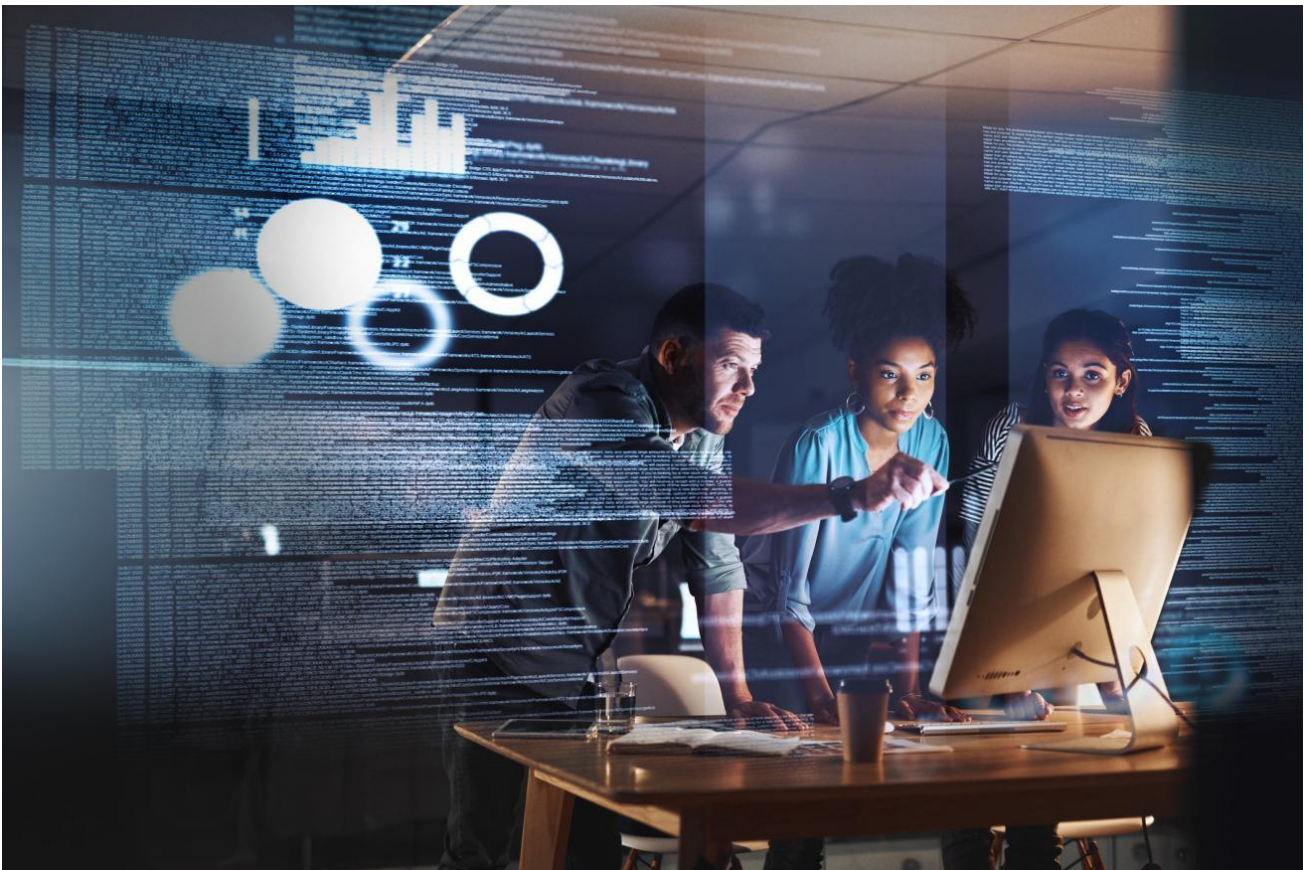




Compendium on
**Human Centric Approach to
Digital Transformation**



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Introduction

This Compendium summarizes key learnings from a series of workshops titled “Spotlight Series on Human-Centric Digital Transformation”. The initiative is based on the ITU Regional Development Forum for Europe (RDF-EUR) submission titled [A human-centric approach to digital transformation](#). The RDF-EUR served as a platform for dialogue and exchange of views between ITU officials, decision-makers of ITU Member States and Sector Members, and other stakeholders across the Europe region. The Spotlight Series initiative has been rolled out by the ITU Office for Europe together with the Republic of Poland and the Czech Republic, in cooperation with all countries of the Europe Region. The sessions were organized under the ITU Regional Initiative for Europe 2 “Digital transformation for resilience”, as well as in line with Regional Initiatives 3 “Digital skills and Inclusion” and 4 “Trust and security in the use of ICTs”.

The objective of this initiative has been to **enhance the understanding of human-by-design digital features**. This was achieved by showcasing concrete, hands-on examples of human-centric digital transformation. These cases take into consideration how technology impacts people's lives and aligns digital innovations with societal values and norms for example in the areas of government services, education, or health.

