Abstract

The project aims to collate a range of good practices from Estonia, Finland, Germany, Romania, Bulgaria, Republic of Moldova, Hungary, Italy and other European countries in the domain of digital LPA and reform processes, and to place these examples at the core of a series of forums designed to stimulate debate, catalyse change and generate more efficiency in LPA work, especially on the challenges that Europe is currently facing. This will complete the work of the Renew Europe Group in the European Committee of the Regions who are already working on a reform and digitisation agenda for local administration.

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Estonian ID card and reader.

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The European Liberal Forum (ELF) is the official political foundation of the European Liberal Party, the ALDE Party. Together with 46 member organisations, we work all over Europe to bring new ideas into the political debate, to provide a platform for discussion, and to empower citizens to make their voices heard.

ELF was founded in 2007 to strengthen the liberal and democrat movement in Europe. Our work is guided by liberal ideals and a belief in the principle of freedom. We stand for a future-oriented Europe that offers opportunities for every citizen. ELF is engaged on all political levels, from the local to the European.

We bring together a diverse network of national foundations, think tanks and other experts. At the same time, we are also close to, but independent from, the ALDE Party and other Liberal actors in Europe. In this role, our forum serves as a space for an open and informed exchange of views between a wide range of different actors.

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Introduction.

Digitalization of public services at the local level

The EU Commission presented a vision for Europe's digital transformation by 2030 earlier in 2021[1] which encompassed 4 key areas: skills, digital transformation of businesses, secure and sustainable digital infrastructures and digitalization of public services. Progress in these 4 areas should constitute Europe's Digital Decade.

The performance indicators set for public services within these targets aim at having 100% of key public services online, 100% of citizens having online access to their medical records and 80% of citizens using digital ID. The Digital Economy and Society Index (DESI)[2] acts as a shared monitoring system to measure progress towards these targets.

Digitalization of public sector and governance is mostly carried by a notion of increased efficiency of public service and is less so a question of redefining or rethinking governance in the 21st century. And rightly so, as the technologies that are put in use for public good and the delivery of services are only the enablers of policy goals set by different levels of governance.

However, in the continuing struggle of COVID-19, the importance of trust citizens place in their governments is an increasingly important indicator to keep track of. The Global Trust Imperative[3] – a Boston Consulting Group and Salesforce report of 36 countries – found that 87% of respondents feel more trust towards their government if they had a great digital government experience.

Central governments carry a large role in digitalizing public service from the perspective of setting nation-wide policy and enabling the emergence of a digital ecosystem (such as for digital identity, data exchange or shared services). Yet local government is the closest level of governance to the citizen and one where the relationship between the citizen and public sector should be the most immediate.

This paper looks at digitalization of public services at the local level and uncovers insights from 6 countries in Europe: Germany, Estonia, Romania, Hungary, Moldova and Finland.

1 European Commission, Europe's Digital Decade: digital targets for 2030 https://ec.europa.eu/info/ strategy/priorities-2019-2024/europe-fit-digital-age/europes-digital-decade-digital-targets-2030_en

2 The Digital Economy and Society Index https://digital-strategy.ec.europa.eu/en/policies/desi

3 Boston Consulting Group, The Global Trust Imperative https://www.bcg.com/the-global-trust-imperative

The state of affairs.

Digitalization of public services at the local level in Germany

575 is the magical number. 575 administrative services should be online by the end of 2022. This plan is based on the so-called "Onlinezugangsgesetz (OZG)"[4], the Online Access Act, and just one part of Germany's ambitious and intergenerational plan to transform its administration. There are plenty of reasons why Germany will fail in fulfilling its goal to digitalize the mentioned

575 administrative services and also in transforming the whole administration in the near future. A few shall be demonstrated in this paper.

Germany has a lot of potential in creating a digitalized administration in government – especially with a high standard of data protection and privacy. But as the administration has grown over centuries, this project will take longer than one might expect, especially during these fast-moving times. The Corona pandemic helped to create public interest in the transformation, modernization

and digitalization of the administration, as Germans recognized, that there can be occasions when it's more than helpful to organize one's personal administrative affairs from home. They realized, too, that it's necessary to digitalize the administration to provide the best public service – quick, based on (real-time) data, and with the ability to counteract with political measures, if necessary.

The digitalization of Germany is far from good and far from easily been made. But due to the pandemic, the end of 16 years of the Merkel area and the high possibility for a new future-oriented and progressive government that knows about the importance of digitalization for democracy itself and the need for a fundamental administrative and structural reform holds hope for big steps in the digital transformation of the administration and government.

4 https://www.gesetze-im-internet.de/ozg/

Understanding Germany – Different levels of responsibility

a) Not a front-runner: Status Quo of eGovernment in Germany

The Corona pandemic revealed to many Germans what they already suspected: The administration, especially schools and health offices, are hardly digitized. There was horror and astonishment when people learned through the press that the standard communication channel in health offices is the fax.[5]

In Germany, the data of daily Corona infected persons are still transmitted by fax and entered manually into Excel tables. In general, Excel lists are still a widely used "software" or "database" in municipalities and offices. In the districts of Berlin's capital, the digitalisation of the offices is sometimes so catastrophic that the district office of Neukölln asked in autumn 2021 for documents to be submitted in writing[6], as storage and printing capacities were limited.

But it is far from being this bad everywhere in Germany. In fact, the picture of the digitalisation of German administrations is more differentiated and there are exemplary cities and municipalities.

And even if we don't want to paint a dark picture here, it must be stated that last year the satisfaction of Germans with eGovernment services fell dramatically - by a full 15 percent to 47 percent, according to a study by the Initiative D21[7]. In the ten years that the civil society organization has been publishing the eGovernment Monitor, there has never been such a dramatic drop. This is possibly due to the fact that so much was revealed in the pandemic year and the need for online services from the state increased, since the authorities and offices were also closed or only received people to a limited extent.

In general, only half of Germans use eGovernment services (which also includes downloading forms that then have to be signed and sent in by post). Likewise, half of the Germans find it more difficult to handle administrative procedures digitally than to make purchases digitally. This also becomes clear when you look at what exactly the problem is for younger people in particular, i.e., people under 50, who use eGovernment services more frequently. Apart from the lack of digital existence of a needed service, it is usually also not discoverable, if

5 https://www.dw.com/de/gesundheits%C3%A4mter-mit-papier-stift-und-fax-gegen-corona/a-56347106
6 Press: https://checkpoint.tagesspiegel.de/telegramm/6PEtuyxmwfBv5ct4fPslWc; Original: https://www. berlin.de/sen/bjf/service/dienstleistungen/service.967320.php/standort/123602/
7 https://initiatived21.de/egovmon21/

it does exist, and then there is the lack of user-friendliness or consistency. Very often, digital services are only online forms that have to be printed out afterwards.

In Germany, the digitisation of the administration is often viewed from the perspective of the benefits for citizens. Yet it also has enormous advantages for the administration itself, which should not go unnoticed. For example, it makes the administration more efficient, services can be provided more quickly, and governments and politicians can act in a much more demand-oriented manner based on existing data and the information generated from it. Evidence-based policy is not only useful during a pandemic.

When people in Germany talk about the digitalization of the administration, they always emphasize that analogue access must be kept available for people who do not want to use digital services. This is accompanied by the concern that the digitalization of the administration would cost jobs in the administration.

The fact that it is not jobs but certain activities that are likely to be eliminated would provide a much more differentiated picture of digitization and what it entails. Administrative staff could thus have more time for non-standard cases or people who want or need personal advice. It must also be taken into account that in Germany in particular, due to demographic change, it is more likely that administrative positions will no longer be filled than that people will lose their jobs[8].

It should also be noted that the debate in Germany has so far tended to revolve around the electrification of administrative services. This is because the Online Access Act is primarily about digital access to services that are to be mapped digitally, but not about a real digital transformation of the administration and its services (for example through the use of artificial intelligence).

b) The German Ecosystem

The German ecosystem of the structures and the responsible bodies to transform the administration can only be outlined here very briefly. The structures for implementing the Online Access Act (Onlinezugangsgesetz, OZG) are spread over several levels in a federal system. In Germany, the principle of local self-government applies. This means that the federal and state governments cannot dictate to the 11,000 municipalities in Germany what they have to do and which digital product they have to use, for example. And although the plan is for individual municipalities to develop digital services in the sense

8 https://www.bmi.bund.de/DE/themen/oeffentlicher-dienst/arbeiten-in-der-bundesverwaltung/ demografiestrategie-oed/demografiestrategie-oed-node.html ; https://www.capgemini.com/de- de/2021/05/it-trends-public-sector-demografischer-wandel/

of the OZG and for others to copy them and thus also implement them, no one can dictate to a municipality that it must use an existing solution and not rely on its own development. Standardisation will not be achieved in this way. Municipalities are responsible for all services that are close to the citizens. For example, they provide portals for the digital registration of dogs, for the reimbursement of daycare fees or the use of sports and leisure facilities. The Länder generally have sovereignty over decisions in the areas of education, media, police and justice. The federal government, on the other hand, is responsible for everything that has to be regulated across the Länder, such as the federal police, federal courts or air traffic control.

A graphic by the Normenkontrollrat[9] (Council for the Control of Standards) achieved sad notoriety because it vividly depicted the complexity. In addition to the federal government, the Länder and the municipalities, the European Union of course also plays a role, as do bodies and spun-off public enterprises (institutions under public law), which are supposed to contribute to the coordination and implementation of the OZG.

The IT Planning Council, which brings together the CIOs of the Länder, the CIO of the Federation as well as municipal umbrella organisations, should be highlighted here. To support it, the FITKO (Federal IT Cooperation) was founded in 2020 to provide organisational and technical support to the IT Planning Council. 40 positions are available for this purpose.

Around the official structures - which cannot all be listed here because they are too extensive and complex - there are numerous initiatives, associations and research institutions, all of which deal with the topic of administrative modernisation and digitisation, as well as smart cities. Above all, various networks are being formed from the administrations themselves, which bundle competence and commitment in order to ensure the urgently needed impetus for progress in the challenging tasks.

c) The OZG (Onlinezugangsgesetz) - Online Access Act

The Online Access Act was passed in 2017 to, among other things, make administrative services available digitally by the end of 2022. 588 services were identified that are to be digitised under the OZG.

Responsibility is divided between the federal government, the states and the municipalities, with the states and municipalities accounting for the largest share of 379 services. The federal government is responsible for 110 services, and there is mixed responsibility for 99. The implementation of the OZG is

9 https://www.normenkontrollrat.bund.de/resource/blob/72494/1783152/14635b15fe7f6902039abcd6 53de6c61/20200909-monitordigitaleverwaltung-4-data.pdf p. 6

proceeding slowly and timely implementation by the end of 2022 cannot be expected.

Within the framework of the OZG, subject areas were defined in which the state provides services. For example, "Immigration and Emigration", "Family and Children" or "Taxes and Customs". Each federal state, in cooperation with the responsible federal ministry, has undertaken to develop prototypes for the services of a topic area in so-called "digitalisation laboratories" and to identify legal adaptations. In addition, the digital services developed on this basis are then to be made available to all federal states or municipalities. This division of labour is progressing rather slowly.

