International Labour Organization

E-formalization case study

e-Estonia: A digital society for the transition to formality

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Foreword

The ILO Centenary Declaration for the Future of Work recognizes the role of technological innovations that drives the transformative change in the world of work and its human-centred approach promotes harnessing the fullest potential of technological progress and productivity growth to achieve decent work and sustainable development. The Human Development Report 2019 also highlights how e-formalization could open a path to formality in order to raise productivity and enhance equity for achieving the SDGs.

Today, an increasing number of governments are promoting the application of new technologies to simplify and facilitate the transition from the informal to the formal economy. These "e-formalization policies", as in some cases, are related to e-government initiatives. E-formalization and the use of digital technologies will become more relevant and pertinent given the impact of COVID-19 on the informal economy amid lockdown and physical distancing measures.

During the ILO Centenary International Labour Conference in 2019, e-Estonia was presented as one example of good practice for using digital technologies to implement innovative polices that facilitate transition to formality. Furthermore, Estonia applies many digital solutions in response to COVID-19 and demonstrates how e-formalization could help workers and enterprises manage the crisis and be resilient to prevent the informalization of the formal economy. The lessons learnt from the Estonian experience on e-formalization are inspiring for other countries who are searching for innovative solutions to transition to formality.

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1. Introduction

Known as a "technological tiger"[1] and the "world's most digitally advanced society"[2], over the past three decades Estonia has invested heavily to develop its IT infrastructure and support a digital culture among its citizens. Today, approximately 98 per cent of tax declarations are completed online and in a matter of minutes. In addition, 98 per cent of companies are registered online and these businesses can file their annual reports and update their own data through the e-Business Register.[3]

To formalize private person-to-person services, anyone can open an Entrepreneur Account at a bank and automatically have their taxes deducted from payments. Moreover, among its many accolades, Estonia was ranked first in entrepreneurial activity by the World Economic Forum in 2017, first in start-up friendliness by Index Venture in 2018, and first amongst EU countries in the European Commission's 2020 digital economy and society index.[4] With the Covid-19 pandemic, Estonia navigated the shift to teleworking relatively seamlessly because of its already existing IT infrastructure and digital culture.

With such wide-ranging measures and demonstrated success, Estonia is a prime case study to better understand how the usage of technology can play a role – both directly and indirectly – in encouraging the transition of unregistered workers and unregistered economic units to the formal economy. Given that everything in the online world leaves a trace, digital technologies can make interactions between the state, workers and employers more transparent, regulated and straightforward.

Policies of *e-formalization* which use technologies to facilitate the transition to the formal economy can provide various incentives to encourage this formalization of economic activity. By doing so, these policies can contribute to the achievement of decent work and, eventually, productive and full employment.

This ILO case study will first situate the discussion of the link between technology and the formalization of the economy and the relevance of e-formalization policies. It then delves into the Estonian case by first giving a historical background of the country's digitalization process before moving to a full overview of the range of e-formalization measures in place. It concludes with lessons learnt about the conditions for success and replicability. Particularly given the Covid-19 pandemic which saw many countries shift to increased usage of digital technologies, this case study can provide useful insights for countries looking for innovative solutions for the transition to formality whilst also adapting and recovering from the Covid-19 pandemic.

1 Ben Aris, "Technological Tiger," The Guardian, 2004, https://www.theguardian.com/world/2004/apr/22/eu.politics4.
2 Matt Reynolds, "Welcome to E-Estonia, the World's Most Digitally Advanced Society," Wired.co.uk, 2016, https://www.wired.co.uk/article/digital-estonia.
3 Government of Estonia, "E-Estonia: Business and Finance - e-Business Register," e-Estonia, 2020, https://e-estonia.com/solutions/business-and-finance/e-business-register/.
4 Government of Estonia, "E-Estonia Facts," e-Estonia, 2020, https://e-estonia.com/wp-content/uploads/e-estonia-facts-210820.pdf.

2. Technology and e-Formalization

The introduction of new technologies has greatly affected the world of work and will continue to play a key role in the future of work. Technologies alter not just the *what* of the type of work we do, but also the *why* and the *how* of work. In a world with over 2 billion workers in the informal economy, a key question which arises is how to harness these new technologies to promote the formalization of the economy, thus providing workers' access to social protection, decent labour standards and a fair income. The challenge involves the formalization of both economic units as well as employment.[5]

A significant milestone of international commitment for addressing the matter of informality was the 2015 International Labour Conference, where the ILO's tripartite constituents adopted *ILO Recommendation 204 concerning the Transition from the Informal to the Formal Economy*. The *Recommendation* provides guidance on how to facilitate the transition to formality, promote decent jobs in the formal sector, and prevent the informalization of jobs in the formal economy. Means to achieve these objectives include integrated policy frameworks which focus on inclusive growth, social protection, social dialogue, and enterprise development. Elsewhere, the ILO has also outlined four main strategies for encouraging the transition to formality as falling under the areas of productivity, regulations, incentives and enforcement.[6]

Importantly, *Recommendation 204* mentions that formalization can be promoted through increased access to technology.[7] Already, there are positive developments on the usage of technology in the expansion of e-government initiatives. These initiatives use information and communication technologies (ICTs) to improve public service delivery and make it "more effective, accessible and responsive to people's needs… increasing participation in decision making and making public institutions more transparent and accountable".[8] Indeed, those countries with higher e-government scores have lower rates of informality.[9]

Policies which address how public institutions tackle informality and use technology to promote the formalization of the economy are called *e-formalization policies.* Such policies can use technology to directly and indirectly promote formalization to address the multi-faceted challenges of ensuring the registration of both economic units and of employment and the provision of social protection. Moreover, e-formalization policies can also twin together improving registration with increasing productivity[10] whether it be virtual one-stop-shops to register a business, the easy registration of transactions, or the quick sharing of tax information between government institutions, technology can be a useful tool in smoothing the transition to formality.[11] However, such e-formalization endeavours are relatively recent. It is in this sense that the experience of Estonia – the world's most digital society – can provide insights and lessons of good practice.