It is important to note that this Compendium is a first step in this initiative, aiming to provide the reader with an early overview of what human-centric digital transformation might mean. The reference is initiatives of the Europe region, i.e., good practices that aim to guide interested stakeholders in Europe - but also beyond. An increasing number of stakeholders are asking the question: How to address human-centric components of digital services and roll out good practices? We hope that this Compendium will help nurture more exchange on this topic and inspire stakeholders to undertake more cohesive approaches by learning from each other. The Compendium summarizes our current understanding based on the Europe region and shall be used as a starting point for future discussions.

We would like to thank Albania, Czech Republic, Estonia, France, Georgia, Hungary, Latvia, Lithuania, Moldova, Republic of Poland (the), Serbia, Slovenia, Spain and Ukraine for their contributions.

Defining Human-Centric Digital Transformation

Human-centric digital transformation is an emerging term, but the importance of societal considerations in technological development is not new. Similar notions have been explored in different contexts, such as Responsible Research and Innovation (RRI), a framework in the European Union¹, or Digital Social Innovation (DSI), for collaborative types of innovations to address SDGs². The ITU has published a toolkit on Digital Transformation for People-Oriented Cities and Communities³, highlighting the urgency of promoting sustainable, inclusive, resilient and improved quality of life to be considered when planning the digital transformation of cities. Furthermore, GovStack was initiated to help governments build sustainable digital infrastructure and human-centered digital services⁴.

In this Compendium we use the input of technical experts and the initiatives presented in the Spotlight Series as a reference. The original invitation defined human-by-design digital features as approaches ensuring accessibility, promoting inclusivity, protecting privacy, and fostering a sense of community and collaboration. Once the cases were presented in the Spotlight Series, it became clear that the technical experts' considerations to ensure that digital services are putting humans at their core – or what constitutes as human-centric digital transformation – reach even further and can be summarized as:

Human-centric digital transformation is the process in which either existing governmental services are digitized in a human-by-design manner, or novel solutions are developed in private-public partnerships to bring about positive socio-economic development and “alleviate pain points” by optimizing processes.

The term has two intertwined components. First, the technical side, which means that the digital tools and platforms developed are comprehensive, interoperable, privacy-aware, and open source. Second, the societal side, which means that the tools are human-by-design: developed in a participatory and user-centric manner, designed to be accessible (including being administratively simplified), and trust is created through transparency.

In the process of moving towards human-centric digital transformation, governments recognize the importance of an agile, flexible and responsive approach to the needs of all possible users.

¹ Stilgoe, J., Owen, R., and Macnaghten, P. (2013): Developing a Framework for Responsible Innovation. *Research Policy* 42 (9): 1568–80. <https://doi.org/10.1016/j.respol.2013.05.008>

² Dionisio, M., de Souza Junior, S.J., Paula, F. (2023): The role of digital social innovations to address SDGs: A systematic review. *Environment, Development and Sustainability*. Springer. <https://doi.org/10.1007/s10668-023-03038-x>

³ <https://toolkit-dt4c.itu.int>

⁴ <https://www.govstack.global/>

This detailed definition was derived from the perspectives shared in the Spotlight Sessions. In the next section, we summarize the cases generously shared by technical experts. Ms. Blanca González in her presentation about the digital priorities of the Spanish Presidency of the European Union highlighted the key goal of this initiative:

“In spaces like this, we have the opportunity to share ideas and move forward together towards a Europe ready to lead the digital revolution”

In this spirit, the good practices, key take-aways and guidelines that follow were collected to share knowledge and inspire the implementation of similar regional initiatives in Europe and beyond.

Methodology

The ITU Office for Europe organized 3 online workshops between October and November 2023, inviting countries to nominate and present case studies of operationalized human-by-design digital services initiatives, in particular in, but not limited to, the area of government services, education, or health. The presentations were a combination of ICT Stakeholders’ and Governments’ perspectives on challenges, enablers, relevant regulatory practices and recommendations.

The workshops strived to achieve geographic balance within the Europe Region, sought engagement of all countries of the Europe Region and remained open to stakeholders beyond Europe, who were invited to ask questions through a Q&A function.

The AI-generated transcriptions of the recordings were subsequently compared with the audio content and key learnings were extracted for the cases below. A systematic analysis of all cases was used to generate two important outputs of the initiative: the Recommendations for and Principles of Human-Centric Digital Transformation.

As such succinct summaries can become reductive, the complete recordings of individual presentations detailing each good practice can be individually accessed online. Respective links to those recordings have been added to the case descriptions below.

Digital Priorities of the EU Spanish Presidency

The tone of the Spotlight Series was set with a summary of Spain's digital transformation priorities during its presidency of the European Union. Spain's commitment to a digital future that defends rights and fosters innovation was highlighted, and the following key priorities relevant for this human-centric digital transformation were presented:

- **Artificial Intelligence Regulation:** the aim of this bill is not to undermine innovation, but to protect the fundamental rights of individuals, bring productivity gains to the EU and for it to become the world standard, similar to GDPR. The regulation is accompanied with tools that are implemented by actors in the first European sandbox on AI regulation⁵.
- **Reinforcement of European Cyber Resilience:** in addition to the Cyber Solidarity Act and the Revision of the Cybersecurity Act, the Cyber Resilience Act ensures that products on the market have fewer vulnerabilities and users are cybersecurity aware.
- **Interoperable Europe Act:** negotiations are concluded to promote cross-border interoperability of trans-European digital public services and supporting semantic interoperability initiatives from the European Commission.
- **Digital Rights and Principles:** accelerating the EU's human-centric and rights-oriented digital transformation, including ethical and inclusive digitalization. The Charter of Digital Rights, published in 2021, has been a guiding document and empowering tool for individuals and inspired the European Declaration of Digital Rights and Principles.
- **Digital Decade:** by 2030, the number of unicorns is to be doubled and it is to be ensured that the best technology entrepreneurship ideas and projects stay in Europe.
- **Interregional Cooperation:** connectivity is crucial for human-centric digital transformation. However, 2,6 billion people remain unconnected. The Green and Digital Fund (with an initial funding of 300 million USD) ensures meaningful connectivity and knowledge transfer for Latin-American countries.