Best Practices in Germany

In Germany 11.000 muncipalities, there is no single municipality or city that can be called exemplary when it comes to digitalization. Many municipalities are extremely exemplary in individual aspects so that they can be copied and learned from. This means that in order to be able to present best practices for other states or other municipalities, it is first necessary to identify the areas in which one would like to bring about improvements and to look for a role model. Nevertheless, three examples are given here as a first:

The city of Ulm has created a creative space where administrative staff can get involved and work on innovative ideas - according to the motto: just do it. Something that is still new for administrations, in which they have little experience.[10]

The state of Bremen, responsible for the digitalisation of services in the area of family and children, has, for example, very successfully digitalised services for parents, which are now being tested live in the state and will then be available for use by other states[11]. The ELFE app eliminates the need for parents to go through the authorities after the birth of a child. Parents give their consent online to the exchange of data already held by the authorities (once only).

The applications for a birth certificate and for child and parental benefits are filled out and processed automatically. All documents are sent by post (still necessary) and benefits are paid automatically.

The city of Darmstadt has been awarded the title "Digital City" by the industry association Bitkom[12]. In several (model) projects, it is addressing the question

10 https://www.egovernment-computing.de/stadt-ulm-eroeffnet-kreativraum-a-932065/
11 https://www.egovernment-computing.de/freie-fahrt-fuer-elfe-co-a-983422/
12 https://www.faz.net/aktuell/rhein-main/wirtschaft/wieso-darmstadt-bei-der-digitalisierung-vorne-ist-17523865.html

of how the city can become more environmentally friendly and citizen-friendly through the use of technology and data. In addition, concepts for more citizen participation are being tested, for example through gamification. Thanks to a network of sensors, Darmstadt was the first city to provide an urban data platform with real-time data on pollution, ozone levels and commuter movements.

Excursus: Cybersecurity

In its current situation report, the Federal Office for Information Security (BSI) has described the cybersecurity situation in Germany as "tense to critical". More and more attacks - especially successful ones - are taking place on critical infrastructures and administrations[13]. The sad highlight in 2021 was probably the cyberattack on the University Hospital Düsseldorf[14] at the beginning of the year, in which a patient died due to failed IT and emergency patients could no longer be admitted.

But the cyberattack on the Anhalt-Bitterfeld district in Saxony-Anhalt[15] also made headlines. After all, this was the first time in Germany that a disaster was declared due to a cyberattack after an attack with ransomware. The press coverage perhaps made it clear for the first time why cybersecurity is so essential - especially for the administration. Social benefits could no longer be paid out, cars could not be registered and passports could not be applied for.

The attack was not the first and will certainly not be the first. However, it stands out because of the declaration of a state of emergency and because of the necessary support from the German Armed Forces to help with forensics and the reconstruction of the IT infrastructure. But the frequency of ransomware attacks on cities and municipalities is also steadily increasing[16]. In autumn 2021, for example, the IT of the cities of Schwerin and Witten was paralysed[17] within a few days.

It is important to mention that cybersecurity has so far only played a very minor role, especially in politics. Although cybersecurity is a topic and the federal government of the years 2017-2021 introduced laws that deal with the topic, they did not really bring cybersecurity. The need to keep open the possibility for security authorities to intervene was too big[18]. Furthermore, the requirements for

13 https://www.bsi.bund.de/DE/Service-Navi/Presse/Pressemitteilungen/Presse2021/211021_Lagebericht.html
14 https://www.wired.co.uk/article/ransomware-hospital-death-germany
15 https://www.dw.com/en/rural-german-district-declares-disaster-after-cyberattack/ a-58227484
16 https://www.bsi.bund.de/DE/Service-Navi/Presse/Pressemitteilungen/Presse2021/211021_Lagebericht.html
17 https://kommunal.de/cyberangriffe-stadtverwaltungen-experten
18 https://netzpolitik.org/2020/der-staat-sollte-alle-it-sicherheitsluecken-schliessen-manche-laesst-er-lieber-offen/

manufacturers of critical infrastructure in the IT Security Act are not sufficient. With them, security policy concerns disappear behind economic interests, especially with regard to the expansion of 5G[19]. Politically, the desire to provide secure IT infrastructure but still keep access points open, i.e. security gaps, in order to be able to take action against terrorists and organised crime, too often prevails.

Security through encryption, security in spite of encryption" is the popular phrase that illustrates the discrepancy in this respect. Politicians should also focus on a consistent, defensive cyber security strategy that consistently relies on encryption. After all, cybercriminals are highly professional actors who now - as in the case of Anhalt-Bitterfeld - not only encrypt data with malware and thus make it inaccessible but also extract and publish it beforehand to generate even more pressure for ransom demands. However, it is imperative that citizens have confidence in their administration that their data, some of which is highly sensitive, is safe there. All the more so if the digitalisation of the administration is to progress.

Optimistic Outlook: GovTec and Startups as a key driver for the state's digitalisation

As mentioned above, there are numerous associations, initiatives and research institutions that deal with eGovernment in Germany and want to bring this forward[20]. There are also large conferences that deal with smart cities and administrative modernisation and digitisation. Of course, this is also a huge business field. In addition to numerous consultancies, the GovTec sector is also becoming more and more important and start-ups are emerging in this area.

The fact that there is not only a lot of potential here for tech companies from an entrepreneurial perspective, but also for the administration itself, is clear from the "GovTech Campus" association founded in 2021 by the federal government, companies, the Federal Agency for Leap Innovations and a Fraunhofer Institute, as well as the state of Hesse and the city of Hamburg[21]. Its aim is to bring the start-up scene closer to the administration. Because the exchange between the start-up scene and the administration still fails in many cases. This is also because tenders for digital solutions to be purchased often do not fit these young companies.

19 https://www.faz.net/aktuell/politik/inland/gutachter-ueben-scharfe-kritik-am-it- sicherheitsgesetz-17222590.html
20 E.g. Kommunale Gemeinschaftsstelle für Verwaltungsmanagement (KGSt) – Verband für kommunales Management, VITAKO e.V., Initiative D21, Fraunhofer IESE, GovTech Campus
21 https://www.behoerden-spiegel.de/2021/07/02/govtech-campus-in-berlin-gegruendet/

In conclusion, it can be said that although citizen satisfaction with the services provided by the state is declining sharply, the digitalisation of the administration is finally gaining momentum. On the one hand, because of the sharp drop in satisfaction and the revelations from the Corona pandemic, the necessary pressure is finally being exerted on politicians by society. On the other hand, because the pressure is also coming more and more from within the administrations - from young employees who want to work in a modern working environment and from politicians who have to make better decisions. That the importance is increasing is also shown by the fact that the first of the 22 working groups negotiating the coalition agreement[22] of the new federal government after the 2021 parliamentary elections is dedicated to the topic of "modern state". In addition, the discussions about digital sovereignty and the necessary strengthening of European tech companies have also given the debate a boost.

Policy Recommendations

1. There is a need for change in the way administrations work and allow innovation. The task of administration is to act correctly, to ensure consistency and reliability. Not the ideal environment for innovation and disruption. And yet it must reconcile both. This requires, above all, appropriate leadership on the part of those in charge, as well as the space and opportunity to fail.

2. Cities and municipalities must learn even more from each other and cooperate with each other. It is no longer appropriate for everyone to develop their own services or operate their own data centres. Functioning solutions may and must be copied and used elsewhere. The exchange of best practices is essential and must be coordinated more strongly.

3. Companies from the GovTech sector must be more involved. Companies, research and administration must cooperate more and work together on solutions. This is also necessary to ensure Germany's digital sovereignty. With the appropriate political will, European tech companies can also be promoted through targeted investments if the state is a reliable customer and bulk buyer.

4. Cybersecurity must be the top political goal in digitalisation, not only of the state itself but also of companies and society as a whole. Digitisation is only successful if it is secure and citizens do not have to fear for their data.

22 https://de.wikipedia.org/wiki/Liste_der_Teilnehmer_an_den_Koalitionsverhandlungen_zwischen_ SPD,_B%C3%BCndnis_90/Die_Gr%C3%BCnen_und_FDP_2021

Moreover, they must be able to rely on their state being functional and not susceptible to blackmail. This requires not only a legal framework, but also financial resources and adequate pay for the professionals in the administration.

5. Developments need speed and must have the citizen in mind. It cannot be that existing eGovernment services are not used because citizens cannot or do not want to use them because they are not designed to be user-friendly. This also becomes important when one thinks of the developments of digital identities and sees how advanced the offers of large US American tech companies already are. If one considers digital identities to be an important part of digital sovereignty, neither developments nor measures for acceptance - which also include communication and marketing - should be neglected.

6. It is also important to involve critical civil society, which is involved in developments at the municipal level as well as in federal projects such as the Corona warning app. It should not be seen as an impediment, but as a corrective, that can help to find better solutions as well as broader acceptance.

7. The answer to the "why" of the digitalisation of the administration should not be forgotten. It is not being digitalised because it is in vogue at the moment, but because it has to be up-to-date and able to act efficiently and reliably. But even that is not an end in itself. There is something much bigger at stake in all this: people must continue to be able to trust that democracy will continue to function in the 21st century, that it is up-to-date in all facets and that it can also cope with monumental changes such as the digital transformation.

The state of affairs.

Digitalization of public services at the local level in Estonia

In Estonia, digital services for local authorities use the same elements of the ecosystem as all public services, 99% of them being digitized[23]. At the core of the functionality of these solutions is a system of technological, legal, and institutional elements that facilitate the independent and decentralized development of eGovernment applications by public and private institutions.

In Digital Economy and Society Index 2020[24], Estonia consistently ranks above the EU average, with leading positions regarding government services online, pre-filled forms, 93% of the people using them, European Union average being 67%. Most Estonian citizens are using mobile broadband connection and the internet coverage is seen as a social right already.

The main elements of the Estonian digital ecosystem are digital identification, X-Road interoperability platform, supportive legal framework and protection of personal data.

Government-wide digital ecosystem

Digital identification and the possibility of applying the digital signature.

Estonia's success in providing online public services is primarily based on the widespread use of electronic identification cards. Identity cards with the possibility to apply digital signature (e-IDs) are mandatory for all citizens, are valid for 5 years period, and are used for both digital and physical identification, including travel and identification in most European countries.

The Estonian e-ID card was introduced in 2002, is held by 98% of Estonian citizens, and uses ECC 384[25] public encryption certificates. With the help of a card reader (integrated into many computers) and a computer connected to the internet, citizens can use two basic functionalities provided by the ID card, namely, personal authentication and digital signature.

23 E-Estonia Briefing Centre. https://e-estonia.com
24 DESI Index 2020. https://wayback.archive-it.org/12090/20200704052344/https://ec.europa.eu/digital- single-market/en/desi
25 Estonian Information System Authority. ID specialized website. https://www.id.ee

In addition to the ID card, there are two eID solutions for mobile phones and smart devices. Mobile-ID is an integrated SIM card in the mobile phone and Smart-ID is a way of digital authentication that uses a free online application. Currently, all digital services at the local level are accessible with the first 2 options: ID card and Mobile ID and a permanently increasing number of e-services, through the Smart-ID option. There are currently more than 225,000 Mobile-ID users in Estonia, though Smart-ID solution, from the same company, which has 580,000 users, has proved to be more popular.[26]

Interoperability and data exchange

X-Road interoperability platform is a complex and secure internet-based data exchange system that allows multiple state and private information systems to communicate and exchange data with each other. X-Road is an efficient and fast data exchange platform, but at the same time, it has no monopoly on individual databases belonging to state or private institutions that connect to it. The system is designed in such a way that each interconnected institution can securely share data with other registered entities, if necessary. In the case of digital services at the local level, X-Road ensures the secure exchange of data between various registers and institutions being it state or private ones. X-Road platform is developed by Cybernetica, a private company that also provides a similar commercial platform, called Cybernetica UXP (Unified e-Xchange Platform.[27]

Protection of personal data and legal framework

The Estonian e-government ecosystem is strictly regulated[28], to provide a secure legal framework for the security and protection of personal data, stored in the population register or other government databases. Together, these rules govern the processes by which institutions, individuals, and companies can request and receive access to information stored in government databases and thus build new electronic public services, using information already stored in state databases.