5 Juan Chacaltana, Vicky Leung, and Miso Lee, "New Technologies and the Transition to Formality: The Trend Towards e–Formality," Employment Working Paper (Geneva, 2018).
6 Chacaltana, Leung, and Lee; Tejeshwi Nath Bhattarai, "Emerging Trends in the Use of Technology as a Driver of the Transition to Formality: Experiences from Asia and the Pacific," ILO Asia-Pacific Working Paper Series, 2018.
7 International Labour Conference, "Recommendation 204 Concerning the Transition from the Informal to the Formal Economy," 2015, para. 24. The exact recommendation reads, "Members should provide incentives for, and promote the advantages of, effective transition to the formal economy, including improved access to business services, finance, infrastructure, markets, technology, education and skills programmes, and property rights."
8 UNDESA, "E -Government Survey 2016: E-Government in Support of Sustainable Development" (New York, 2016).
9 Chacaltana, Leung, and Lee, "New Technologies and the Transition to Formality: The Trend Towards e–Formality," 8.
10 For example, the Tabletas Concanaco project in Mexico provided SMEs with a tablet which helped them electronically record sales, provide electronic billing and accommodate debit and credit cards. For more information, see Chacaltana, Leung and Lee (2018).
11 Juan Chacaltana and Vicky Leung, "Transitioning to the Formal Economy Through Technology: The Trends Towards e-Formality," ILO.org, 2019, https://www.ilo.org/employment/about/news/WCMS_699006/lang--en/index.htm.

3. Looking Back: Estonia's Pathway Towards Digital Governance

As of 2019, Estonia's statistics on digitalization are impressive: 99 per cent of Estonians have an electronic ID card, 99 per cent of state services are online, 47.6 per cent of Estonians voted online, and the country has over 70,000 e-Residents.[12] Today, Estonia's digital infrastructure touches the diverse areas of education, medical services, business, voting and citizenship. But how did Estonia get to this point?

Estonia's digital story begins at the end of communism when the country regained independence in August 1991. A combination of factors – including financial constraints, human resource limitations, positive private-public sector collaboration and good timing – led to the government adopting its early digital strategy and promoting the usage of technology among its people. However, rather than a grand strategy, Estonia's digitalization process is best characterised by "development-driven strategies rather than by strategy-driven development".[13]

In 1991, Estonia faced significant constraints. It did not have natural resources to generate wealth and financial resources. Moreover, it lacked experienced manpower. After the collapse of communism, the Estonian government decided to remove the previous Soviet administrative system and start afresh.[14] Having removed previous Soviet bureaucrats also meant that there were many young university graduates enthusiastic to work for the government. These young recruits were willing to test new ideas and were not restrained by any legacies from the previous institutional and bureaucratic system.[15] Estonia also benefitted from the presence of IT specialists through the Soviet Union's heavy emphasis on cybernetics. The Estonian Academy of Sciences founded its Institute for Cybernetics (IoC) in 1960, based in the Estonian capital of Tallinn. The IoC covered a wide range of fields including artificial intelligence, architectural modelling, programming, and hardware construction.[16] Following Estonia's independence in 1991, this centre for computer science, therefore, was able to contribute experts in computer systems and security, with extensive R&D talent, to help push Estonia's digital transformation forward.[17] Therefore, faced with financial constraints but with IT talent, the country decided to focus on the online economy and technological innovation as the road to development while still reducing government costs and improving the life of its citizens.[18] As Head of the Intelligence Department at the Estonian Tax and Customs Board, Janek Leis, best summarised, "the mindset has always been there: if it can be digitalized then it should be digitalized."[19]

The Estonian government launched its first digital strategy in 1994 entitled *The Estonian Way to the Information Society.* Promoting digitalization and ICTs was implemented in the middle and late

12 Government of Estonia, "E-Estonia," accessed November 2, 2020, https://e-estonia.com/.
13 Tarmo Kalvet, "The Estonian Information Society Developments Since the 1990s," PRAXIS Working Paper (Tallinn, 2007), 11.
14 Florian Marcus, "Interview with Susan Divald," 2020; Marc Ernsdorff and Adriana Berbec, "Estonia: The Short Road to e-Government and e-Democracy," in *E-Government in Europe: Re-Booting the State*, ed. Paul G Nixon and Vassiliki N. Koutrakou (London: Routledge, 2006), 172.
15 Dmitri Jegorov, "Interview with Susan Divald," 2020.
16 Aro Velmet, "The Blank Slate E-State: Estonian Information Society and the Politics of Novelty in the 1990s," *Engaging Science, Technology, and Society* 6 (2020): 166–67, https://doi.org/10.17351/ests2020.284.
17 Rainer Kattel and Ines Mergel, "Estonia's Digital Transformation: Mission Mystique and the Hiding Hand," 2018, 12; Matthew Sorell, "What Australia Can Learn About E-Government from Estonia," The Conversation, 2015, https://theconversation.com/what-australia-can-learn-about-e-government-from-estonia-35091.
18 Virginia Castaños, "Case Study Report: E-Estonia" (Brussels, 2018), 5; Mari Roonemaa, "Global Lessons from Estonia's Tech-Savvy Government," UNESCO Courier, 2017, https://en.unesco.org/courier/2017-april-june/global-lessons-estonia-s-tech-savvy-government.
19 Janek Leis, "Interview with Susan Divald," 2020.

© e-Residency

1990s and was seen as a way to foster Estonian competitiveness, reduce social inequality and promote positive state-citizen relationships.[20] Estonia's digitalization policies had support not just from the government, but from the banking sector, private companies and academics. Moreover, these companies were mainly home-grown. Given the high price of using big name companies such as IBM and Microsoft, the Estonian government decided to work with Estonian-based companies, thus beginning the strong collaborative spirit between the private and public sectors in Estonia in IT.[21] Local home-grown companies included Microlink – the biggest Baltic IT company – and Estonian Mobile Telephone.[22] Over the course of 1996-2003, the Estonian government aided the development of the country's IT infrastructure by allocating 1 per cent of its budget to the IT sector.[23]

The importance of the interaction between the public sector, IT sector and private banks cannot be underscored enough. Government saw IT as a means of establishing efficient government while from the IT perspective, the internet was evolving at the right pace for IT companies to be able to contribute.[24] An important third partner was the banking industry which, through its introduction of internet banking, attracted internet users and highlighted the relevance of online services. It was in the bank's own interests to have service users access online banking rather than staff its physical offices. Consequently, the banking sector was keen to support IT education and have Estonian citizens use their online services as quickly as possible.[25] In addition, there was – and still remains – significant rotation of employees between the public and private sector and innovation is supported throughout government.[26] These mutually supportive relationships made the promotion of digitalized government services affordable and achievable.

20 Pille Runnel, Pille Pruulmann-Vengerfeldt, and Kristina Reinsalu, "The Estonian Tiger Leap from Post-Communism to the Information Society: From Policy to Practice," *Journal of Baltic Studies* 40, no. 1 (2009): 33, https://doi.org/10.1080/01629770902722245.

21 Marcus, "Interview with Susan Divald"; Kattel and Mergel, "Estonia's Digital Transformation: Mission Mystique and the Hiding Hand," 6.