Presenter: Ms. Blanca González, Head of Unit, Cabinet of the Secretary of State for Telecommunications and Digital Infrastructures, Ministry of Economic Affairs and Digital Transformation, Spain.

Video:

⁵ The EU Artificial Intelligence Act was accepted by the European Parliament on 9th December 2023 <https://www.europarl.europa.eu/news/en/press-room/20231206IPR15699/artificial-intelligence-act-deal-on-comprehensive-rules-for-trustworthy-ai>

Aireen, Czech Republic

Aireen is a deep-tech startup from Czech Republic, which leverages Artificial Intelligence (AI) for healthcare screening practices. The company focuses on the needs of clinical users, e.g. minimizing additional workload to health professionals. Easy to use

“AI has a significant potential to re-humanize healthcare by offloading routine and repetitive tasks and allow for autonomous screening instead, leading to more and longer face-to-face interactions between patients and medical doctors.”

diagnostic tools are developed and deployed for key chronic

diseases, such as diabetic retinopathy. Current systemic issues include a lack of ophthalmologists, the unpleasantness of the procedure, with only 30-40% of patients attending the check-ups. With the help of AI, images can be taken anywhere, allowing for image recognition to be used, and addressing the fragmented nature of healthcare by allowing e.g. nurses in diabetology or a GP's office to conduct the screening.

Human-centered aspects:

- **Design for all users:** The platform takes both the patients' and doctors' perspective and needs into account. A simple and quick process allows for any healthcare provider to conduct the screening, saving time and a painful intervention.
- **Use case first:** The key learning regarding the use of AI in a human-centric way is that the user and the use case have to be defined at the beginning of the development process to ensure the solution adds value: in this use case, an autonomous screening tool is used by a non-specialized healthcare worker, and the tool was tested as such.
- **Safety:** Finally, the platform needs to guarantee that no false negatives are produced, only false positives, which can be verified by the doctor.

Challenges:

- **Testing and certification:** From the startup perspective, the resistance of the healthcare sector is challenging for innovative processes, as testing and certification take a long time, especially when new methods are developed that alter old workflows. Development is also slowed down by the EU's new regulatory processes for medical devices, as there is a lack of private companies that can certify devices and there is significant time and cost associated with the process.

- **Investment:** Investors do typically not give years to startups to start selling functional products, but want to see results faster. EU funding has been useful to bridge this period.
- **Data availability:** The EU is falling behind in the availability of data, and Aireen had to purchase a large data set covering diverse profiles for training the AI from USA.

Recommendations:

- **Simplicity:** The solution has to fit into the existing workflow. User-centric design can create the basis for the simplicity of usage, allowing usage without understanding the whole procedure.
- **Timesaving:** Time can be saved both on the healthcare providers' and the patients' side. The time needed from the patient's is reduced from hours to 4-5 minutes, and can be combined with a regular visit. Work is offloaded, and the capacity of specialized doctors is can be focused on tasks that cannot be automated.
- **Use case:** Finding the right use case is crucial, as if this step is not managed well, the tool is not going to be adding real value.

Presenter: Mr. Matej Adam, CEO, Aireen

Video:

Santé Psy Étudiant, France

Santé Psy Étudiant (student mental health) is a French state start-up, which stems from the digital services incubator of the French Ministry of Higher Education and Research (<https://beta.gouv.fr>). The team members' skills include IT development, business development,

“Our multidisciplinary project team is set up as a start-up, however, it also includes an “intrapreneur” from the ministry, which helps reduce the time needed for bureaucratic approval procedures.”

communication, user experience, design and an “intrapreneur” from the Ministry. It grew out of the need to urgently address mental health issues of students during the pandemic, when therapy was only possible online. The solution allows students to get 8 sessions with a psychologist free of charge, and payments are handled in an anonymous manner by their university.

Human-centered aspects:

- **Responsive team:** The project is built by an agile and multidisciplinary team that has the needs of the users in focus and can react quickly to those needs: both on the students' and the psychologists' side.
- **Design for all users:** The platform is built on human-centric analysis and is growing in an agile manner, reacting to the needs of all of its users: students, psychologists and university admins.
- **Human-centric design:** The project uses various human-centric design approaches to combine the **privacy** and confidentiality of health data with UX design e.g. to create **simple** invoicing interfaces that reduce the administrative time for its users.