The once-only principle[29] stipulates that state institutions do not have the right to repeatedly request the same personal information from a citizen if it is already stored in any of the databases connected to X-Road. Using this

26 ERR, Estonian National News Broadcaster, 09.08.2021. https://news.err.ee/1608301968/state-hoping-to-introduce-new-solution-to-replace-mobile-id
27 Comparison of X-Road and Cybernetica UXP. https://cyber.ee/products/secure-data-exchange/ materials/uxp-xroad-comparison.pdf
28 Estonian Personal Data Protection Act. https://www.riigiteataja.ee/en/eli/523012019001/consolide
29 Exploring and Demonstrating the Once-Only Principle: a European perspective. Robert Krimmer and team. https://dl.acm.org/doi/10.1145/3085228.3085235

principle avoids possible errors that may be generated by the reporting of data by various institutions. Another fundamental principle is that every citizen is the owner of his data and has instant access to all access data by any person or institution, and in case of unauthorized use of them a government control mechanism is established.

Historic developments of digital services for local authorities

Digital services for local authorities and their residents were developed together with all infrastructure and national services with various success in different municipalities of Estonia, keeping in mind various financial, human resources, and possibilities but also political leadership at the local level to develop and implement them. The responsibilities for the implementation of the digital services at the local level lies on the municipalities themselves. However, keeping in mind the need for their strong interconnection with government databases, technical and security elements, the cooperation with other state and private institutions is essential.

Back in 1995-1997, the Estonian Government understood that large scale digitization of the public services at the local level needs support from the state and after a large scale assessment of the needs of local authorities, in 1997 the Ministry of Interior established a specialized company to develop interconnected digital services for local authorities. The same company (Andmevara)[30] was an authorized processor of the Estonian Population Register in 2002- 2015[31]. At the same time, various municipalities started to develop their solutions, with the support of private companies using all elements of the ecosystem described in chapter 1.

An important milestone in the development of digital services was the 2017 administrative reform. The reform decreased the number of municipalities from 213 to 79, making them bigger and more capable of designing and financing new solutions. Another important factor is the abolishment of all 15 regional local administrations (county administrations) and the establishment of a unified Association of Municipalities of Estonia, instead of several previously existing associations. Currently, the new association plays an important role in the management of existing solutions, development of new ones, and lobbying for their permanent development, on behalf of all municipalities. As the goals and possibilities of each municipality differ, the new solutions are also quite various across Estonia.

30 Andmevara website. https://www.andmevara.ee/en/tutvustus

31 Estonian Land Board. https://maaamet.ee/?lang_id=2&page_id=52&menu_id=51&no_cache=1409640765

Digital solutions for local authorities

In Estonia, there is a large number of digital solutions for municipalities the most important and used being those interconnected with the main state registries (population, land, property, etc) but also a number of databases developed by municipalities themselves. Some of them are functional for vast majority of municipalities and developed in centralized way and some are developed by one or a group of municipalities.

Of course, larger towns and municipalities has more potential and resources to develop their own solutions. Some of private companies are developing online solutions which are used by a number of municipalities (in transport sphere, for example). Many solutions available at the national level are widely used at the local level too (e-School, e-Kindergarten, Patient Portal and e-Prescription, e-Tax, e-Business etc). Their widespread use by most of the citizens represents a good ground to develop new solutions at the local level too. Vast majority of application forms for residents of municipalities are already available in pre-registered e-forms, which considerably simplifies the application and management process of applications. Some of the well known digital solutions developed for local authorithies are:

Kovtp service portal for local governments is a website content management solution targeted at both the private and public sectors, turning a conventional website into a service portal, providing a fixed price, firm concept, and simple content management. KOVTP offers a large spectrum of possibilities and the whole layout of the information and the proposed information architecture are primarily based on the statistics of existing websites and the suggestions of the usability experts. KOVTP has a working interface with other applications, turning a conventional home page of any municipality into a service portal. It has an embedded mapping application, interfaced with the mapping application of the Land Board[32] which enables the management and displaying of information and services through the mapping application. The content management is in the Estonian language and there is no special knowledge required to integrate external services. Currently, the KOVTP portal is used in more than 165 institutions[33].

Kovmen is an extension of KOVTP designed to ensure a process-based approach to activities, at the same time interacting with other information systems, applicants for services, and organizations. Through KOVMEN, municipalities officials can involve all parties in the ongoing procedure for the services

32 Estonian Land Board. https://maaamet.ee/?lang_id=2&page_id=52&menu_id=51&no_cache=1409640765

33 KOVTP platform interface. https://www.kovtp.ee

provided by the local government, advise the applicant, consult with their colleagues and coordinate the application and associated documents with other co-executors. All related processes are fully digital within the institution, which standardizes the application form and converts the information fields into data. KOVMEN is used for many services for municipalities, including the application for public transport travel fare concessions, hobby school allowances, home childcare allowances, etc[34].

Volis is an information system for municipal councils and governments which was created to facilitate the work of councils and governments, making it quicker, simpler, and cheaper. The system facilitates the management of the public business, making it more open and involving members of the public in the decision-making process. Through VOLIS, the local governments could conduct meetings and sessions of the council or government, automatic recording of minutes and arranging of voting, virtual participation in sessions, submitting proposals or sending proposals submitted by residents for public voting, conducting polls, recording events taking place at a session on video and making this available to the public afterward, etc[35]. A VOLIS functionality is used for participatory budgeting at the local level too. Currently, VOLIS is managed by the Estonian Association of Municipalities which unites the vast majority of Estonian local authorities[36].

Delta document management software (DMS) is a web-based solution that implements all functionalities required for the document lifecycle and which is ideally suited as the document management tool for an organization. The simple and user-friendly user interface allows the pending documents associated with a user to be located quickly. The flexible user rights system enables the viewing or modifying of documents to be restricted as required, and the editing of MS Office or OpenOffice documents is possible using local software of various municipalities[37]. Currently, DELTA is implemented in 30 local governments.

Anna Teada (LET ME KNOW, in translation from the Estonian language) is an application that allows users to inform local municipalities or the Road Administration of Estonia about problems they notice (i.e. garbage lying around in the forest, streetlight which is not working, illegal parked cars, dangers in public spaces, etc.) by marking the location of the problem on the map and

34 KOVMEN Presentation by Janar Linros. https://www.slideshare.net/kaidopalu/kovmen
35 VOLIS platform interface. https://www.volis.ee/gvolis/?lang=en&kid=
36 Estonian Association of Municipalities. https://www.elvl.ee/kov-it-koordineerimine
37 SMIT (IT and Development Centre of the Ministry of Interior). https://www.smit.ee/et/delta- dokumendihaldussuesteem

adding a photo or short description to it. The application is currently available only in Estonian but users could insert the text in other languages too. Photo: a user identifies a problem which is sent automatically to the respective department in Tallinn municipality. Source: screenshot, made by the author, in ANNA TEADA desktop interface[38].

Tallinn`s Register of Plans was established to process design requirements, construction regulations, construction projects, detailed, comprehensive and thematic plans and to present information related to these procedures.

The mobile and web application of public transport[39] (timetables, online tracking, journey planner, city map). Accurate and easy to use, the app is the only official and reliable source that provides up to date (with a maximum of 30 seconds of delay) information about public transportation lines in Tallinn and other larger cities. In addition, you can see the live progress of buses, trams and trolleys on the web map.

The application for traffic cameras[40], as they cover all of the most important intersections in Tallinn, and the app provides the most relevant information about traffic jams.

The application for the one-time childbirth allowance[41], which you can do through the systems of the City of Tallinn, and where all you need to start the procedure is your electronic ID card and a computer at hand.

Supporting entrepreneurial initiatives[42] **platform in Tallinn** of private citizens for non-profit activities, where all you need to do is to submit your request filling in the relevant form and send out the application for funding.

Specific apps of the municipalities are developed, for example Elva Vald App[43] was created for residents of Elva municipality to connect the community and create even better engagement between the citizens and the municipality. Residents can ask questions, provide feedback, send pictures or messages, and get in touch with the city officials.

38 ANNA TEADA platform desktop interface. http://www.anna-teada.ee
39 https://transport.tallinn.ee/mobile.html
40 https://ristmikud.tallinn.ee/index.php/cams
41 https://www.tallinn.ee/Teenus-Birth-benefit-for-residents-of-Tallinn
42 https://www.tallinn.ee/eng/Teenus-Support-to-enterpreneurship-related-non-profit-activities
43 https://www.elva.ee/elva-valla-app

Future perspectives, challenges, and recommendations for the development of digital services for local authorities

After Estonia regained its independence, the municipalities had limited possibilities to implement digital solutions, due to several factors, including poor financing opportunities for many smaller municipalities, lack of qualified personnel within the local authority, lack of developed concepts on e-transformation at the local level. In 2007, the Government empowered the municipalities to develop their solutions and systems. At the same time, the

Government, through the special department within the Ministry of Interior and in strong cooperation with municipalities, started to create the critical systems for the use of all local administrations (KOVTP, VOLIS, KOVMEN, DELTA etc).

Keeping in mind the potential usability of a functional solution in different municipalities too, of key importance is the strong cooperation between rural and urban municipalities, involvement of ICT companies in this process, and strong leadership in promoting them, from the representatives of elected bodies. More coordination between municipalities in developing new services and consolidating some databases is needed and this effort could be lead by the Association of Estonian Municipalities, in cooperation with specialized state institutions and private sector. For example, nowadays, all municipalities keeps their databases about pets which consumes human and financial resources, especially, for smaller municipalities. Unifying these kind of separated databases into a single one could be one of the priorities.

The challenges in the implementation of various digital solutions at the local level still remain the same: lack of human and financial resources and various level of preparedness or leadership to implement them. Most municipalities clearly state that their goal is that their residents could apply for, or consume, their desired services using only electronic channels. To achieve that, even more cooperation between the municipality and citizens is needed, as well keeping in mind end-user expectation on how intuitive and functional they should be.

The state of affairs.

Digitalization of public services at the local level in Romania

Digital transformation is an inevitable process for the future of every society and every company. The global economy is in a state of accelerated development, based on digital technologies that must both develop and recover from the handicap caused by the health crisis.

Although Romania has important resources to be at the forefront of the digital transformation in the region, the process of implementing solutions is challenging, as it was until not so long ago, without a very clear strategy.

General overview

Prior to 2020, there was a small amount of public information regarding the progress of digitalization. The results were not clear and the progress was not visible in the interaction[44] between the government with the citizens, government to government, government to business. Among the reasons for slow digitalization was the lack of a single authority to manage all the digitalization processes.

The National Strategy on the Digital Agenda for Romania 2020[45], established an ambitious target, that by 2020, 35% percent of the population would use e-government solutions, but the figures showed a 6% ratio of adoption by 2018[46].

The costs of implementing different applications[47], especially at a local perspective ended up consuming bigger resources from public authorities and creating a false competition[48] among them.

The lack of interoperability of government-to-government systems led to a greater bureaucracy on the shoulders of both citizens and private companies, when interacting with the public authorities. Simple operations like selling a car or a property would involve several different institutions.