22 Ernsdorff and Berbec, "Estonia: The Short Road to e-Government and e-Democracy," 172.

23 Andre Krull, "ICT Infrastructure and E-Readiness Assessment Report: Estonia" (Tallinn, 2003), 6.

24 Meelis Kitsing, "Explaining the E-Government Success in Estonia," *Policy & Internet* 3, no. 1 (2011): 9, https://doi.org/10.2202/1944-2866.1095; Leis, "Interview with Susan Divald"; Indrek Õnnik, "Interview with Susan Divald," 2020.

25 Kitsing, "Explaining the E-Government Success in Estonia," 9; Kattel and Mergel, "Estonia's Digital Transformation: Mission Mystique and the Hiding Hand," 8.

26 Kattel and Mergel, "Estonia's Digital Transformation: Mission Mystique and the Hiding Hand," 7–9; Jegorov, "Interview with Susan Divald."

Two major initiatives which set the stage for Estonia's digital society were the 1997-2000 Tiger Leap Programme and the Look@World initiative from 2002-2004. Moreover, they demonstrate the importance of financing from the banking sector as well as from the government. The Tiger Leap Programme aimed to equip all Estonian schools with computers and internet connections and was funded by private and public sector organizations. It achieved stunning results. By 2004, 73 per cent of students had used computers in the classroom compared to just eight per cent in 2000.[27] Look@World was a public-private partnership funded by banks and telecom aimed at popularizing the internet and bridging the 'digital divide' between citizens. By travelling around Estonia in makeshift tents, citizens could come and learn the basics about computers and the internet, such as writing an email. This free computer training was provided to approximately 103,000 participants, or about 10 per cent of Estonia's adult population.[28] The importance of digital skills and computer-related education is best summed up by Estonian Global Affairs Director Indrek Õnnik:

> There's no point in building digital services for individuals if they don't have the knowledge for how to access the tools.[29]

The success of both programmes also illustrate the cultural support for the digitalization process and the openness and willingness to take part. It was seen as Estonia's competitive edge and a source of national pride.[30]

In this period, the promotion of formality was not a chief concern nor the primary driver of the digitalization process. At the same time, the digitalization process addressed issues of corruption and informality.[31] By increasing the number of government services online, Estonia's e-government policy removed the 'middle man' from citizen-state interactions. By providing equal access to information for all its citizens, the government could promote formalization. Whether registering a company online, submitting company annual reports, or publishing public procurements online, these digital interactions meant the elimination of the middle man. As previous Estonian President Toomas Hendrik Ilves once said,

> you can't bribe a computer.[32]

By the late 1990 and early 2000s, policies and legislation were being put in place which would greatly impact the digital infrastructure – and thus indirectly promote formality - for decades to come. This includes e-tax in 1999 allowing the completion of one's tax declaration online, e-identity in 2000 which made having a digital identity compulsory, and the introduction of the digital infrastructure of X-Road in 2001.[33] From the perspective of workers, moreover, the 2000 *Social Tax Act* tied provision of these social protection schemes to the condition of official employment.[34] This thus created incentives for workers to be registered to access these benefits. Since these initial measures, the portfolio of digital services has grown substantially. All of these foundational policy frameworks and additional interventions will be unpacked in the next section.

27 Velmet, "The Blank Slate E-State: Estonian Information Society and the Politics of Novelty in the 1990s," 176.
28 Roonemaa, "Global Lessons from Estonia's Tech-Savvy Government."
29 Õnnik, "Interview with Susan Divald."
30 Runnel, Pruulmann-Vengerfeldt, and Reinsalu, "The Estonian Tiger Leap from Post-Communism to the Information Society: From Policy to Practice," 34.
31 Marcus, "Interview with Susan Divald"; Velmet, "The Blank Slate E-State: Estonian Information Society and the Politics of Novelty in the 1990s," 172.
32 Eugenui, "E-Governments vs. Corruption: The Case of Estonia," Digital Initiative: Harvard Business Review, 2016, https://digital.hbs.edu/platform-rctom/submission/e-governments-vs-corruption-the-case-of-estonia/.
33 Kattel and Mergel, "Estonia's Digital Transformation: Mission Mystique and the Hiding Hand," 1.
34 Government of Estonia, "Social Tax Act" (2000), https://www.riigiteataja.ee/en/eli/ee/514112013022/consolide/current.

4. e-Estonia's Structure, Policies and Results

4.1 Four Guiding Principles to Implement a Digital Infrastructure

Estonia's digitalization approach needed two foundational components – digital identification as well as a data exchange layer – to enable e-formalization policies to take off. These two components, however, are complemented by four guiding principles of digital governance which have significantly contributed to e-Estonia's success. These four guiding principles are:

- **Privacy and data protection**: Through the 1996 *Personal Data Protection Act* and 2000 *Public Information Act,* Estonians have the right to the inviolability of private life. Moreover, the owner of data is the person. Consequently, every person has access to which government authority looked at their data through the eesti.ee portal. If the person has concerns about why an institution looked at their data, they can bring this to the Data Protection Inspectorate.[35]

- **Once only principle**: Enshrined in Estonia's 2000 *Public Information Act*, this principle means that a person only needs to give their data to a state institution once. If any other institution of the state needs that data, it cannot ask the person again. The collection of duplicated personal data is prohibited. This encourages state institutions to create roads of communication with each other.

- **Responsibility of data security is on the institution that collected it**: Also set out in the *2000 Public Information Act,* the institution which collected data on an individual is responsible for keeping it secure. The knock-on effect is that this incentivizes institutions to collect the minimum amount of data necessary.

- **Decentralization of data exchange**: Data exchange is intentionally decentralized, without a meta-database collecting everyone's data. This reduces security risks. If one database is hacked into, the hacker will not be able to access all the available data on a user. For this reason, established in 2001, the official and legal data exchange layer is called X-Road.