Challenges:

- **Inflexibility of procedures:** Existing bureaucratic procedures hinder innovation, as public budget management, the use of private data, and traditional signature processes are rarely flexible enough to allow for novel design and IT development to happen without lengthy approval processes.
- **Reducing bureaucratic complexity:** Reducing the bureaucratic complexity was necessary to reduce the time spent with billing. Other processes and privacy measures needed to be developed to keep students' sensitive data anonymized.
- **Access to users:** Direct access to and early involvement of “real users” was difficult, as functionalities had to be validated in the state start-up context before user testing took place.

Recommendations:

- **Private-public collaboration:** The multidisciplinary project team is set up as a start-up, however, it also includes an “intrapreneur” from the ministry, which helps reduce the time needed for bureaucratic approval procedures.
- **Agility:** The small size of the team proved to be an advantage, as new functionalities can be developed and validated quickly.
- **Privacy:** In terms of privacy, considerations had to be made at the design level. This means that the API had to allow for no registration to be required to use the platform, to balance avoiding identification, but allow for medical-follow up e.g. in the case of prescriptions.
- **Simplification through digitalization:** implementing digital signatures has significantly reduced time and complexity in administration.

Presenter: Lorraine Tosi, PhD, UX Designer at Santé Psy Etudiant, Incubateur de Services Numériques (DINUM), France

Video:

Kidea, Hungary

Kidea is a childcare app that allows educators to share photos, information and stories of children in a secure, easy and coherent way. Parents desire to be informed about their children's development, but without designated and safe platforms,

“National or regional policies could create consistency and the digital safety of children could be protected by implementing social media policies on the governmental level that align with legal requirements and data protection regulations. Expectations and practices across different schools and kindergartens could become more consistent.”

educators have been sharing information on social media. This crosses boundaries of privacy and security, as it exposes children to risks in the digital space. Ethical questions are raised in terms of children's digital footprint or excluding them from activities if their parents don't consent. Kidea works in a GDPR-compliant manner, prioritizing user control and data privacy with the content being inaccessible to third parties, and in an intuitive and structured way. Furthermore, based on the DigiMini research conducted by KIFÜ, a diagnostical tool was developed to define the digital literacy level of institutions, identified interventions updating the childcare education curriculum and sharing good practices such as kidea.

Human-centered aspects: The development of the app started with focus groups of educators under the guidance of leading industry bodies. 260 parents were also surveyed.

- **Simplicity:** Instead of developing an excess of features, the platform is kept simple to not overwhelm the users with features, but focus only on core needs so users feel secure and safe.
- **Privacy:** To be provided both on the educators' and the children's side. Parents have full control over the data, which is not sold to third parties, and if they request deletion, the content is completely deleted unlike on other platforms. The privacy of the educators is also taken into account, as the app is designed to uphold their privacy e.g. by separating the professional and private life by only allowing messaging during working hours.

Challenges:

- **Business model:** The company was planned to be non-profit, however, due to the high expenses, it now operates as B2B to avoid having to commercialize private data.
- **Access to data:** An analysis of 42 childcare apps showed that access to location or camera is often asked for third party libraries, which can be potentially dangerous, whereas kidea only

asks for permission for functionalities directly related to its core functions with the explicit consent of the guardian.

- **Awareness raising:** It was necessary to educate all users about these steps and their role in GDPR compliance.

Recommendations:

- **Education of the sector:** By giving lectures, publishing papers and a kindergarten privacy brochure for institutions to understand data protection as an ongoing commitment, educators are more informed and transformation is more impactful.
- **Privacy of all users:** The privacy of all users involved – educators, parents, children – can be respected with the right design approach.

Presenters: Ms. Zsuzsa Vörös, Co-Founder & CEO, kidea and Ms. Borbála Timár, KIFÜ - Hungarian Governmental Agency for IT Development

Video:

e-Albania: Digitalization of Public Services, Albania

In Albania, more than 1200 public services are provided online. This is due to a gradual process that has been taking place since 2013. This step-by-step conceptualization and implementation has allowed for all services to be aligned. The



“Automatization can help reduce very important elements which represent our day-to-day richness: Costs, obviously, because we have to work for any money that we are paying out of our pocket for any public services. Time, which is the most precious that a human can have ever in life, so we worked very seriously to target that. And reducing the quantity of documents the citizen needs to provide.”



novel, interoperable e-Albania platform allows

for more than 60% of electronic services of different public agencies to exchange information in real time. The case presented here is the user-centric approach to digitalizing and automating governmental services related to transportation. Data about the benefits is collected from more than 3 million points in one year. Thus far, the transparency and quality of service provision, avoidance of face-to-face contact contributing to combatting corruption, reducing the cost of receiving services, and simplification have been major achievements.

Human-centered aspects:

- **Simplicity:** The human-centered digital transformation process has been a chance to redesign services which were seen as complex by the citizens. Through this simplification, a re-engineering of services took place in the governmental and public services system, including automation of bureaucratic steps where human interaction used to be necessary.
- **Reduction of time:** By re-engineering existing services, e.g. the time to become the official owner of a car has been reduced to only 20 minutes, contributing to citizen satisfaction.
- **Reduction of cost:** In the provision of services from the citizens, costs were also reduced by approximately 30% as steps like inspection stamps were eliminated.