44 "CoronaDigitalizarea: Soluții de accelerare a interacțiunii online dintre stat și companii"
45 Strategia Națională privind Agenda Digitală pentru România – 2020
46 Study for the implementation of Digital Governance in Romania, PWC, 2018
47 Pe la câte ghișee trebuie să treci ca să radiezi mașina
48 Cum a transformat coronavirusul relația cetățeanului cu administrația locală, de la digitalizare la telemedicină

According to 2020 Eurostat statistics[49] only 10% of the Romanians have taken their information during the pandemic crises from official local authorities' websites, while the average for the European Union is 47% according to the same statistics.

The official statistics rank[50] the country on the 26th of 28 places of EU Member States in the Digital Economy and Society Index (DESI), covering the last positions both in 2018 and 2019. Minor changes were registered in the last few years, with four of the five dimensions examined, almost identical to those of the previous period. However, understanding the DESI 2020 will prove that Romania has all the attributes to be at the forefront of the digital transformation in the region.

Regarding the integration of digital technology, which includes the adoption of digital solutions by the local companies, Romania occupies the penultimate place. According to the DESI country report, only 23% of Romanian companies transmit information through electronic channels, compared to 34% - the EU average.

According to McKinsey[51], Romanian employees worked, on average, 1795 hours in 2017, 12.7% more than the employees of the 5 largest European economies and had a productivity of only 29 €/ hour, compared to 53 €/ hour, the average of the 5 strongest economies in the EU. Moreover, 50-54% of the workplace activities carried out by Romanian employees (4.4 million jobs could be digitized or automated), which would lead to a significant increase in the productivity and profitability of Romanian companies until 2030.

Romania is very advanced in terms of HCVN coverage, which is one of the relevant indicators for digital transformation and economic recovery, namely very high-capacity networks (HCV) and 5G technology. Romania is on the 14th place in the EU at digital readiness to use 5G networks, but is lagging behind with digital skills and underperforming in the digitalization of digital businesses and public services.

Shifting the focus from piles of papers to paperless municipalities

The challenges of the pandemic have been huge for local authorities all over the world. Cities addressed challenges determined by the lack of information in the first phase of the pandemics, the management of the crisis situation,

49 Ever more citizens get government information online - Products Eurostat News - Eurostat
50 DESI - Romania | Shaping Europe's digital future
51 Daniel Spiridon, Tomasz Marciniak, Jurica Novak, and Marcin Purta. The rise of digital challengers: Perspective on Romania, 2018.

the need for financial resources to be transferred from central authorities, the constant pressure for medical equipment and infrastructure. Also, the local authorities who are responsible for collecting and establishing local taxes, faced a slower revenue collection to local budgets[52], doubled by a significant increase in unforeseen expenses - masks, disinfectants, testing of officials, disinfection of public spaces, tablets for students.

The local public administration authorities[53] are in charge of providing services to the citizens but they have a solid connection[54] with central authorities. During the pandemics they were allowed to use the central database to provide services to citizens, a situation that was never met before.

Along with the threats and problems generated by the pandemic, came the opportunities for development and evolution. Those administrations which invested in digital solutions before the health crises, managed to evolve even further. Among the local authorities which already lead the digital processes is Cluj Napoca City Hall, which created in early 2018 the first virtual public servant, called Antonia[55]. In 2021, a number of over 140 requests can be fulfilled by this method.[56] Oradea is another leading municipality for digital processes implemented.

Digitization, a topic addressed at the level of a roadmap, but not seen as an emergency, in the vast majority of cities, becomes a topic addressed by the entire administrative system in Romania. Thus, we find ourselves today in a new context.

Main actors for digitalization

In the earliest[57] stages of the Covid-19 pandemics, the Romanian Government has issued a Decision[58] regarding the organization and functioning of the **Authority for the Digitalization of Romania**[59] ("ADR"). Thus, the Government has empowered the Authority for the Digitalization of Romania with the primary objective to support and contribute to the digi-

52 payment deadlines for taxes have been extended, therefore the share of income tax has decreased
53 local councils, city halls and county councils
54 https://www.legislationline.org/download/id/950/file/20fe61792d723a1bd6d25c0f882219f0.pdf
55 Antonia, the first virtual public servant in Romania
56 https://e-primariaclujnapoca.ro/registratura/cereri/
57 13 of February 2020
58 Decision no. 89/2020
59 https://rlw.juridice.ro/16520/romanian-digitalization-agenda-the-government-takes-one-step- forward-by-setting-up-the- authority-for-the-digitalization-of-romania.html

tal transformation of Romania's economy and society, and to implement electronic governance with regards to the Romanian public administration. The Agency has since started implementing a number of projects and established a roadmap[60].

In April 2020, the Government issued a Decision that extended the **National Electronic Payment System**[61], operable from ghiseul.ro, to all legal entities, including private companies, not only to individuals, as it was previously. By extending this portal, legal entities can pay, in addition to taxes to the state budget, other obligations due to other public institutions (e.g. fines, tariffs), if that entity is enrolled in the National Electronic Payment System.

Romania faced a two-month lock-down (state of emergency, 2020, 16th March to 15th May). During this period the real changes began[62], the most relevant being on the use of documents in electronic form at the level of public authorities and institutions. The adoption of a regulation on electronic documents and the use of electronic signatures imposed the obligation for all institutions to receive electronically signed documents - a major relaxation of the bureaucratic relationship of the citizen with the state, which was urgently implemented by the Tax Office and local administrations.

From the date of entry into force of the ordinance, public authorities and institutions were required to receive **electronically signed documents**, which was a game changer for the relation between local municipalities, citizens and companies.

In just a matter of weeks the authorities, namely the recently formed ADR, managed to develop and launch the platform for subsidized loans SME Invest[63]. Another development made during the state of emergency is the platform where companies could register their requests for help for technical unemployment (aici.gov.ro[64]), where in just one month, there were requests from 160.000 companies[65], a volume of information impossible without automation. The requests were processed rapidly.

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60 Autoritatea pentru Digitalizarea României a organizat conferința de încheiere a proiectului EGOV Stabilirea cadrului de dezvoltare a instrumentelor de e-guvernare - Autoritatea Pentru Digitalizarea Romaniei

61 The National Electronic Payment System (SNEP), also known as www.ghiseul.ro is the system through which Romanians can pay their taxes online

62 On 07.04.2020 was published in the Official Monitor the Emergency Ordinance no. 38/2020 about accepting online signature for all administrations

63 https://www.imminvest.ro/

64 operated by the Authority for the Digitalization of Romania

65 https://economie.hotnews.ro/stiri-telecom-24702963-povestea-aici-gov-platforma-pusa-dispozitie-statului- pro-bono-pandemie-dar-care-ulterior-generat-cheltuieli-publice-costuri-are-statul-acum-cat-folosita-este.htm

In a matter of weeks local authorities began the development of digital platforms and mechanisms to avoid direct contact with the citizen, from paying taxes to obtaining certain types of authorizations for local administrations.

More than seven million electronic documents were submitted in 2020 through the **Virtual Private Space**[66] which intermediates the interaction with tax authorities, double than the average of the last five years. Such documents include income certificates, tax attestation certificates, notifications or documents regarding the social contributions declared by employers. The platform will be improved for allowing access from mobile devices and for online visual identification.

The National Office of the Trade Register (ONRC) has extended the digital services offered to their customers, the private companies, with the intention to make the physical presence at the desk for the submission or receipt of documents the exception. **The National Agency for Cadaster and Real Estate Advertising**[67] (ANCPI) has expanded its online services and now most of the documents, including the land book extract, can be obtained without the in-person visit.

Romania's rural digital development

Digital skills in rural areas, starting from minus

A recent study upon the 2861 villages of Romania[68] and their specific needs has proven that human resources development is the biggest impediment in the digitization of villages. Following the study, we can observe that most communes have only an elementary website and two thirds of communes do not even use an official email address. From this up-to-date radiography, although discouraging, is worth noting that about 1/3 of the communes are planning to accelerate the digitization process[69] by implementing an impressive number of IT solutions, the same study reveals.

Online education and lessons learnt

Digitization of education. On a local level, schools are the attribute of local city halls, while the curricula is at the responsibility of the ministry. During 2020,

66 Official data from the Ministry of Finance MFP: Peste 7 milioane de documente electronice, emise prin intermediul SPV în 2020
67 București, 25.09.2020 – Semnarea documentelor în browser și plata cu cardul în aplicația eTerra – ANCPI
68 O treime din primăriile comunelor din România nu dispun de echipamentele IT necesare digitalizării (Holisun and Association of Communes of Romania, 2021)
69 By implementing automation solutions

numerous solutions were available, especially from private companies offering free solutions to help the continuance of learning. Edu Apps[70] has created a free platform, where schools, based on a single account, activate their free license packages offered by Google and Microsoft. With the help of various applications, students and teachers could continue the distance learning process without syncope.

Limitations - Even if providing the general framework, with all the determination and even with everyone's contribution (teachers, students, platforms available, software and hardware solutions), there is still a gap to fill, caused by the digital illiteracy of the wider population, mainly in rural areas and public servants. Education in Romania has taken place for more than a year online. It showed an unprepared digital system, teachers unable to adjust to new platforms, students with no access to digital education, and without the basic skills to even use any.

Successful Projects

The pandemic accelerated major changes in the public institutions and projects such as work from home regulations to the optimizing tax collection – a digital approach for the National Agency of Fiscal Administration.

Among the objectives of NAFA (ANAF) is the implementation of the SAF-T project (already started) which leads to a better tax collection in Romania. SAF-T, along with e-invoicing and connecting cash registers will offer to the Romanian State real time data and will contribute to reducing tax evasion and increasing the tax collection.

Romania started issuing electronic ID cards in August 2021 to align with the standards set at the European Union level. ADR opened the **National Electronic Payment System** - Ghiseul.ro for the interconnection with private payment and service platforms, respecting all the necessary security conditions. With support at all levels of the society, from political actors to private companies the platform managed to enroll 950 institutions, but the biggest outcome of the platform is that it managed to reassure the trust in digital solutions among the population. Since January 1st, 2021, Ghiseul.ro has collected as much money as it has collected during the first nine years, in total. There are a number of 1,1 million users and the number of transactions (128 million euro)[71] registered in 2021 is the total amount of transactions in the first nine years.

70 scoalaviitorului.ro is a free project developed on EU funds, in 2014, which had only 300 users before online school

71 https://www.ghiseul.ro/ghiseul/public

This only proves that the society can adjust to the digital solutions, when they re-establish the trust in the solution provided. Now, Ghiseul.ro is the first Romanian digital solution which will provide an application where the users will be able to log-in using biometric data[72].

Initiatives

The National Interoperability System plans to live stream in November 2021, destined to issue the fiscal attestation certificate for the Bucharest municipalities. The need for interoperability is a must since the public central administrations provide a number of 1900 public services[73].

PNRR - Romania relies on The National Resilience and Recovery Plan[74] to upgrade and develop initiatives. The digital transformation pillar (1.8 billion euros) has a single component, namely Government Cloud and digital public systems, and the one on Smart, Sustainable and Inclusive Growth for inclusion of two components, Tax Reforms and Pension System Reform and Sector Support private sector, research, development and innovation. Other investments in public administration digitization: digitization of the health system, the judiciary, public services, public procurement and labor and social protection.

The Government Cloud, once implemented, can contribute to positive change for municipalities. Some specific problems were identified during different public consultations[75]. Among them[76], it should be underlined that the Government

Cloud could resolve at least: costs reduction for public sector IT services, hardware, software and operations, for migrating services to new platforms, reducing the number of (redundant) applications and services in the public sector, reducing the time and cost for purchasing new services, implementing standard, updated and tested security solutions and so much more.