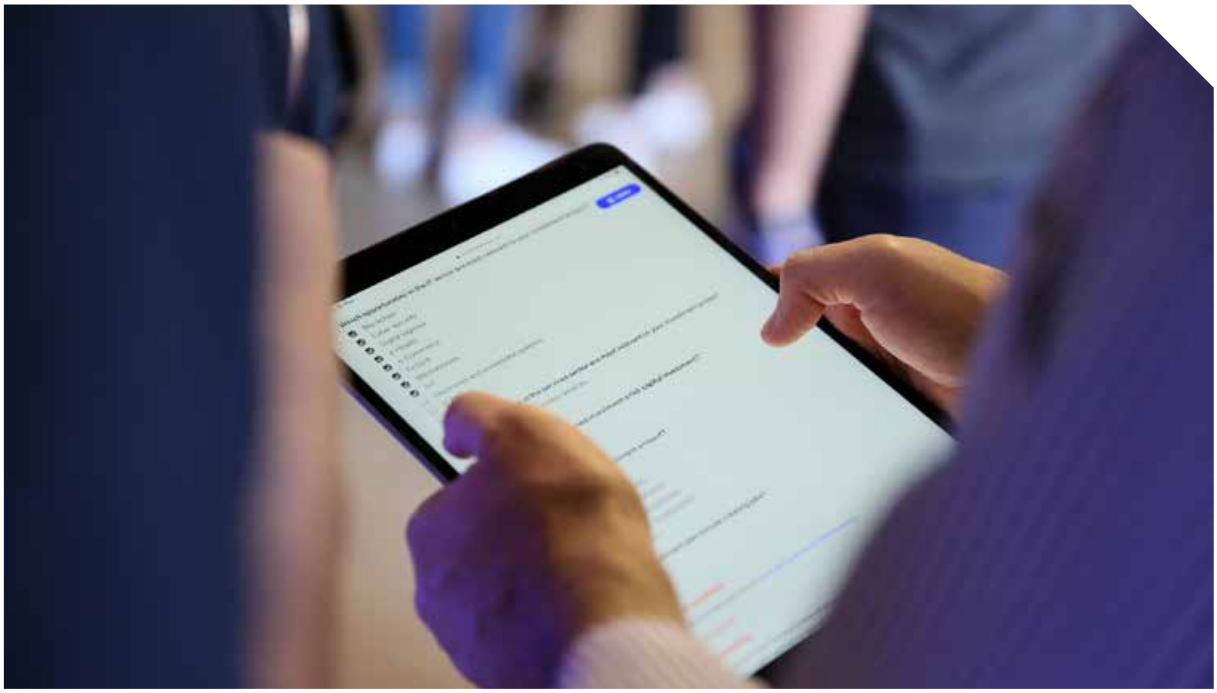
With the success of Tiger Leap and Look@World programmes where Estonians were educated in basic usages of computers and the internet, the government further added measures for the usage of digital technologies. The first fundamental step was the legal requirement for Estonian citizens and residing foreigners above the age of 15 to have a digital identity set out in the 2000 *Identity Documents Act.* This piece of identification also serves as physical identification and can be used for travel between most European countries as well. The electronic ID-card has two pin codes. The first code serves for identity authentication. For example, for a user to access their online tax declaration they would first have to input their authentication pin code. The second pin code is to validate any transaction, whether it be banking transactions, online voting, submitting a tax declaration, etc.[36] To further increase the relevance of digital identity, the 2000 *Digital Signatures Act* regulated the usage of digital signatures. Digital signatures are given equal weight to handwritten signatures. The usage of this e-ID and digital signature applies to both public and private services.[37]

The first digital identity cards were issued in January 2002. The take up of the usage of e-ID cards was slow at first. It took off after 2007 with the involvement of private banks who created additional incentives by preferring digital identification for access to online banking services. As more services became available online – such as tax declarations and refunds – the usage of digital identification and

35 Government of Estonia, "Personal Data Protection Act" (1996); Government of Estonia, "Public Information Act" (2000), https://www.riigiteataja.ee/en/eli/514112013001/consolide; Kristjan Vassil, "Estonian E-Government Ecosystem: Foundation, Applications, Outcomes," 2015.

36 Vassil, "Estonian E-Government Ecosystem: Foundation, Applications, Outcomes," 2–5.

37 Government of Estonia, "Identity Documents Act" (2000), https://www.riigiteataja.ee/en/eli/504112013003/consolide; Government of Estonia, "Digital Signatures Act" (2000), https://www.riigiteataja.ee/en/eli/530102013080/consolide.



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digital signatures also grew and became more commonplace.[38] Moreover, the government introduced two other forms of digital identification – Smart ID and Mobile ID. The latter was launched in 2007 and is a digital identification tied to one's mobile phone. The former is provided by the private sector and can also be used for online banking as well as digital signatures.[39] As of 2019, 67 per cent of Estonians use their e-ID card regularly. Since the introduction of digital signatures, more than 900,000 digital signatures have been made and it is estimated to save up to 5 working days per year.[40]

The second necessary component to digitalization was having the necessary digital infrastructure in place. Estonia decided to implement its digital infrastructure through X-Road. X-Road provides the exchange layer through which different government institutions can share data with each other, thus remaining in accordance with the *once only principle*. X-Road is decentralized and requires every institution to be able to share data with others, accompanied by stringent security measures. Moreover, X-Road is also used as the means by which the private and public sector can link up and safely share data.[41] It has made complex queries much more efficient to run, saving time and financial resources. For example, a government service which requires access to different data repositories can be done much quicker with X-Road than if relevant staff were to conduct the query themselves. The increased efficiency of X-Road was contingent on a threshold level of databases (estimated at 50) which made the time and money saved readily apparent.[42] It has also been extended as a means of data exchange between Estonia and Finland.[43]

With these two fundamental elements in place, coupled with the four guiding principles of digitalization, digital services continued to expand in Estonia. For example, digital services expanded to include e-tax (2000), e-banking (2000), e-school (2003), e-Voting (2005), e-Notary

38 Vassil, "Estonian E-Government Ecosystem: Foundation, Applications, Outcomes," 7–9.
39 European Commission, "Digital Government Factsheet: Estonia" (Brussels, 2019), 28.
40 Government of Estonia, "E-Identity," 2020, https://e-estonia.com/solutions/e-identity/id-card/.
41 Castaños, "Case Study Report: E-Estonia," 5.
42 Vassil, "Estonian E-Government Ecosystem: Foundation, Applications, Outcomes," 11–19.
43 Information System Authority, "Finland's and Estonia's Data Exchange Layers Connected to One Another on 7 February - The Rapid Exchange of Information Between the Countries Is Now Possible," 2018, https://www.ria.ee/en/news/prc-finlands-and-estonias-data-exchange-layers-connected.html.

(2006), e-police (2007), e-Business (2007), e-Health (2008) and e-Residence (2014).[44] Digital identification has become a gateway for both public and private services, making life more easy and efficient, with regulations in place to make digital governance as safe and secure as possible.

Importantly, throughout these reforms, Estonia's approach to informality was one that desired to create the legal and policy frameworks to facilitate legal and formal economic behaviour. The government's assumption was *not* that enterprises and workers want to be informal but rather that if they were, it was because the system was too complicated. Indeed, in the Estonian context, the main battle linked to informality is against undeclared work – defined as a lawful paid activity that is not declared to public authorities.[45] In 2013, undeclared work in the private sector stood at 14.8 per cent of total labour input, the seventh highest in the EU.[46] To that effect, creating simple and easy-to-follow solutions to declaring work has been the priority of the government.[47] To this end, many programmes and incentives have been put in place and are outlined below.