Challenges

- **Complexity of existing systems:** Rethinking and redesigning the complete system of public services has been a lengthy and complex process.
- **Interoperability:** In the digitalization process, it also had to be ensured that different agencies can exchange information in real time, and for this, an interoperable platform was needed.

With the development of the platform, digitalization, automation, and a large number of services have been made interoperable and shareable between public agencies.

Recommendations:

- **Transformative, comprehensive program:** A holistic program is needed, and interoperability is crucial. For this, a complete legal framework is helpful that allows for a national digitalization strategy for development and integration of public services online.
- **Value proposition:** Automatization and digitalization need to be seen as an instrument to bring value to the resources that the people have, to make it tangible and valuable for them.
- **Strive for exchange of information in technology and humans:** The centralized e-Albania platform invites all sectors in an interoperable way; however, it was also key that the minds and capabilities of humans are brought together for a common approach and exchange of best practices, in an agile manner.

Presenter: H.E. Enkelejda Muçaj, Deputy Minister, Ministry of Infrastructure and Energy, Albania

Video:

Digital Slovenia 2030 and Digital Heroes, Slovenia

This case described the consultative public participation process of how the Digital Slovenia 2030 Strategy was co-created to put people at the core of all of its priority areas. An inter-ministerial group came together, recognizing the importance of digital transformation, and created the strategy

„The results of putting people first in digital transformation are priceless. A common path putting people in the center is the only way forward for effective digital transformation.”

under the umbrella of human-centric digital transformation, including the digital transformation of the economy, gigabit infrastructure plan and digital public services strategy, as well as digital compass. The first draft of the strategy was aligned with this working group, and then a consultative process was launched, with several workshops organized, and the public invited to actively participate. Their input on how the strategy could be more human-centered and concrete was gathered and is being implemented.

Human-centric aspects:

- **Facilitated stakeholder collaboration:** As digital transformation as a cross-cutting issue, collaboration between stakeholders is key. The “Strategic Council for Digital Transformation”, is a consultative body appointed by the Republic of Slovenia, includes ministries, academia, economy, NGOs, local communities and is presided by the Ministry to ensure equitable participation.
- **Inclusion:** The Digital Economy and Society Index (DESI) focuses on citizens between 16 and 74. Slovenia decided to not overlook younger or elderly people and the Digital Heroes project was created in the consultative process, providing digital literacy to people above 55 in their rural environment with a traveling classroom, and 4000 participants in 2023 only.

Challenges:

- **Previous lack of implementation:** Only 55% of the measures outlined in the 2020 strategy was implemented. This issue inspired the decision that all future activities need to be reinforced and implemented with the people, for the people.
- **Contact points and access:** While public participation is a complex endeavor, it is worth the efforts because people can raise issues that the government would otherwise not have addressed. For example, one of the recommendations was to create contact points (Digi Info

Points) in municipalities where every individual can ask questions about the use of digital technologies and services.

Recommendations:

- **Wider and local context:** The strategy is aligned with European strategies (Digital Compass, Digital Decade Program, European Digital Rights and Principles), which were worked into the baseline of the local strategy. However, these overarching strategies missed some and locally relevant objectives, which were added in the consultative process.
- **Sectoral strategies:** Horizontal considerations, cross-cutting, and sectoral strategies were adopted. E.g. the Digital Compass that looks at government, skills, infrastructures, and business.
- **Regional strategy as justification:** The European Commission put the individual into the center of digital transformation, which meant additional justification (“an extra boost”) for the approach.

Presentation: Ms. Mojca Štruc, Head of Digital Inclusion Division, Ministry of Digital Transformation of the Republic of Slovenia

Video:

e-Population Register, Estonia

In Estonia, almost all public services are available online. After 99% of services were digitalized, the next step taken was to start focusing on human-centric service design, with the aim of raising the user satisfaction of online public services up to 90% by 2030. One path has been to have at



“Trust, created through transparency is a key to human-centric digital transformation. Estonians trust the government and the digital services, because the government talks about issues instead of hiding any necessary information.”



least 10 life event-based services digitally, e.g. marriage proposals, which is enabled by the widely used e-ID credentials. The presentation included a live demo of the e-Population Register platform.

Human-centered aspect:

- **Trust is created through transparency:** For digital transformation to happen in a human-centered way, people need to trust the government and the tools. This can only be achieved through transparency, meaning that the government has to openly share information about anything that might be going wrong.
- **Simplicity:** The platform is designed to be straightforward and simple. Old paper-based processes cannot simply be digitized as they are. Instead, key governmental services need to be re-designed in a human-centric way by conducting interviews with real users and finding the obstacles users face. Only valuable functions are added to the digital platform.
- **User-centric design:** The platform is designed in an agile manner, based on the input received from the interviews. E.g. all necessary steps are visible before the process is started. There are also more human touches, e.g. when selecting the family names after the ceremony, a hand-writing looking design appears, as if it was an invitation to their own wedding. A warning is also included to remind the users of their rights and obligations.

Challenges

- **Automatization:** Some steps still need human intervention, e.g. scheduling the date via e-mail. An automatic calendar is being developed to circumvent this.
- **Shift of mindset:** It was necessary to learn how to put the human in the center of the development, and not the ministries, or government organizations.