Conclusions

Increase the investments in digital solutions - The digitization of services in the next six years could lead to an increase in Romania's GDP per capita by 16.48% and productivity by 16.70%[77].

72 Vești bune: în curând atestare fiscală online și app Ghișeul.ro
73 according to The Romanian Digitalisation Agency inventory of the public
74 Romania's PNRR is structured on 15 components that cover all the 6 pillars provided by Regulation 2021/241 of the European Parliament and of the Council
75 https://sgg.gov.ro/new/wp-content/uploads/2020/10/Propunere-de-politica-publica-in-domeniul-e- guvernarii.pdf.
76 https://citymanager.online/despre-cloud-guvernamental/
77 According to a report by Deloitte, 2021

The interoperability - is a must factor to reduce bureaucracy and increase the results for a more citizen centered approach. De-bureaucratization begins with the reduction of the number of forms that a citizen must make in order to obtain an act or an authorization. Allow the development of those applications which can be integrated into the digital highway.

Transformation of the **Electronic Single Point of Contact** (EUPC) into the real communication interface between the citizen and the Romanian State. Any document submitted to the EUCP should have legal value and enter the legal documents circuit for all institutions.

Digital skills need to be developed in order to really benefit from the correct transposition of solutions at EU level, and both service providers - civil servants and school staff, and end-users need to have these digital skills.

The state of affairs.

Digitalization of public services at the local level in Hungary

With the **spread of ultra-high-speed broadband internet**, along with the rapid improvements in digital technologies and services, it becomes vital for local governments to increasingly provide "smart solutions" in the areas of healthcare, public utility services, the environment, transportation, and tourism. This enables local governments:

- **to efficiently provide electronic public administration and public services** (e.g. libraries, archives);
- **to communicate with their citizens through carefully designed**, well- structured, and user-friendly digital interfaces;
- **to make their internal processes paperless** and efficient;
- **to facilitate digital infrastructural developments** in the municipality;
- **to support the digitalization of local enterprises**;
- **and to play a greater role in fostering the digital skills** and literacy of local residents and entrepreneurs.

The digitalization of municipalities extends to the digitalization of the internal processes of municipal governments (back office), all their electronic interactions with local stakeholders (front office), the municipality's role in promoting digital developments aimed at helping local businesses, spreading digital skills, and improving infrastructure and other aspects encompassed by the concept of a smart city.

The determinants of digitalization: The digital readiness of local residents and businesses, and the responsibilities of local governments

In any country, the possibilities for municipal digitalization are significantly delimited by the following two factors:

- the **general level** of development in the given country;
- the exact scope of the responsibilities performed by the municipal governments: What the **level of centralization/decentralization** is in the given country.

Concerning the various indicators and dimensions of digital development **(the DESI index**[78]), **Hungary ranks in the top tier of European countries**

78 https://ec.europa.eu/commission/presscorner/detail/hu/ip_20_1025

only in terms of the development of its digital infrastructure. In terms of the DESI indicator "connectivity", Hungary ranked seventh among 28 European member states at the time. However, the availability and the **national coverage of cable and mobile (4G/5G) broadband services is still favorable** in Hungary.

For the time being, however, neither the public nor the business sphere has been able to properly take advantage of these favorable infrastructural conditions mainly because of a lack of motivation and necessary digital skills.

The digital readiness of the Hungarian public sector and the intensity in the use of digital services lag far behind the government's expectations. According to DESI 2020 report, **in terms of human capital (digital skills), Hungary ranks only 19th**, while in terms of the use of internet services, it was only 14th, and for the use of digital public services, it came in 24th.

The situation is worse still when it comes to the **digital performance of enterprises, another important potential target group of municipal level partnership and services**. In terms of the DESI 2020 indicator (the integration of digital technologies) that captures the state of electronic information sharing, the use of social media and cloud services, respectively, by enterprises, as well as electronic/online commerce, **Hungary was ranked in a low 26th place among the 28 countries surveyed**.

One factor that fundamentally determines the significance, functions, and target areas of municipal digitalization are the **responsibilities assigned to municipalities** in a given country. In this respect, the transformation of the Hungarian municipal system between 2010 and 2013 had a major impact: The **scope of responsibilities** within the remit of local governments was **transformed and substantially narrowed** after 2010[79].

The changes were most significant in the areas of municipal administrative services, public education, and public health services.

Municipal administrative services were transferred from municipal records offices to so-called government offices, local branches of the central government. Institutions of local pre-university education (primary and secondary schools, including technical and vocational schools) were placed under central control. Today, **the central government is predominantly in charge of all specialized healthcare** and social services that were previously within the remit of cities with sufficient capacities to perform such services or county-

79 Ilona Pálné Kovács: Az önkormányzati rendszer és a területi közigazgatás átalakulása 2010-2013; Magyar Tudományos Akadémia [The system of local governance and the transformation of regional public administration between 2010 and 2013] / Hungarian Academy of Sciences, Budapest, ISSN 2064-4515

level local governments. At the same time, inpatient care providers (hospitals), too, were taken over by the central government.

According to the Hungarian Act on Local Governments,[80] the following major local services and public responsibilities are left within the remit of Hungarian local governments:

- municipal development, municipal zoning, municipal operations (public cemeteries, public lighting, chimney sweeping, etc.);
- kindergarten care;
- social and children's welfare services and benefits;
- basic healthcare services (general practitioners, dentists, etc.), services aimed at promoting a healthy lifestyle, environmental health (e.g. public sanitation, pest control);
- cultural services (funding for libraries, public cultural education, and the performing arts, etc.),
- local environmental and nature conservation efforts, water management, water damage prevention, drinking water supply, and wastewater removal, treatment, and disposal (sewage services);
- management of the local residential housing stock and public spaces;
- cooperation in ensuring the public safety of the municipality;
- local public employment;
- responsibilities involving local taxes, economic planning, and tourism;
- sports, youth affairs;
- providing local public transportation;
- waste management;
- district heating services.

Municipal digitalization in a strategic context: Objectives and results

Over the past ten years, Hungarian digital strategies have increasingly focused on municipal digitalization. The Digital Renewal Action Plan adopted for the period between 2010 and 2014[81] only featured ideas concerning the development of digital municipal social spaces as well as intelligent local transportation systems.

The National Infocommunication Strategy adopted in 2014 set out the objective that at least three intelligent city projects should be launched in any of the following areas: e-health initiatives; intelligent transport systems; smart grids;

80 Act CLXXXIX of 2011 on Local Governments in Hungary (abbreviated as the Mötv in Hungarian)

81 https://infoter.hu/attachment/0003/2700_digitalis_megujulas_cselekvesi_terv.pdf

environmental solutions; smart cities, smart metering; and green IT (energy- efficient information and communications technologies).

National Digitalization Strategy

Taking things a step further, the **National Digitalization Strategy drafted in 2020** extends to many dimensions of municipal digitalization and also discusses in detail the results already achieved. Among the accomplishments in this area thus far, the National Digitalization Strategy's assessment considers the **creation and mandatory extension of municipal ASPs (Application Service Providers) as the most important one**. By 2019, **all Hungarian municipalities had joined this system**.

The ASP system, which was built with EU funds, provides a **unified platform accessible to all 3200 municipal governments** in Hungary. Through this system they have access to **cloud services** that feature the digital applications which they need to perform their various responsibilities, thereby boosting their ability to serve the public more effectively.[82] The range of accessible services is rather extensive and it includes a **file management system, a municipal government website, an electronic administration website** (with a service featuring the possibility to file forms online), a **real estate registry system, a municipal tax administration system, an industrial and commercial relations management system, as well as an inheritance and estate inventory system**.

One of the top short-term priorities in the National Digitalization Strategy is the **creation of a centrally-operated smart city platform service**, which the strategy wishes to extend to the entire municipal system.[83] This initiative, too, was likely inspired by the success of the ASP system. Once again, the goal is to set up a central, cloud-based ready-to-use service to support the digitalization of municipal governments.

This service would be structured modularly, adapted to the needs of the given municipality. Its use would make it possible to replace the existing isolated developments with a unified and integrated digital development project. The platform is being designed by the Lechner Knowledge Centre,[84] and it is currently still in the development phase. As of now, **test results gathered in Monor, a "smart model city" designated by the government, are being processed**.[85]

82 https://ec.europa.eu/isa2/az-%C3%B6nkorm%C3%A1nyzati-asp-mint-helyi-%C3%B6nkorm%C3%A1nyzatok-digitaliz%C3%A1ci%C3%B3j%C3%A1nak-j%C3%B3-gyakorlata-%C3%B6sszhangban-az_en
83 The antecedent was: Government Decree No. 252/2018. (XII. 17)
84 https://lechnerkozpont.hu/
85 Government Decree No. 2040/2017. (XII. 27)

Smart City

Concerning the course of future digital strategy, the National Digitalization Strategy commits itself to the **idea of the smart city as the future model of operation for Hungarian municipal governments**. Based on the National Digitalization Strategy's definition, a municipality may be considered "smart" when specific technological solutions became part of the city's everyday life, including transportation (parking), routine administrative matters (public administration), public utilities, the maintenance and use of public spaces, as well as other services, including social services. These services used by the public in their everyday life may eventually be combined to create a unified and coordinated system of urban operations.

Furthermore, the National Digitalization Strategy also proposes that a city is smart when the new developments are accompanied by new types of decision-making (participation-based decision-making) and organizational and operational solutions that help facilitate the adaptation to the needs of consumers. In addition to the more spectacular solutions, the underlying model of operating a smart city is based on ongoing digital information and data collection, data management, and the organization of municipal responsibilities based on the latter.

The smart operation of municipalities also requires a responsible business- oriented approach, which does not center on profits, however, but on savings that can be used to invest in developments that result in improved sustainability.

Smart city developments in practice

In Hungary, **we know of about 200 smart city development projects in total**.[86] The majority of Hungarian smart city developments **took place in the following major areas:**

- **Public digital information services** (e.g., publicly accessible digital geographic information systems in **Szigetszentmiklós, Újbuda, Törökbálint, Jászfényszaru, and Dunakeszi**, the HELLO **Gödöllő** App,[87] the CityApp-**Kecskemét**,[88] the CityApp-**Tiszaújváros**,[89] and the intelligent budget website in Zugló[90]);
- **Digital municipal operations services** (e.g., the geothermic heating system of **Mályi** village[91] and the introduction of intelligent camera systems and lighting in public spaces in several municipalities);

86 http://okosvaros.lechnerkozpont.hu/hu/peldatar
87 https://hellogodollo.app/
88 https://cityapp.hu/kecskemet
89 https://cityapp.hu/tiszaujvaros
90 https://koltsegvetes.zuglo.hu
91 http://pannergy.com/projektek/#miskolc

- **Smart transportation developments: public transportation** (e.g., the **Budapest** public transportation company's BKK Futár app, which provides live tracking of the vehicles on the company's routes along with their scheduled arrival and departure time and any delays[92]); **community cycling transportation (Győr, Pécs, Budapest, Esztergom-Párkány); smart parking (Szentendre, Kecskemét, Józsefváros, and Kaszásdűlő** have built a sensor- based system to facilitate more convenient and effective parking).
- **Connecting local producers and local consumers** (e.g., Microker,[93] a national search engine for artisanal food; Nekedterem[94] and Youtyúk[95], two national food search engines; and local online customer communities in Debrecen, Miskolc, Kecskemét, and Csömör).

Overall, **common features of most Hungarian smart city developments** are that they **generally emerge as the joint projects of multinational corporations and municipal governments** – occasionally universities – typically with partial or complete funding from the European Union[96].