4.2 Supporting Formalization through Direct and Indirect Measures

There is an extensive network of measures in place which tie directly and indirectly to supporting formalization of both economic units and workers. The mixed bag of measures include those which provide incentives for formality and improve the enforcement of formality. Taken together, the use of digital technology in these measures has enabled the Estonian government to address issues linked to undeclared work. Moreover, the different regulations in place as discussed above in Section 4.1 ensure that data is as secure and safe as possible for the user.

The first important element was the introduction of e-Tax. First introduced in 2000, e-Tax facilitates the online declaration of tax. Run by the Estonian Tax and Customs Board (ETCB), any taxpayer can file their tax return online. In addition, in 2003, the tax return became pre-filled based on data that had been collected. Therefore, and unsurprisingly, it takes an average of three minutes to complete one's tax declaration online. Not only used for individual income tax claims, companies themselves can also declare income tax, social tax, unemployment insurance and pension fund contributions through e-Tax.[48] A significant incentive to convince taxpayers to file their taxes online was linked to the quick refund of money if one had overpaid. Rather than filing a paper application which could take weeks to process and distribute a refund, the electronic filing of one's tax declarations meant a refund waiting period of five days. The users of e-Tax increased consistently from 59 per cent in 2004, to 92.4 per cent in 2010, to 95 per cent in 2015.[49] By 2019, approximately 98 per cent of tax declarations are completed online and use the digital identification method as elaborated above in Section 4.1.

Regarding the formalization of workers, access to medical insurance and pension are dependent on the formal registration of employment. This provides a significant incentive for workers to have formalized employment rather than work informally. This link between formal registration and insurance was laid out initially in the 2000 *Social Tax Act*. Whether working in a company or as self-employed (covered later below), access to social protection is contingent on registration.

To further support the registration of employees, amendments in 2014 to the *Estonian Taxation Act* made it mandatory of employers to register their workers on an employer's register. The Estonian Tax and Customs Board (ETCB) established this as an electronic register. It meant that employers could register their new employees online in a 'one-stop shop'which also inputted the information to the Estonian Health Insurance Fund and the Unemployment Insurance Fund, thereby automatically enrolling the worker in social protection. Through the register, those working in the ETCB have better monitoring mechanisms to make sure that employees are registered and taxes are paid. Moreover, employees can also check whether their employment is registered with the tax authority

44 Government of Estonia, "E-Estonia."
45 European Commission, "Undeclared Work," 2021, https://ec.europa.eu/social/main.jsp?catId=1298&langId=en.
46 Colin C. Williams et al., "An Evaluation of the Scale of Undeclared Work in the European Union and Its Structural Determinants: Estimates Using the Labour Input Method" (Brussels, 2017).
47 Marcus, "Interview with Susan Divald"; Õnnik, "Interview with Susan Divald."
48 Government of Estonia, "E-Estonia: Business and Finance - e-Tax," e-Estonia, 2020, https://e-estonia.com/solutions/business-and-finance/e-tax.
49 Maarit Ströbele, Nele Leosk, and Alexander H Trechsel, "Two Countries/Two Decades/Two Outcomes: A Brief Comparison of e-Government Solutions in Estonia and Switzerland" (Zurich, 2017), 13–14.

and verify whether their employer is claiming their work as legally required to. The sectors most affected by informal work arrangements are construction, manufacturing and small-scale services like hairdressers. It is here that the employers registry proves its use as it makes registration easier.[50] Results were positive: in the first year over 21,000 workers were formalized and had an estimated monetary impact of 11.8 million euros in tax revenue.[51]

For those workers who are unemployed, formal registration as unemployed means access to the Unemployment Insurance Fund. In July 2019, the Estonian government introduced the usage of AI (artificial intelligence) through its "Kratt" strategy to match unemployed workers to jobs. It is further developing the algorithm for job seeker profiling. Such measures help unemployed workers return to the formal labour market quickly.[52] The use of artificial intelligence has been more effective in matching unemployed workers to jobs than employed staff.[53]

Moving to promoting the formalization of economic units, Estonia's digital culture has made it easy to register one's business. The establishment in 2007 of the e-Business Register makes registering a business online a simple and efficient process, and can be done without the usage of a notary. For the legal framework of the business, once logged into the portal, a business owner can access different legal templates with articles of association which the business owner can use and assemble as is best fit to his/her needs. Again, because these are legally coherent and relevant, there is no need for a notary nor lawyer to help set up the business.[54] The e-Business Register also allows the company to update its own data, file annual reports, and make queries about other companies. As of 2019, 98 per cent of companies were established online.[55]

Another important development was in 2014 with the distribution of the first e-Residency card. The concept of e-Residency began in 2008 when Estonia opened up its e-services to non-Estonian citizens. The system was formalized in 2014 where anyone in the world could apply. Upon successful application, the e-Resident was given an Estonian e-ID and access to Estonia's digital business environment. The e-Resident could perform the following online: digitally sign documents; register a company; open and access a bank account; and declare taxes. The policy was aimed at promoting Estonia's image as a leading provider in online services and to advance its economy.[56] As of 2020, there were more than 70,000 Estonian e-Residents, establishing over 13,000 companies and from over 160 countries. A system which facilitates the quick and easy opening of businesses by non-residents makes it easy to formalize activity whilst also paying taxes to the Estonian government.[57]

Importantly, further measures were put in place to increase reporting of VAT transactions and decrease VAT fraud. At the end of 2014, companies were legally required to report 1,000 euro transactions which also decreased the incidence of fictitious bills. Results were quick to see. Within the first half of 2015, the ETCB received 95 million euros more than it did than in the whole 2014 year.[58]

A recent innovation which arose in January 2019 was the creation of an entrepreneurial account, or business account, in collaboration with an Estonian bank, LHV.[59] While LHV is the bank that offers the service, it is open to other banks as well. The entrepreneurial account is an ideal system for private person-to-person services such as personal cleaners, lawn mowers, nannies, etc. and a simple solution to decrease the informal economy. When the entrepreneur becomes a business account owner, the bank automatically transfers his/her information to the tax authorities and calculates the amount

50 Leis, "Interview with Susan Divald."
51 Leis.
52 Amanda Haynes, "New E-Estonia Factsheet: National AI 'Kratt' Strategy," e-Estonia, 2020, https://e-estonia.com/new-e-estonia-factsheet-national-ai-kratt-strategy/.
53 Marcus, "Interview with Susan Divald."
54 Marcus.
55 Government of Estonia, "E-Estonia: Business and Finance - e-Business Register."
56 Ströbele, Leosk, and Trechsel, "Two Countries/Two Decades/Two Outcomes: A Brief Comparison of e-Government Solutions in Estonia and Switzerland," 16–18; Government of Estonia, "E-Residency," 2020, https://e-resident.gov.ee/.
57 Government of Estonia, "Factsheet: E-Residency," 2020, https://e-estonia.com/wp-content/uploads/e-residency-factsheet-aug2020.pdf.
58 BC, "Obligation to Report 1,000 Euro Transactions Boosted VAT Revenue in Estonia in H1," The Baltic Course, 2015, http://www.baltic-course.com/eng/analytics/?doc=108771.
59 LHV Bank, "Entrepreneur Account," 2020, https://www.lhv.ee/en/entrepreneur-account#what-is-it.