Recommendations:

- **Trust:** As briefly explained above, trust is crucial for citizens to use digital services. This can be achieved through transparency and communication to avoid any suspicions.
- **User feedback:** Constant feedback needs to be collected from the users to develop the service better and achieve user satisfaction. For example, following a consultative process, in only two years, more than half of marriage applications is created online, showing high user satisfaction.
- **Regulation:** It is important to include regulatory advisors and lawyers at early stages to ensure that the regulation is there to support the design of the service.

Presenter: Ms Kaili Tamm, Kaili Tamm, Chief Digital Officer, Ministry of Economic Affairs and Communications for Estonia

Video:

mObywatel: mCitizen 2.0, Republic of Poland

mObywatel is a public mobile app. Originally released at the end of 2017, it used to focus on being a digital wallet and then was developed as a digital assistant for every citizen. This meant a spike in new functionalities between 2020-

“Amidst rapidly to changing socio-economic requirements, while also the process of legislation was ongoing, constant feedback was needed to create transparency, so that the citizens and partners are able to monitor the work in real time and see the progress. A public backlog of features is also included in the app, and all ideas are published before the development begins, so that people can review it.”

2023, which was strictly correlated with current crises

and based on user demand. This is the second version of the app, based on the eIDAS 2 regulation. mCitizen 2.0 is a working prototype and therefore a pioneer in such human-centric digital transformation. It is integrated with various state registers, e.g. student ID card, e-prescription; allows for P2P authentication, downloading data from public records and systems, which can be shared with private or public entities online, new electronic identification means, and private entities can directly share e-services.

Human-centered aspect:

- **Responsive:** The process responsive to the current needs, often correlated with the crisis of the moment. New and necessary functionalities have been constantly added while building the app.
- **Shift towards citizens' needs:** Moving away from the concept of a digital wallet and becoming more of a “citizens' assistant” meant being more transactional by adding new public services.
- **Public consultation:** working with different stakeholders by doing public consultations, exploring options, conducting research, studying social media and analyzing needs and problems the app could solve. The usability tests and quantitative, large-scale studies involved 200 participants, 350 hours of interviews, and resulted in 120 prototype recommendations.

Challenges:

- **Compliance with eIDAS 2:** While the app was being developed in parallel the lengthy legislative process of the legal framework on the electronic identification and trust services for electronic transactions in the internal market was also ongoing the application needed to be aligned with.

- **Privacy and data collection:** An important privacy oriented feature is that data is processed and secured locally, directly on the devices. For this, it was crucial to limit the data processes in the backend on the governmental systems.
- **Prioritizing prototype recommendations:** In the consultative process, more than 120 prototype recommendations were submitted. To navigate the complexity and prioritize, a well-organized, cross-functional and diverse team is needed, which includes public officials, to steer the process.

Recommendations:

- **Legislation:** a dedicated piece of legislation enabled functionalities like the mIdentity Card, which allows to verify the identity when dealing with official matters.
- **Involving municipalities:** Partnering with municipalities in issuing their own local documents, e.g. local public transportation cards.
- **Security:** Especially when it comes to biometric and other private data, it is key to have a very limited backend and have most data being processed locally on the users' device.

Presenter: Ms. Katarzyna Ziólkowska, PhD, Legal Expert, Digital Identity Team, Central IT Unit, Ministry of Digital Affairs, Republic of Poland

Video:

Diia: State in a Smartphone, Ukraine

The word diia means to action, and it is the name of the “state in smartphone” solution from Ukraine. The goal was to make all public services available online, transforming Ukraine into a digital state, leverage technology to modernize governance and services and foster

„We are against the digitalization of chaos: The first step is to simplify the services. We get rid of unnecessary services, to keep only what is needed. Second, less steps in providing services is the better solution.”

innovation. It has 5 main modules: the Diia app and portal,

Diia.Engine, which is the back-end of online services provision, Trembita (integration of x-road from Estonia) as the gateway, e-signatures and e-ID system for unified in-country services and complex online platforms for public services like e-Health and e-Court. Each governmental body has a team responsible for digital transformation, and their work is guided by state policy framework and core principles, including orientation to citizens, i.e. human-centricity: ensuring the needs and expectations of citizens are first and foremost when making decisions regarding the forms and methods of performing state functions.

Human-centered aspects:

- **Consultative, open process:** 800 different groups of people, such as citizens and businesses, state workers as end users are included in the process. In total, more than 25,000 beta testers are available to the development team for user testing from different layers of society.
- **Simplification:** Meaning administrative simplification, which is human, invisible, simple. This includes unified user interfaces and keeping only the services that are actually needed.
- **Privacy:** Identification happens through a QR code that is valid for 3 minutes only. No personal data is exchanged, only when needed for verification.
- **Security:** Officials don't have direct access to citizen information. Nobody can download the databases and look into private information (except as prescribed by law). Data is verified with a digital signature and all changes are logged.

Challenges

- **Interoperability:** The quality of data was not up to standard in some registries, and there were multiple data systems for address registry.

- **Security:** Some systems need to be redeveloped to ensure secure data exchange (e.g. in the case of 6 different data systems for address registry, including geolocation)
- **Technological complexity:** Front-end for citizens, robust back-end for services, secure data exchange between state IT systems, a new government toolbox for new registries and services.