They also **tend to be pilot projects** and shape up in ways that are typical of such projects, that is **they change while they are underway** (as compared to the spectacular presentations in the initial plans, the substance they achieve tends to narrow considerably during the project implementation). These smart city developments usually **aspire to be complex in their approach**, that is the projects tend to **simultaneously feature infrastructure, hardware, software, applications, and human development alike**.

Conclusion

The basic setup in Hungary to municipal level digital development is not too favorable. **The Hungarian level of digital readiness is below the European average**[97], the scope of responsibilities performed at the level of municipal governments narrowed substantially between 2010 and 2013, due to comprehensive centralization efforts of the government. Furthermore, European and national development policy resources are allocated in line with political preferences: cities under pro-governmental leadership can apply with better chances[98].

92 https://futar.bkk.hu/
93 https://microker.hu
94 https://nekedterem.hu/
95 https://rendeles.youtyuk.hu
96 https://docplayer.hu/18321884-Top-ginop-forrasok-az-okos-varos-projektek-szolgalatataban.html
97 Digital Economy and Society Index (DESI) 2020, https://digital-strategy.ec.europa.eu/en/policies/desi
98 https://hu.euronews.com/2021/09/23/a-bizottsaghoz-fordultak-a-magyar-varosok-koztigazsagtalanul-szetosztott-tamogatasok-miat

Problems of digital readiness, narrowing place of manoeuvring of municipalities and uneven allocation of resources are not the only challenges. Although the majority of bigger Hungarian cities have already recognized the possibilities inherent in the deployment of information and communication technologies (ICT), this insight was not followed by the creation of a unified strategic framework, which is why **the relevant developments tend to be mostly ad hoc and/or determined by funding from the central government or the European Union**.

A standard methodological support framework, a centrally-operated smart city platform service is under elaboration in Hungary, **which can contribute to a more integrated approach in smart city developments in the coming years**.

However, a change in the attitudes of local government leaders is also needed. For the time being, most Hungarian local governments are **not fully aware of the exact state of their municipality's digital infrastructure, nor do they have a clear picture of the range of info-communications services that are available** locally, the services that residents or small and medium-sized enterprises (SMEs) have access to or use, or their digital readiness or consumption patterns.

We are not aware of any Hungarian city in which the efforts to create a "smart city" have extended simultaneously to all areas of municipal operations and where they have been combined to create an interconnected (integrated) system.

The state of affairs.

Digitalization of public services at the local level in the Republic of Moldova

The Republic of Moldova has all the necessary premises, legal and technical elements for a smooth digitalization of public services, including those at the local level. However, the level of adoption and use of digital services remains low and in the case of their adoption at the local level, very limited.

Moldova has one the best connection in terms of the speed of the internet, 76%[99] of the population is using the internet regularly, both via optic fiber and increasingly, using mobile networks offered by telecom companies, 98% of the territory being covered by high-capacity internet networks.

However, in some municipalities and regions which are situated far from the main motorways or at some border areas, the mobile internet network requires serious improvements. According to the statistics, the number of connected phones is over 4 million, which is surpassing the population by almost 1,5 times[100]. The UNDP Digital Readiness Assessment of the Republic of Moldova[101] specify that Moldova has a good progress on the development of digital infrastructure, including the deployment of broadband and last-mile connectivity but the lack of capacities to implement and sustain digital projects is a general concern, including the limited availability of skilled IT professionals.

The Government has made some efforts to provide funding, technical support, but these are perceived as insufficient to successfully integrate some digital projects. The same report specifies that the level of trust, including on privacy regulations, remains low, the same low scores are observed in the spheres of digital skills and social perceptions or culture towards digital transformation.

A systemic problem for the larger implementation of digital services at the local level is a deep digital divide between urban and rural areas in the Republic of Moldova, both at the level of citizens and readiness to accept and use by municipalities employees and public servants.

99 https://datareportal.com/reports/digital-2021-moldova
100 Igor Ciurea, Igor Aramă, The Best Way Bulletin, LID Moldova, 2020
101 https://moldova.un.org/sites/default/files/2021-09/Raport_Digit-RA-MD%2520eng.pdf

Government-wide digital ecosystem

The legal basis for the use of digital services by local authorities is regulated by Law 436-XVI[102] which stipulates the participants on the exchange of data, the Law 142[103] which stipulates the conditions and requirements of the interoperability of the systems and data sharing and by the Government decision 211 which specifies the functionalities of the MConnect Interoperability Platform.

Interoperability and data exchange

Using MConnect, local authorities could access and use for their daily work the data from various data registries, including State Population Registry, Legal Entities Registry, National Health Insurance Company, etc. Despite these opportunities and possibilities, only a limited number of municipalities are actively using the full potential of these instruments, many local authorities, for various reasons, prefer to use slow and bureaucratic paperwork. This state of affairs is happening due to the lack of information campaigns, lack of interconnection between various services and databases, non-user-friendly interfaces, low level of trust in digital solutions, lack of cooperation between institutions, opposition (and sometimes, sabotage) of a number of public servants to accept and use them. Of serious concern is the situation in small rural municipalities, where the level of adoption is rather nonexistent. The situation is a bit better in larger towns which are the regional centers and the most interconnected municipality is the capital city of Chisinau.

Digital identity

Moldova has developed an MPass[104] digital permit system that allows the registration of the users to access the digital services and information systems, authenticate the users and offer the data about them, which are needed for proper legal authorization and management. Currently, MPass has more than 143 000 active users.

Electronic signature and holographic one has the same power in the Republic of Moldova, according to the Law 91[105] but even this aspect is regulated, the level of acceptance of the digitally signed documents by public servants is still very limited, especially in rural areas. Digital divide between urban and rural areas in Moldova is evident

102 http://www.descentralizare.gov.md/doc.php?l=ro&id=654&idc=253
103 https://www.legis.md/cautare/getResults?doc_id=105501&lang=ro
104 https://mpass.gov.md
105 https://documente.net/document/lege-privind-semnatura-electronica.html

There are 3 active modalities of digital authentication available: mobile signature issued by 2 telecom companies (Orange and Moldcell), mobile signature issued by STISC[106], and electronic ID issued by the Agency for Public Services. The newly elected Government announced recently that a new type of digital signature certificate will be developed, using the analog of Estonian Smart-ID[107], based on a smartphone application only, which has the potential to trigger the use of digital signature in Moldova, quickly.

The digital signature certificate is not mandatory in the Republic of Moldova which creates a limited possibility for large implementation of digital services. Many holders of digital certificates are using them only occasionally, being forced to use them by several regulations (public servants, bookkeepers, etc.). Other confusing aspects are the various power or status of the digital signature of various authentication methods, which creates a lack of clarity, limited- term of validity of authentication certificates and credentials, bureaucratic procedures for applying to new certificates or renew existing ones.

MSign[108] is an integrated governmental system that allows the use of digital signature, apply on a digitally signed document, verify the authenticity of a digital signature on a digitally signed document, validate the actions when using various informational systems and integrate all types of digital signature certificates. Currently, monthly, more than 2 million digital signatures are applied, using the MSign system.

MPower[109] registry is another functional system that allows private citizens and legal entities to empower third entities to use around 70 services and documents (life events certificates, information from various registries, licenses, authorizations, etc).

MPay[110] is a governmental universal payment service for public services, offering the possibility to pay almost 800 services of 88 service providers, via 14 intermediary institutions (banks, payment terminals, Moldova national Post operator, etc).

Historic developments of digital services for local authorities. Existing digital solutions for local authorities and the perception of the citizens.

The Government of the Republic of Moldova has managed to digitalize 126 public services out of 580 existing services for citizens and businesses[111], mainly

106 https://stisc.gov.md/ro
107 https://www.egov.md/en/communication/news/digital-opportunities-and-electronic-public- services-presented-diaspora-congress
108 https://msign.gov.md/#/
109 https://www.asp.gov.md/en/mpower
110 https://mpay.gov.md
111 Igor Ciurea, Igor Aramă, The Best Way Bulletin, LID Moldova, 2020

by the e-Governance Agency of the Republic of Moldova (which has the leading role in the development of digital services nationwide), in cooperation with various Ministries and state institutions, of special attention being the Agency for Public Services (ASP). Even if municipalities have the entire mandates and powers to develop their own digital services, just very few of them have the capacities to develop them, mainly capital city of Chișinău and few other large towns.

According to the national survey on the perception, assimilation, and support of the people on e-Governance and modernization of the governmental services[112], held by the e-Governance Agency in 2020, 22,6% of the population would like to obtain the services in a single location and less than 11% online or by phone.

Currently, a total number of 85 public services are in the process of modernization, including the obtaining of the majority of the life events certificates, unemployment support, driving license, registration of legal entities, issuing of the pensions, etc. The most used digital services in 2020 were electronic fiscal services (32,8%), cadastral services (23,2%), judicial certificates (19,3%), and the Agency for Public Services certificates issued via digital channels (19.1%). Almost 50% of the online services were issued by young people (18-29 years) and only 37% of the users were able to access these services by themselves, facts which underline a digital divide on age segments as well. The re-engineering of these services and their wider use are crucial

for the development of new services at the local level as currently, the trust in digital services remains very low.

Among current plans of the Government in this sector are the establishment of Unified Centers of Services (CUPS). CUPS-es are alternative channels of services that are being established currently, where the front -office is assured by a third institution that unifies the issuing of various services, in a single location. Through CUPSes, the citizens would be informed about the identification of a needed service, necessary documents, applications, steps to be implemented. CUPS specialists would assist the citizens when accessing a service or provide the access via CUPS computers, could apply on their behalf if such a request will be made from the customers. Currently, EGovernance Agency is implementing a network of 22 CUPSes in 17 smaller municipalities and 5 consular offices abroad, using 24 services în the pilot program (2021-2022)[113].

The Portal of Public Services, which is a national service platform, represents a interface for accessing digital public services, available on the servicii.gov.

112 https://www.egov.md › en › file › 6480 › download?token=r0lglpa5
113 Data provided by the e-Governance Agency of the Republic of Moldova

md platform, which has more than 500 000 unique users per year. The newly developed version (2.0), has a more user-friendly interface, is adapted to be used in smartphones too, has a more advanced search option, allows a more optimized interaction with the users, including a chat-bot, and is aligned to EU standards of Single Digital Gateways.

Various municipalities implement several local solutions but the number of these solutions is still quite limited, due to lack of human and financial resources, poor coordination between state and local authorities, insufficient cooperation with ICT companies, lack of trust in digital services and poor leadership in this sphere. For example, in some municipalities[114], it is possible to access the payment services via MPay directly from the municipality website (payments for the kindergarten, certificates issued by the Mayoralty, urbanistic certificates, vendor permission, etc). In Cahul town, a platform called Alerte. MD[115] is functional where every citizen could identify a problem to be solved which is automatically sent to the municipality for the analysis. Even this platform is operational, is used by a very small number of people because they do not see how this platform solves their problems. Unfortunately, this platform, which was earlier operational for capital city Chisinau too, was stopped for the same reasons and lack of resources to maintain its functionality.

An important achievement by authorities in 2020 was the launching of the Governmental Citizen Portal (MCabinet)[116] where every citizen could analyze a vast set of information about themselves (13 data sets) using secure authentification tools. Among the information available on the portal are identity documents, real estate, and cars possession, legal entities connected with the user, social and medical insurances, fines, electronic payments, personalized alerts, etc, including past access history of the data.The Government hopes that MCabinet would be a platform which will enhance the use of online services in Moldova and therefore, serve as a catalysator of the use and development of new services, including at local level.