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of tax to be paid. All this is done free of charge. The income that is transferred to the account automatically deducts the 20 per cent tax rate (or 40 per cent if over 25,000 euros; the maximum amount of income on this account is 40,000 euros). The business account owner can also receive health insurance as long as the user contributes the minimum amount of social tax (as of early 2021, the minimum social tax obligation was 192.72 euros).[60] As of October 2020, over 3,000 new entrepreneurial accounts have been created with more than 1 million euros of payments to the accounts.[61] Such measures make it easy to comply with tax rules and thereby also reduces the informal economy.[62] If the business account owner earns above 40,000, they must either register as a sole proprietor (paying social tax and therefore being covered by social protection) or as a business as legal person.[63]

Finally, in June 2020, the ETCB launched a new e-service which allows businesses to see their tax behaviour rating online. The legal representative of the company can view the rating which is based on a traffic-light system. Green represents "everything is okay", yellow indicates "some deficiencies" and red means "serious deficiencies", with guidance provided on how to rectify the rating. Issues are often about incomplete data, but the largest amount of cases are linked to "envelope wages" – i.e. declared wages of a company which are much lower than the average wages for similar positions.[64] Seeing the company rating in advance allows the company to address the issue before they are further notified by the ETCB.[65] As such, this measure provides the incentives for companies to address their ratings before they are notified. As audits are expensive and time-consuming

60 Republic of Estonia Tax and Customs Board, "Entrepreneur Account for Natural Person," emta.ee, 2021, https://www.emta.ee/eng/private-client/declaration-income/entrepreneur-account-natural-person. The social tax obligation covers pension rights and health insurance.

61 Kairit Veerberk, "Estonian Tax and Customs Board Launched an Entrepreneur Account for Natural Person," Intra-European Organisation of Tax Administrations, 2019, https://www.iota-tax.org/news/estonian-tax-and-customs-board-launched-entrepreneur-account-natural-person; Liiva Siiri, "Ettevõtluskontodega on Kogutud Üle Miljoni Euro Makse," arileht.ee, 2020, https://arileht.delfi.ee/news/uudised/ettevotluskontodega-on-kogutud-ule-miljoni-euro-makse?id=91436512.

62 Leis, "Interview with Susan Divald."

63 Many thanks to Dmitri Jegorov for explaining this.

64 Envelope wages also tie into the European Union's concern over undeclared work. According to a 2017 poll in Estonia, small companies with up to 19 employees are more likely to give envelope wages. Moreover, envelope wages are more frequent in the transport, construction and retail industries (see European Commission (2017)).

65 Estonia Tax and Customs Board, "As of Today, Business Operators Can See What They Look Like to the Tax Administration," 2020, https://www.emta.ee/eng/today-business-operators-can-see-what-they-look-tax-administration.

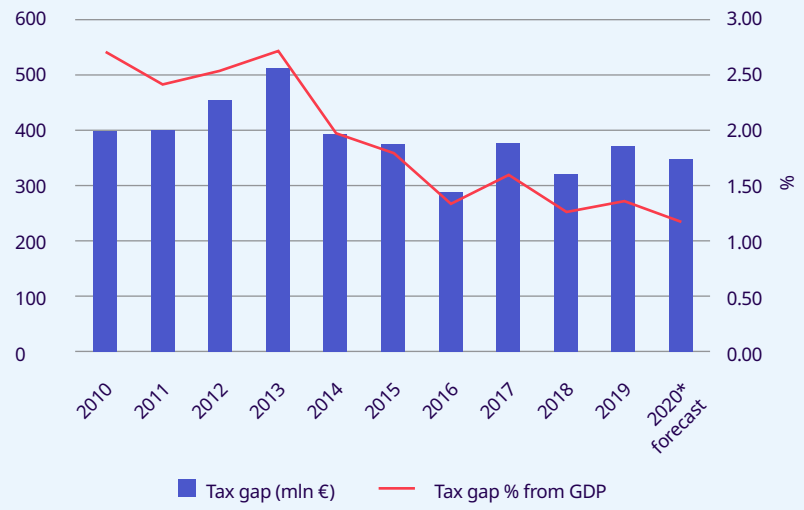
processes, it is in the interest of the businesses as well as the government for companies to quickly address their tax issues if they are making simple and honest mistakes.[66]

4.3 The Results of e-Estonia

The results of the digitalization of public services in Estonia have been far-reaching. In terms of savings in GDP, it is estimated that at least two per cent of GDP is saved through digital signatures. In addition, using the data exchange system of X-Road saves 844 years of working time per year.[67] Making services more efficient benefits the government in terms of cost but also the user in terms of time spent and their own costs. Business registration is estimated to be 14 times quicker digitally and digital signatures save five days a year.[68] With many aspects of paperwork and filing made convenient and transparent, barriers to formality are reduced. As mentioned, it is easier to fill out tax returns, register a business and open a bank account. Making systems easy to follow and to complete renders the formal economy easier to grasp.

The range of measures implemented over the past ten years such as the 2014 Employment Register and stricter VAT regulations, the Estonian government has also been addressing the tax gap. The graph below highlights the positive trends of addressing this tax gap in the Estonian economy over the past ten years. The tax gap decreased from 2.71 per cent of GDP in 2010 to 1.18 per cent GDP in 2020. As Janek Leis, the Head of Intelligence at ETCB affirms, the positive developments in addressing the informal economy "have been mainly because of the digitalization that we have in Estonia".

Tax gap in 10 years with % from GDP



From 2014 changes in legislation:
- started collecting information about invoices
- employment register was launched

From January 2018:
- Vat registration threshold was increased from 16 000€ to 40 000€

From 2019:
- fuel handling system

Source: Estonia Tax and Customs Board 2020.

66 Leis, "Interview with Susan Divald."
67 Government of Estonia, "E-Estonia: Interoperability Services," 2020, https://e-estonia.com/solutions/interoperability-services/x-road/.
68 Enterprise Estonia, "E-Estonia Guide," 2020; Peeter Vihma, "E-Governance Saves Money and Working Hours," e-Estonia, 2020, https://e-estonia.com/e-governance-saves-money-and-working-hours/.