Recommendations:

- **Creating digital teams in governmental bodies:** In every ministry there are CDTOs tasked with creating digital transformation. The function belongs to and is the responsibility of each ministry or state administration body.
- **Open source:** The developed technology is open source because as there are growing concerns of cybersecurity, the many eyes theory of open source supports security.
- **Analysis:** The 4 layers of business processes, legislation, technical analysis and infrastructure need to be analysed before the toolbox can be adapted.

Presenter: Mr. Maksym Shkilov, Advisor to the Deputy Prime Minister on Science, Innovation, Technology and Digital Transformation, Ministry of Digital Transformation of Ukraine

Video:

Smart and Safe Platform, Serbia

The National Contact Centre for Child Safety on the Internet is the first institutional mechanism in the region dealing with the prevention and response to child endangerment in the digital environment. Its 3 core activities are advisory support, forwarding cases of child abuse to relevant institutions and preventative measures.

„Having the right to make mistakes is a prerequisite to human-centric digital transformation. People are not cases or numbers and have to get the chance to be educated to learn how to avoid making those mistakes in the future.”

Advisory support is the main activity, consisting of helping parents, children and other citizens understand how to use new technologies and protect themselves on the internet.

Human-centered aspects:

- **Right to make mistakes:** People are not cases or numbers; they need to be allowed to make mistakes so that they can learn. This education is the key in creating trust in digital technologies beyond fun by learning how to protect themselves, and therefore a prerequisite for human-centric digital transformation.
- **Protection of victims:** Victims do not need to be present. The center informs relevant institutions for them. Issues can even be reported anonymously by submitting screenshots, which are forwarded to the police, prosecutor's office for high-tech crime, or the relevant ministry.
- **Constant learning:** A diverse team comprised of social workers, psychologists, lawyers, teachers informs each other, and is capable of directing cases to the right authorities by sharing their knowledge. They are also educated e.g. on new challenges like what AI poses in cyberbullying.

Challenges:

- **Creating trust:** It takes courage for children to report if they have received explicit photos, as they are ashamed and afraid of repercussions. The platform design needs to communicate that they will not be put in an uncomfortable position, e.g. by allowing them to report anonymously.
- **New issues enabled by digital technologies:** The biggest issue remains cyberbullying, as well as trends about having every school having a gossip channel, but also recruiting by predators

and life-threatening challenges spreading on social media, which the team needs to step up against.

- **Evidence gathering:** Conveying information to police to take action in arresting predators, which is often difficult as there is a lack of necessary information or right evidence when abuse is reported.

Recommendations:

- **Awareness raising** is a prerequisite for human-centric digital transformation, because it ensures that everyone – children and parents – can safely use digital technologies.
- **Efficiency:** by having a contact center specialized in such issues, conveying cases to institutions can take place with much better efficiency.

Presenter: Ms. Oliviera Pecić, Educator and Operator, National Contact Centre for Child Safety on the Internet; Ministry of Information and Telecommunication, Serbia

Video:

GovTech Lab, Lithuania

The GovTech Lab's goal is to incorporate human-centricity in digital innovation. Lithuania is already an advanced digital nation, not only in terms of the digitalization of the government, but also the digital skills of the public and their desire to uptake digital

„Citizens are using tools developed by the IT industry and have increasing expectations of what kind of experience they want from the government. Similarly, public sector employees also want more of the public sector as an employer.”

innovations. However, the benchmark of what is advanced

is moving quickly: technology is advancing extremely fast. The GovTech Lab was created within Lithuania's Innovation Agency to collaborate with the startup sector, not by outsourcing, but enriching the public sector by using their niche expertise. This public sector team encourages the creation and the use of digital innovations that solve public sector challenges by providing public sector organizations with methodologies, tools and resources to collaborate with innovators and co-create GovTech solutions.

Human-centered aspects:

- **Adapting startup approaches:** The public sector sees how disruptive technologies and solutions are created that push the boundaries of *user-centricity, intuitiveness and responsiveness* in the digital innovation, startup and entrepreneurial world, and aims to adapt these approaches.
- **Solutions alleviate existing pains:** Thanks to a structured open innovation program, the projects developed alleviate existing pains instead of merely developing yet another solution. The process ensures that solutions help either employees or citizens and understand the deeper challenge.
- **Users and design thinking at the core:** training and workshops to improve relevant skills, and piloting and testing with users to identify existing solutions to identify the ones that are intuitive enough and could catch on.
- **Making innovation more fun:** the further involvement of public servants depends on their experience, so it has to be pleasant. In addition to the technical and procurement work, cohorts are created with kick-off events, demo days, community building activities.

Challenges:

- **Slowness:** Because of the nature of the public sector, it is difficult to keep up with the speed of technological innovation. This is addressed through strategic cooperation with the public sector.
- **Lack of experimentation and expertise:** There is a general lack of experimentation and niche technological expertise within the public sector. The GovTech Challenge Series is a systemic answer to this issue, which also responds to the need for a broader pool of ideas to choose from.
- **Sustainability of innovations:** Public sector innovation processes often stop after consultations, or one-off formats like hackathons. The “design contest” is essentially a procurement method that allows private-public collaboration to become systemic and innovation less risky.