Future perspectives, challenges, and recommendations for the development of digital services for local authorities

2021 was a very important year for the development of digital solutions in the Republic of Moldova as the new Government emphasized the digital transformation of the country as a top priority of the Government[117]. For the first time

114 http://primariacahul.md
115 https://alerte.md
116 https://mcabinet.gov.md/ro
117 https://gov.md/ro/content/iurie-turcanu

in the history of Moldova, a leadership structure which is responsible for the digital transformation was established, led by a specially designated Deputy Prime-Minister for Digitalization which has the coordination role between all Ministries, agencies and specialized state entities.

The whole-of-society approach in digitalization is the top priority for the new Government which means much more coordinated cooperation with the local authorities too. The Government works closely with the Congress of Municipalities of Moldova (CALM)[118] on this new priority and soon, a systemic approach to the development of digital services for the local level called eAPL (eLocal Public Administration) will be launched.

Currently, eAPL is in the conceptualization phase[119], but the vision of the eGovernment Agency regarding the unification, standardization, and digitalization of the public services at the local level includes the development of a software-as-a-service e-APL system that will combine the following aspects:

- eAPL will be a multi-tenant system which means that the same system and solution has the potential to be used by all municipalities willing to join but also its centralized administration and management;
- eAPL will possess a set of standards of processes, user optimization in a digital environment, connected to administrative data sources.
- These processes will be identified and implemented gradually, starting with the most critical needs and used services;
- eAPL will exclude the functionalities of other informational systems. At the same time, they should be interconnected and the possibility to be easily integrated should be assured, for example, notifications regarding the registration of a legal entity, building permits, and authorizations, real estate registry, life events registry, etc.

eAPL will be implemented in few phases, starting with the analysis of the existing processes for private citizens, public entities, and entrepreneurs, including the mapping of the processes and services, development of the AS-IS documents, identification of the shortcomings and challenges of local authorities in using digital solutions and the selection of focus services to be tested as part of eAPL system. Standardization of the services will be developed after this phase (so-called TO BE versions), followed by automatization of the services, development, and implementation of the security policies regarding data use at the local level.

118 https://www.calm.md
119 http://old.calm.md/libview.php?l=ro&idc=66&id=6223&t=/SERVICIUL-PRESA/Comunicate/ Perspectivele-e-guvernarii-locale-din-Republica-Moldova-un-domeniu-de-cooperare-strategica-intre-CALM-i-Agentia-de-Guvernare-Electronica

There are several general recommendations for the future development of digital services for local authorities which should be delivered by both state (e-Governance Agency) and local authorities entities (municipalities and regional level) and representative bodies (CALM):

- the solutions should be developed using a systemic and inclusive approach, after a solid analysis of the realities and needs, together with the representatives of the local authorities of different sizes and geographical locations in Moldova, Congress of the Local Authorities of Moldova (CALM), various types of public servants at the local level, not only top political leadership but also municipality secretaries, cadastral engineers, social workers, etc.;
- the solutions must be simple in use, intuitive, easily accessible, fully interoperable, keeping in mind the existing digital divide, inertia in keeping the services in paper version, and inefficient bureaucratic procedures;
- large and systemic informational campaigns must be organized, both for public servants working in the local authorities and the citizens, as well specific programs for specialized directions and topics, involving local entrepreneurs, educational institutions, non-governmental institutions, libraries, and active citizens, as much as possible, creating the feeling of ownership, explaining the benefits provided by the use of digital services, from various perspectives.
- Identifying the true enablers and promoters of the use of digital services of special attention being the building of the leadership capacities of local mayors, counselors, and public servants for daily use of digital services.
- Building a strong interconnection between local authorities and state institutions responsible for the digitalization of the services and owners of the data registries, to assure a smooth and secure exchange of data, as well the security of accessed data;
- Overall and inclusive activities related to the continuously growing use of digital services, including wider use of digital signature authentication tools, use of existing solutions, etc.

The state of affairs.

Digitalization of public services at the local level in Finland

Finland – a top performer on digital transformation

"Finnish society is currently undergoing a transition that includes big structural reforms. One framework for the changes is provided by digitalization. It challenges us to question the existing methods and practices and to make them more effective and flexible."

Ministry of Finance

Finland, among the other Nordic countries, are seen as digital front-runners in Europe – even globally[120]. The European Commission's Digital Economy and Society Index (DESI), which summarizes indicators on Europe's digital performance and tracks the progress of EU countries, puts Finland at the top.

Finland is a leading country when it comes to 5G readiness and when it comes to the human capital dimension of the index covering "internet user skills" and "advanced skills and development". Finland is a top performer on digital transformation of businesses, but most importantly, Finland is a top performer on people using digital public services.

According to DESI, Finland ranks very high on both the demand and supply side of digital public services, as well as open data. More than 90% of internet users who need to submit filled forms to the public administration use government portals. While Finland is not at the top when it comes to which extent dealing with the public administration can be done completely online, Finland belongs to the top 14 countries on e-government users[121].

How come Finland is a global front-runner in digitalization? A big reason is the success story of Nokia – who already in the 1990s made use of public decision makers encouragement for a digital transformation. While Nokia is no longer the world's leading mobile phone company it is one of the largest providers of 5G equipment and services at this moment.[122]

Today, digitalization is integrated in Finnish society. The concept plays a big role in the Government Programme as well as for the private sector. One could say the prerequisites for successful digitalization of public services are great.

120 Nordregio (2019).
121 European Commission (2021).
122 Finland Toolbox (2021).

Even according to Finnish law –the Act on the Provision of Digital Services – authorities are required to give everyone the possibility to send messages and documents associated with their cases digitally[123].

International policy background

The digital transformation of LPAs in Finland is encouraged and supported not only nationally, but also on the European and Nordic level. The European

Commission's Policy Programme A Path to the Digital Decade[124] of September 2021 aims to set up a governance framework to help achieve the targets laid out in the 2030 Digital Compass of March 2021. The 2030 Digital Compass outlined the European way for the digitalized economy and society, and proposed a set of concrete targets in e.g., the area of public services.

By 2030, all key public services should be available online; all citizens will have access to their e-medical records; and 80% citizens should use an eID solution. A Path to the Digital Decade supports this target by reducing barriers to public services and ensuring they are accessible across borders. It also supports Smart Cities across Europe – cities using technology to be more efficient.[125] The Digital Europe Programme is a new EU funding programme supporting and accelerating projects contributing to the digital transformation in the EU.[126]

Finland, being part of the Nordic countries, is naturally very much involved in digitalization of the public sector on a Nordic level. The vision of the Nordic Council of Ministers is that, together, the Nordic and Baltic countries will be the most integrated region in the world – and this is a guiding principle for Nordic co-operation on digitalisation.[127] The Nordic Council of Ministers' action plan Vision 2030, that runs from 2021 to 2024, involves a focus area on an inclusive and green digital transition.[128]

The Nordic Council of Ministers for Digitalisation (MR-DIGITAL) has several objectives, one being the development of a cohesive digital infrastructure for the region's citizens, businesses, and administrations. Two priority areas are the creation of a digital single market and the promotion of innovative digital solutions.[129]

123 Lag om tillhandahållande av digitala tjänster (306/2019).
124 European Commission (2021b).
125 European Commission (2021b).
126 European Commission (2021c).
127 Nordic Council of Ministers.
128 Nordic Council of Ministers (b).
129 Nordic Council of Ministers.

National policy background

The concept of digitalization is integrated in the Finnish Government Programme 2019-2023. The Programme includes the objective to develop and introduce new solutions enabled by digitalization and technological advances to increase capabilities of the public sector and promote cooperation between the public and private sectors.[130]

Administration procedures in municipalities vary and are sometimes incoherent and therefore, the Programme for the Promotion of Digitalization ("Digitalisation Programme") was created in February 2020. The Digitalisation Programme has been put together to implement the objective stated in the Government Programme. The Programme supports and encourages public authorities to make their services available digitally by 2023.[131]

The Programme has four focus areas: to apply and develop necessary legislation, to advance digital public services, to advance and establish digital support, and to make digital-only business services available. This also includes public administration on a local level. The progress of these focus areas will be assessed using a set of indicators and an up-to-date picture of the situation. The responsible ministry is the Ministry of Finance.[132]

The National Artificial Intelligence Programme AuroraAI is based on the objective from the Government Programme of building a dynamic and thriving Finland. The AuroraAI programme was launched in 2020 and will conclude in 2022. The main outputs of the Programme are to create a network available for citizens and organizations, to develop an operating model that integrates lessons learned, tools and structures, to create a frame of reference for what should be taken into account in the digital transformation, and to produce a new skills and competence development program. All stakeholders, including public ones, are openly invited to join the program.[133]

The digital identity development project develops electronic identification for Finnish citizens and anyone living in Finland, and to promote the development of functional solutions for identification. The project for developing digital identity is taking place between October 2020 and June 2023. An objective of the project is to enable electronic identification in public services for all who need it, including for work duties. This project is in accordance with the EU regulation on electronic identification.[134]

130 Finnish Government Programme.
131 Ministry of Finance (2021).
132 Ministry of Finance (2021).
133 Ministry of Finance (b).
134 Ministry of Finance (c).

State of the municipal digital services

The Ministry of Finance steers the development of local government's activities and duties. Local government's statutory duties cover the following:

- education and day care services
- cultural, youth and library services
- urban planning and land use
- water and waste management
- environmental services
- health and social services (will be transferred to the counties in 2022 as part of the health and social services reform)
- fire and rescue services (will be transferred to the counties in 2022 as part of the rescue services reform)[135]

Besides the statutory duties, local governments may organize other services, such as services concerning economy, employment or housing.[136] In an international context, municipalities in Finland have a strong self-governance. The Finnish Government can't force municipalities to e.g., use the same programs as other municipalities for their digital services. This results in quite a lot of differences in the digital services supplied in Finnish municipalities.

Digitalization in municipalities is not only seen as the act of digitizing services, but a way to truly change the way the municipality operates. With different demands in different municipalities the results can vary.[137]

Part of the Finnish Digitalisation Programme is to map municipalities' digital public services to produce necessary information for developing digital public services further. The first mapping[138] was done in spring 2020 and the next one is taking place in autumn 2021. The mapping looked at all responsibilities in municipalities, besides social- and health services, as well as rescue services, as these are moving from the responsibility of the municipalities to counties in 2022. The first mapping concluded in the following three conclusions:

- The bigger the municipality, the broader the digital service supply and the more advanced services
- The more municipalities using the same digital service, the more advanced the service is
- The less digital services the service provider supplies, the more advanced the services are

135 Ministry of Finance (d).
136 Ministry of Finance (d).
137 Suvi Savolainen, Ministerial Adviser, Ministry of Finance. Interviewed on October 4th 2021.
138 Ministry of Finance. 2020.

The mapping also showed that the dispersion between the number of digital services and how advanced the services are decreased when comparing bigger municipalities. Therefore, the following complementary conclusion can be made:

- From the perspective of the supply of digital services and their advancement, municipalities are more homogenous the bigger the municipalities are[139]

When looking specifically at bigger municipalities, 70% of their public services are available digitally. Some sectors are more advanced than others – work and entrepreneurship being clearly more restricted than others.[140]

The majority of public services are made available digitally by using programs produced by the private sector. This increases the municipalities' dependency on solutions offered by the private sector, but in most cases, developing a program in-house is too expensive for any municipality. Relying on a third-party results in some services being more developed than others and having to wait for services to be updated for them to meet the customer demands.[141]

Cooperation between the state and the municipalities – the Ministry of Finance

The Ministry of Finance ensures that municipal autonomy is taken into account when preparing national legislation that concerns municipalities. A negotiation procedure between the state and the municipalities is implemented in the Local Government Finance Programme procedure and in processing issues that concern municipalities in the advisory council on local government finances and administration.[142]

The Public Sector ICT Department, under the Ministry of Finance, provides preconditions for the digitalization of the public sector. This includes digitalizing public sector services, promoting interoperability across administration and enabling the security of authorities' activities. The Public Sector ICT is responsible for the overall development of the digital services of public administration and the integration of joint development projects.[143]

139 Ministry of Finance. 2020.
140 North Patrol. 2021.
141 North Patrol. 2021.
142 Ministry of Finance (e).
143 Ministry of Finance (f).