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Thus, e-formalization measures have addressed the tax gap in Estonia and encouraged formalization of economic units and workers. There has been an impressive uptake of digital services – as mentioned, for example, 99 per cent of tax returns are done online, 98 per cent of businesses register online. In addition to these positive trends, among entrepreneurs, 85.3 per cent are satisfied with the quality of e-services, up from 76 per cent in 2012.[69] Interestingly, among the government institutions are seen as trustworthy, a 2019 survey found that 91 per cent of Estonians either 'completely trusted' or 'rather trusted' the police and border guards compared to 60 per cent for the Parliament.[70] Moreover, governments see the successful provision of such services as an integral part of their everyday operations and of improving government to citizen interactions.[71]

Moreover, as mentioned in the Introduction, Estonia has been recognized through high scores on different international rankings. Estonia was ranked first by the World Economic Forum in 2017 for entrepreneurial activity and first in start-up friendliness in 2018 by Index Venture. The next year, in 2019, Estonia was ranked second by Freedom House for internet freedom, and first on the Digital Health Index of the Bertelsmann Foundation. Finally, in 2020, Estonia ranked first in the European Commission's digital economy and society index.[72] Such success is arguably not surprising given the emphasis the Estonian government as placed on a digital culture in the economic sphere.

4.4 Response to Covid-19

When asked about effect of Covid-19 on informality, Estonian government officials unanimously agreed that there was not much of an effect, "we were one of the countries that saw the least amount of changes."[73] There were a few glitches as everything switched to online, but the fact that so much digital infrastructure was already in place across the areas of schooling, health, and employment, made the transition relatively easy. The fact that Estonia's digital infrastructure has helped the country weather the pandemic also points to how digitalization

69 Government of Estonia, "Digital Agenda 2020 for Estonia," 2018.
70 Stanislav Budnitsky, "National Belonging and Exclusion in Estonia's Networked Sovereignty," Global Medias & Technologies Lab, 2020, https://globalmedia.mit.edu/2020/06/23/national-belonging-and-exclusion-in-estonias-networked-sovereignty/.
71 Vassil, "Estonian E-Government Ecosystem: Foundation, Applications, Outcomes," 2.
72 Government of Estonia, "E-Estonia Facts."
73 Jegorov, "Interview with Susan Divald."

can play a role in preventing the informalization of jobs in the formal economy (as per ILO Recommendation 2014).

The changes linked to public e-services for employment – which indirectly links to formalization – are in job matching and the creation of a platform for sharing of the workforce. Regarding job matching, the Estonian Unemployment Insurance Fund provides job matching for temporary jobs. This helps offset the needs of employers in the Covid-19 economy and also gives those who are unemployed temporary work. The format is an online trade fair where both employers and jobseekers can communicate directly with each other. A similar effort is put in place by Share Force One which has a platform to share the workforce. Companies which cannot keep their employees can communicate with companies which temporarily need more workers.[74]

Importantly, the pandemic highlighted the positive relationship and collaboration between different stakeholders. Estonia's IT sector quickly reacted to the need for a coronavirus contact-tracing app, HOIA. The app uses Bluetooth technology to pick up other Bluetooth signals from nearby phones, exchanged anonymous codes for those individuals with whom the user was in close contact. If a person tests positive, they can notify the app, which consequently notifies close contacts. This app was designed through a public-private partnership with a dozen Estonian IT companies involved. Importantly, it was designed *for free*.[75]

The long-term impact on companies of the Covid-19 pandemic is still too early to predict, but it has reinforced the notion and support for creating one's company online.[76] However, what is certain is that the pandemic has incentivized honest reporting in order to receive support from the government. As ETCB Head of Intelligence, Janek Leis, best sums up,

> they (companies) understand that if I declare correctly and pay tax correctly then the government will help us also… they clearly feel the benefit.[77]

Moreover, the Covid-19 crisis also brought to light a different question than is usually considered. There is usually concern over how to plan when digital services fail; however, what had not yet been considered is how to plan for the failure of physical services. The Covid-19 crisis has demonstrated that digital government services do have their role in future planning and service delivery.[78]

74 Government of Estonia, "Digital Solutions from E-Estonia to Combat COVID-19 Crisis," 2020, https://e-estonia.com/wp-content/uploads/factsheet-covid19-solutions-200402-1.pdf.
75 Justin Petrone, "Estonia's Coronavirus App HOIA – the Product of a Unique, Private-Public Partnership," e-Estonia, 2020, https://e-estonia.com/estonias-coronavirus-app-hoia-the-product-of-a-unique-private-public-partnership/.
76 Marcus, "Interview with Susan Divald."
77 Janek, "Interview with Susan Divald."
78 Marcus, "Interview with Susan Divald."

5. Recommendations and Replicability

There are several insights to be gained from Estonia's two decades of experience as a functioning digital society to promote policies of e-formalization. These lessons learnt are extendable to other countries which wish to put in place policies which can directly or indirectly promote the formalization of the economy. The ingredients for success fall roughly into five categories: (1) political will and public-private collaboration, (2) a digital spirit, (3) digital foundations, (4) reducing the impact of legacy systems, and (5) moderate financing.

1. **Political will and successful public-private sector collaboration:** What is consistently found throughout Estonia's experience is the political will across political parties to promote Estonia's digital development.[79] Digitalization and e-government were seen as ways for Estonia's government to be closer to its people. Moreover, additional incentives such as cost-savings – as demonstrated in Section 4.2 above – showed that e-government can indeed save time and money for the government as well as for its citizens. Such political will is also tied to the broader commitment to good governance and sound public policies, without which the effort to address informality would be significantly hampered.

   Another significant element is strong public-private sector collaboration. From the beginning of Estonia's digital transformation in the 1990s, the private sector – such as banks and IT companies – collaborated with the public sector in implementing policies of e-government. Tiger Leap and Look@World relied on public-private collaboration to implement the digital education of Estonia's citizens. Moreover, the incentives put forward by the banking industry to use online banking in the early-mid 2000s reinforced the usage of a digital identity card. Fast-forwarding to today, Estonia's *Digital Agenda 2020 For Estonia* the collaboration continues. Innovation in e-governance is targeted and includes the role of private companies in product development.[80] Therefore, having the support and buy-in across political parties and across the relevant sectors is conducive to the implementation of e-formalization policies.

2. **A societal digital spirit supported by data protection and user-friendly services:** Estonian society has been supportive of digitalization and the shift to e-services. This mindset and openness to the usage of online services is a necessary part to the implementation of e-formalization policies. Admittedly, some countries may struggle with citizen reluctance to have a digital identity card given certain historical legacies or general cultural reluctance. One way to address this is to implement strong data protection legislation. Estonia's guiding principles (as elaborated in Section 4.1) rest on the foundation that the owner of the data is the person and incentives are put in place to collect the minimum amount of data as possible. Moreover, the government has been transparent and open about data breaches – such as the cyber attach in 2007.[81] Such transparency increases trust in the government and the overall trend of usage of digital services has continued to grow.

