-election-monitoring-into-real-time-fe3e3609d05a
	Participatory Budgeting	National Participatory Budget (National gov/ Portugal)	To improve trust, bring people closer to politics, and promote connection and integration between territories.	https://politicsreinvented.eu/model/portugal-the-worlds-first-national-participatory-budget/
		Porto Alegre Participatory Budget (Local gov/Brazil)	To allow citizens to make proposals, vote in citizen consultations, propose projects, decide on municipal regulations, and open debates.	https://opdigital.prefeitura.poa.br
	E-Petition systems	Scottish Parliament e-Petitions (National gov/ Scotland)	Enables individuals to raise issues with the Scottish Parliament.	https://www.parliament.scot/get-involved/petitions/about-petitions
	Digital voting	Electronic voting (National gov/ Estonia)	To allow votes to be cast via the internet.	https://www.id.ee/en/article/e-voting-and-e-elections/ https://www.valimised.ee/en/internet-voting-estonia

Type	CivicTech Solution	Examples	Problem to be solved	Link
 <p>Collaboration, Co-design, Co-creation, Co-production</p>	User Driven Prototyping	Digicampus TU Delft (Academia/ Netherlands)	To connect the fragmented innovation landscape, so that science, government, market parties, and citizens can jointly shape the public services of the future.	https://www.tudelft.nl/en/2019/tu-delft/digicampus-accelerates-innovation-in-digital-government-services
	Living Labs	Siyakhula Living Lab (Private sector/ South Africa)	To develop and field-test the prototype of a simple, cost-effective and robust e-business/ telecommunication platform, to deploy in marginalized and semi-marginalized communities.	https://siyakhulall.org
	Co-Creation of digital services with older adults	Bremen co-creation (Civil society/ Germany)	To support and collect information and services related to health, social security, and day-to-day activities that interest senior citizens through the “MyOpenBremen” mobile public service.	https://www.mobile-age.eu/project-outcomes/videos-new/bremen/videos-about-co-creation.html
	Civic Hackathons	Code for America (Civil society/ United States) Code for Africa (Non-profit/ African countries)	To bring together a mix of technologists, designers, urban planners, social scientists, NGOs and CSOs, and government to approach and solve social and civic problems using technology, data, and digital tools.	https://codeforamerica.org/ https://medium.com/code-for-africa

Type	CivicTech Solution	Examples	Problem to be solved	Link
	Public Internet of Things	Fasprk by Urbiotica (Private sector/ Barcelona)	To lower the amount of time required to find parking and traffic congestion.	http://urbiotica.com/en/solution/urban-parking-guidance/
	Crowd-sourcing	Tana River Climate Change & Livelihoods Restoration Project by Ushahidi (Non-profit/ Kenya)	To contribute to enabling environmental policy implementation, governance, and environmental management through evidence generation using crowd geotagging.	https://tclirp.ushahidi.io/views/map

Supported by the GovTech Global Partnership - www.worldbank.org/govtech