Supporting citizens in their interaction with public administration – The Digital and Population Data Services Agency

The Digital and Population Data Services Agency (the Finnish Digital Agency) promotes the digitalization of society, secures the availability of data, and provides services for the life events of its customers. The Agency is a result of the merging of the Population Register Centre, the Local Register Offices and the Steering and Development Unit for the Local Register Offices, which operates at the Regional State Administrative Agency of Eastern Finland, in 2020. [144]

The Digital Agency has a Suomidigi-service that brings together Finland's digital service developers and maintains an interoperability platform that consists of the glossaries, code sets and data models free of charge both for the public and private sector. Furthermore, the Digital Agency provides tools that promote digitalisation and coordinates the national digital support network.[145]

Advocating for municipalities - the Association of Finnish Local and Regional Authorities

The Association of Finnish Local and Regional Authorities (AFLRA) describes themselves as the influential and solution-oriented partner for municipalities in the promotion of digitalisation. AFLRA works through advocating, participating in the development and execution of digital solutions, and by giving LPAs and collaborators new perspectives on digitalisation. AFLRA produced support material for municipalities, such as instruction and models.[146]

Best practices

In this section, best practices and successful project will serve as examples of profitable ways of integrating digital solutions on a local level.

DigiOne – advancing educational services in Finland

DigiOne is building an open ecosystem where all actors working in education can join together to build a national service platform for education. This project, running from 2019 to 2023, is a cooperation agreement between the cities of Espoo, Oulu, Tampere, Turku and Vantaa, as well as Kuntien Tiera inc. The cities of Lahti and Jyväskylä joined the project in March 2021 – and, together, these seven cities represent 25% of the Finnish population. Kuntien Tiera Inc. offers ICT services and digital and ICT solutions, and develops digital solutions for municipalities, cities and counties, and when the project ends in 2023, Kun-

144 The Digital and Population Data Services Agency.
145 The Digital and Population Data Services Agency.
146 The Association of Finnish Local and Regional Authorities. 2021.

tien Tiera Inc.will have the main responsibility of the project. The goal is that by 2028, more than 70 municipalities in Finland will use DigiOne.[147]

The objectives of DigiOne are to create a national digital service platform and education ecosystem, contribute to the change of the pedagogical operating culture and management in accordance with the curricula, create better conditions at the national level for the learning and well-being, create easy- to-use and easy-to-deploy services, create synergy benefits for its owners, and to ensure non-commercial ownership of the service platform and the ecosystem.[148]

While DigiOne takes an individualistic approach as the platform and ecosystem is developed from the learner's perspective, it could be argued that DigiOne benefits LPAs as well. Education and day care services are statutory duties for local governments – and in the long run DigiOne could reduce inequalities in this sector between municipalities since the platform and ecosystem is open for all actors to join. Moreover, DigiOne is a great example of cooperation between municipalities as well as between municipalities and experts in digitalisation and ICT[149].

HIPPA – Wellbeing and better service housing through digitalisation

In the Six City Strategy (6Aika), Helsinki, Espoo, Vantaa, Tampere, Turku and Oulu – the six largest cities in Finland – tackle challenges of urbanisation together and develop better services. The strategy was founded in 2006 and is built on smart city projects. These are projects on e.g., smart mobility, learning, health, well-being, circular economy and energy efficiency.[150] The strategy has proven useful for companies to collaborate with cities, and in the long term to scale up and collaborate with many cities. Furthermore, the strategy has been beneficial for companies in understanding the needs of cities and different sectors.[151]

The HIPPA project, under the Six City Strategy, developed smart housing products and services in collaboration with companies in Helsinki, Tampere and Oulu. The aim was to facilitate the user-driven product and service development of companies in the 6Aika cities to promote smart service housing and living at home. The project ran from August 2018 to March 2021. The project created the TUTTUnet testing and support network to

147 DigiOne.
148 DigiOne.
149 Digione. 2021.
150 6Aika.
151 6Aika. 2020..

facilitate development work in the well-being and health sector – and while the HIPPA project has come to an end the TUTTUnet continues running. The HIPPA project has e.g. involved the development of safety bracelets, positioned serviced and application for communication between residents, their family members and staff, and tested a virtual map service for making exercise more appealing.[152]

The HIPPA project serves as an exemplar of cooperation between several sectors, such as social- and health services, ICT, real estate and building services, and business administration[153]. The TUTTUnet website demonstrates services offered in Helsinki, Tampere and Oulu. At the same time, the website invites citizens to take part in developing the services further by submitting

a challenge or problem that could be solved by developing new services or products. It is also possible to join a test group to evaluate services or products. If one has an idea or developed product that fits with TUTTUnets other services and products, TUTTUnet offers co-development and testing processes.[154] While the HIPPA project and TUTTUnet don't concentrate on cooperation between municipalities or scaling up, they are unquestionably utilising digitalisation as a tool to better services and to be more inclusive.

The smartest village in Finland – digitalisation in rural Finland

In 2019, the village Vuolijoki in the Kainuu region won Finland's smartest village competition. The village was chosen by a panel of experts. The competition aimed to help and encourage villages to be "smart", through digitalization for example, during the two years the competition ran. The competing villages were offered guidance, examples and peer support.[155] A smart village does not differ much from a smart city – it seeks smart solutions for providing services, keeping in mind the different challenges and possibilities villages face. Vuolijoki collaborates with other villages and broadens its network both in Finland and in Europe. The village with its 2100 inhabitants impressed the panel of experts with its strong community, the advancement it made during the two years the competition ran, and the use of digital tools in everyday life.[156]

152 6Aika. 2021.
153 6Aika. 2021b.
154 TUTTUnet.
155 Rural.fi. 2021.
156 Rural.fi. 2020

Recommendations

Finland ranks number one in the DESI 2020. The digital transformation is integrated in the work Finnish authorities do on an international, national, regional and local level. Finland showcases both smart cities and smart villages, making use of digital tools and services. Digitalisation is a horizontal priority on a national level, but digitalization on a local level is a way of realizing the municipality's duties.

This results in LPAs being on different levels on their path on digitalization, as well as different programs being used depending on the city, municipality or village. This is evident also in the mapping of municipalities digital services done for the National Digital Programme. This section presents three main recommendations on the digital transformation in LPAs from a Finnish context.

1. Digitalization presents an opportunity for collaboration between LPAs. Besides avoiding duplication of effort, it could also decrease LPAs relying on third party solutions. Collaborating when it comes to programs used or applying for funding could also be less expensive for municipalities.

In order for LPAs to collaborate, platforms for this purpose need to be established. In Finland, LPAs have collaborated thanks to co-funding from e.g., the European Commission (the HIPPA project and TUTTUnet) or Business Finland (the DigiOne project). Also, platforms are highly encouraged by stakeholders, such as the Ministry of Finance, the Finnish Digital Agency or AFLRA. Collaboration requires political and financial support, as well as active municipalities that believe in investing in digital transformation.

2. A successful digital transformation requires enough digital skills, not only by the producer of services, but also by the user of services. Digital competence is integrated in the national curricula, many companies offer their employers the possibility to take part in courses to advance their digital skills, and libraries across Finland often offers support for using digital services.[157]

To advance a country's digital skills, the importance of investing in digital skills should be communicated from a top-down approach. Integrating digital skills in the national curricula delivers a strong message of the needed skills of future employees. However, the digital transformation is proceeding rapidly and companies, organizations and other employers must take their responsibility and help current employees advance their skills – to the extent the employer is able to.

157 The Association of Finnish Local and Regional Authorities. 2021b.

3. A successful digital transformation is based on to what extent the municipality can anticipate the needs of the citizens, so the development of digital services should be done from the perspective of the customers – and this means to include customers already in the planning stage. Furthermore, services should be developed according to the duties of the municipalities and connected to any policy programs or objectives of the municipality in question.[158]

The Finnish context might not be applicable in other countries, as municipalities' responsibilities and possibilities differ. The LPA needs to view their contribution to digitalization from their own context – what services are statutory and what legislations, programs or objectives does the LPA need to follow?

When the LPA's possible contribution to digitalization is defined, the LPA need to decide on how to include its citizens – their customers. Again, the Finnish context might not be applicable. The LPA might decide on inclusion through websites, testing groups or even physical citizens' meetings.

158 Suvi Savolainen, Ministerial Adviser, Ministry of Finance. Interviewed on October 4th 2021.

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Conclusions

Through the analysis of 6 countries, we see that there are distinct variations in the historical and cultural context in which local municipalities have developed and to which level the digitalization of public services has matured. And while these countries have their unique trajectories, there are commonalities among the challenges and bottlenecks they face on the path to digitalization.

These commonalities revolve around the distribution of roles between the levels of governance, legal frameworks, challenges related to funding, size, capacity to execute.

Levels of governance

Depending on which school of thought one belongs to, it can be argued that

1. digitalization of services is simpler to execute with a strong central government because of the economies of scale;

2 or digitalization of services is simpler to execute at the closest level of governance to the citizen because of the ability to personalize services.

From the insights gathered across 6 countries, we see that the type of government does not necessarily predict success in digitalization of public services. We can see that from the example of Estonia and Hungary, where both countries have relatively strong central governments and thin levels of local governance, however the maturity of digitalization of services on municipal level differs greatly. With Germany being a federal country, we see even more challenges of digitalizing public services in municipalities, while Finland also having a regional level has shown great progress.

Digitalization of public services on the local level has depended on having a clear understanding of the mandate different levels of governance have and the ability of the local level to adhere to the national legal frameworks while leveraging relationships with private sector counterparts for developing solutions.

Legal frameworks

It's evident that public sector entities can operate efficiently within an environment with clear legal frameworks. Public sector is driven and works based on mandate which is given through legislation and policy.

With that in mind, some countries have been able to put forward and implement nation-wide legal frameworks that support the adoption of digital services on both the local and national level. From the countries observed, we see that both Finland and Estonia have been able to enable the digitalization

of services by introducing legislation around digital identity, data exchange between government counterparts, rights for access to data by citizens etc.

While the legislative aspects are covered by the central level of governance, their impact and importance transcend into the local level as well. As an example, both countries have legal frameworks for interoperability and data exchange which is used across public sector. Therefore, the local level does not need to reinvent the wheel when it comes to these (critical) activities and can relay their focus on the local characteristics.

Funding, size and capacity to execute

Even though the local public authorities in these 6 countries have a different scope in terms of the services they're mandated to provide, it's evident that smaller municipalities have more challenges in securing adequate funding and the necessary staffing for deploying and operating digital solutions and services.

It should be noted that while there might be less users of a service in a smaller municipality, the complexity to execute a service digitally does not necessarily differ between municipalities. That is to say, if we are digitalizing the issuance of a license, then the business process and the related complexity is similar across LPAs regardless of their size.

Several countries in this paper have indicated that the emergence of shared services between LPAs and the onboarding of private sector service providers has enabled to overcome these challenges, especially for smaller municipalities.

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