   Further to this is the government's benevolent view of its citizens and desire to create user-friendly services. Its view is that informality – for the most part – does not happen intentionally. Rather, if informality is present it is because the legal structure and incentives in place are not conducive to formalization. To this end, implementing user-friendly services is a key priority. Common services like tax declarations, registering a business or opening an entrepreneur account are to be as simple as possible. Governments, therefore, who intend to implement e-services should keep in mind transparency, data protection, and user-friendly interfaces.

79 Marcus; Jegorov, "Interview with Susan Divald"; Õnnik, "Interview with Susan Divald"; Ströbele, Leosk, and Trechsel, "Two Countries/Two Decades/Two Outcomes: A Brief Comparison of e-Government Solutions in Estonia and Switzerland."

80 Government of Estonia, "Digital Agenda 2020 for Estonia," 1.

81 Jaan Priisalu and Rain Ottis, "Personal Control of Privacy and Data: Estonian Experience," *Health and Technology* 7 (2017): 441–51.

3. **A digital infrastructure undergirded by digital identity:** Practically speaking, implementing e-formalization policies requires certain fundamental pieces in place, namely digital identification and a digital platform for exchanging data. Estonia's e-ID became a legal requirement of all Estonian and residents in 2000. Usage of digital identification became possible through the X-Road infrastructure which allowed different institutions to exchange and share data. Moreover, the usage of X-Road demonstrated a critical threshold of 50 for the number of databases linked to the system for it to become financially beneficial.[82] The more e-services become linked to each other – such as the registration of tax, access to health insurance, and e-banking, for example – the more using the digital platforms becomes attractive for users. From the point of view of e-formalization, this also provides the government with multiple ways to check on formality and registration of workers and enterprises.

   With such an emphasis on digitalization, there are also two significant ways to mitigate the risk of creating a societal digital divide. The first is by encouraging and providing IT education. Estonia invested in this – as elucidated in Section 3 – early on so that none of its citizens would get left behind. Second, even with such e-literacy, there may be sections of the population who prefer to go to the government office. Such options are still available and Estonians can benefit from shorter queues and waiting times since the rest of the population have gone digital.

4. **Reducing the impact of legacy systems**: Putting in place e-formalization policies require a different mindset for approaching digitalization which can be hampered by previous legacy systems. One element which played to Estonia's favour was its lack of legacy systems at the fall of communism to impact the way its digital infrastructure was put in place. Because it had removed previous Soviet bureaucrats from power, the country started with a relatively blank slate. By contrast, more developed societies with well-functioning bureaucracies have little incentives to go digital because the current system works – albeit slower, less efficiently and at a higher expense. This constraints of legacy systems, however, is something Estonian officials are vigilant about three decades after their own digitalization process started – "good is the enemy of the best".[83]

   Linked to the importance of being unhindered by legacy systems, implementing e-services is *not* about the digitization of paper processes but rather about rethinking the whole process.[84] This ability to think and conceptualise e-services as fundamentally different than paper processes is vital to making e-services work. Previous Undersecretary for Tax and Customs Policy, Dmitri Jegorov, illustrates this well,

> The car was not invented by constantly improving the horse and carriage. The electric bulb was not invented by improving the candle…it is indeed important to throw away a whole process and start anew.[85]

   Therefore, addressing issues surrounding the formalization of economic units and of employment would require creative thinking as well as an awareness of how previous institutional structures and legacies could hinder the digitalization process.

82 Vassil, "Estonian E-Government Ecosystem: Foundation, Applications, Outcomes."
83 Jegorov, "Interview with Susan Divald."
84 Marcus, "Interview with Susan Divald."
85 Jegorov, "Interview with Susan Divald."

5. **Moderate financing through collaborations and small projects:** For many countries, the cost of implementing digital infrastructure may seem high. However, from the Estonian government's perspective, digital solutions also save money. For example, it is estimated that two per cent of GDP is saved per year because of the digital signatures.[86] Moreover, when Estonia was developing its IT infrastructure, it only invested approximately one per cent of its GDP, compared to other developed countries which invest approximately 2.5-4 per cent of GDP in IT.[87] It is therefore not the case that e-services necessarily require overbearing financial commitments. One important principle in this regard is to have the right balance between e-service requirements and IT innovative solutions. The driver of the necessary IT application needs to be the policy-maker rather than the IT company. As one previous government official sums up,

> IT can do everything, but not everything is needed.[88]

Estonia's approach has been to finance its digital infrastructure and digital innovation through small steps. The culture surrounding innovation is one that believes it is "fine to try and fail, but try fast, fail fast. Don't fail big … keep the projects small."[89] Moreover, there was collaboration between the public and private sector which also helped to cover costs, such as for the Look@World initiative and in current Covid-19 pandemic measures.[90]

Looking to the future, IT solutions will continue to evolve as will the range of e-government services. For example, Estonia is currently implementing a more pro-active approach to e-government by focusing on 'life events' such as buying a house or having a child. Once these events are registered, it sets off a series of government actions such as birth certificates and school enrolment. The person can then change the provisions if they disagree or prefer a different school, for example, but the general trend is to make things as easy as possible. Another element receiving increased attention is cyber hygiene.[91] Whilst most of the population is computer literate, not everyone is aware of hackers, spam emails etc. It is therefore important to keep in mind that e-solutions do not take place in a static environment but in one which is continually developing, with new challenges as well as opportunities for innovative solutions.

The vast range of solutions implemented by e-Estonia as covered in this case study shows how government commitment to IT solutions can address issues of informality across different countries and development contexts. E-formalization policies – such as e-tax, e-business, entrepreneur accounts, and employment registers which are also linked to reception of social protection benefits – can significantly incentivize citizens to formalize their economic activity. Such policies can be part of the solution to ensuring decent work and productive employment for all.

86 Government of Estonia, "E-Identity."
87 Linea Larsson, "E-Estonia: The Information Society Since 1997," Centre for Public Impact, 2019, https://www.centreforpublicimpact.org/case-study/e-estonia-information-society-since-1997/.
88 Jegorov, "Interview with Susan Divald."
89 Õnnik, "Interview with Susan Divald."
90 Government of Estonia, "Digital Solutions from E-Estonia to Combat COVID-19 Crisis."
91 Government of Estonia, "Cybersecurity Strategy: Republic of Estonia," 2019, 15, https://www.mkm.ee/sites/default/files/kyberturvalisuse_strateegia_2022_eng.pdf.

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