Recommendations:

- **Creating a new industry:** By going beyond one department or even only the public sector, strategic collaborations are an economic opportunity to create a new industry of startups.
- **Getting started:** If other governments wish to deploy similar approaches, they should start with small scale pilots: 3 challenges, without funding, incorporated in traditional, existing services, and starting with public sector employees.

Presenter: Ms. Arūnė Matelytė, Manager and Co-Founder of GovTech Lab, Innovation Agency

Video:

People-Oriented Smart City, Latvia

Liepāja City is a partner and member of various larger networks, including the European Digital Innovation Hubs (EDIH) and the Digital Accelerator of Latvia (DAoL). The city sees these networks as important resources to promote the competitiveness of production processes, products or

“To succeed and to be competitive on the global scale, we need to go the same way. It’s about experience sharing. It’s about knowledge sharing.”

services of SMEs, using digital technologies; and also as a way to gain access to technical knowledge and experiments across Europe. These partnerships are a key to understanding how a small town can approach a regional, or global scope. The strategy is directed towards global networks, which is also demonstrated by being the European Capital of Culture in 2027 in Latvia, as well as becoming a climate neutral and smart city by 2030.

Human-centered aspects:

- **Infrastructural development for the environment:** the smart city approach is not only human-centric, but also makes environmental considerations, including infrastructures of transportation and buildings combined with sensors and online data, or becoming completely paperless.
- **Usefulness:** while becoming paperless, the public sector app is being developed not only as a “nice to have”, but in a manner that citizens accept it and use it. For example, it facilitates two-way communication between citizens and the municipality.
- **Constant development:** the app is never considered as finalized, or ready. It is constantly under development, as new, useful functions are being added.

Challenges

- **Public sector innovation:** There is no easy way to implement new processes and positive change. New strategies have to be embedded into the city strategy and can only be implemented step by step. Different stakeholders need to be satisfied.
- **Process design:** the goal is not as simple as to digitalize or transform *something*, but this has to be done in a smart and sustainable way, which is challenging in the context.

Recommendations:

- **Regional strategies:** common strategies and regulations can be a positive, encouraging measure that influences the work positively. Being in line with regional (e.g. European) strategies allows for experience and knowledge sharing to take place. This is seen as positive even if funding is not necessarily attached.
- **Communication and transparency:** when developing digital transformation, it needs to be clear how the new tools benefit the citizens and other stakeholders. They need feedback and follow-up to know that their voices are heard.
- **Diversity:** the diverse nature of stakeholders, including citizens, need to be taken into account. For many, getting started might be difficult. However, once they get to know the process, they can adapt fast. E-signature has for example allowed the city to have all tenders and support applications be submitted online and become a paperless municipality.
- **Digital twin:** Done in a human-centric manner, and striving towards efficient usage, the development of digital twins is recommended.

Presenter: Mr. Salvis Roga, Deputy Chairman of Liepāja City Council

Video:

Community Networks, Georgia

Digital transformation to develop society is one of the main priorities of the Government of Georgia. To achieve this, addressing the digital inequality and foster the digital economy has been a crucial step, especially in the most remote areas of Georgia. Human-centric achievements have been reached by the Georgian government in close collaboration with regional communities – who maintain and operate the networks – and the private sector through community internetization projects. The Ministry of Economy and Sustainable Development acts as policy maker and coordinating body for development, but national policy is also aligned e.g. with the EU's digital single market strategy.

„Human-centric private-public partnerships and collaboration allow for communities to be the owners of infrastructure and have access to digital governmental services and economic opportunities. In this model, the state facilitates the development, while some financial contributions and cooperation with donor organizations is also foreseen.”

Human-centered approach:

- **Meaningful and equitable access:** In the digitalization process, there is focus on the digital skills and literacy of women, ethnic minorities, and individuals with disabilities. Furthermore, Internet access is created in high mountainous regions through community internetization initiatives.
- **Socio-economic benefits:** With access to the internet, younger generations have a reason to stay in remote areas, become entrepreneurs or work in the tourism industry. The population gets a chance to evolve and develop.
- **Ownership:** The communities are provided with training and vouchers, and the state supports with funding, but they are also owners and maintainers of the infrastructure. This leads to sustainability, e.g. in the case of a 5-year-old community network project.

Challenges:

- **Internet access:** While the right to access is guaranteed by the constitution of Georgia, the ongoing digital divide between urban and rural areas creates challenges. Broadband fixed internet and mobile 5G networks are being deployed (see e.g. “Log-in Georgia” project), but disparities exist due to major geographic challenges.

- **Lack of business incentive:** There is simply no business incentive for private telecommunications companies to reach high mountainous and sparsely populated territories. Serving communities of under 200 people is also not covered by state internetization program.

Recommendations:

- **Groundwork - access for everyone:** Creating access is not just about economic wealth and enhancing connections. In rural areas internet access can be a matter of life, for example having access to a doctor when injury occurs. Furthermore, access is the prerequisite of human-centric digital transformation, e.g. access to public e-services.
- **Human-centric private-public collaboration:** Wherever possible, co-financing between the state and donors should be encouraged. The community network project involves communities and telecom operators, who also provide in kind support. The project responds to 9 out of 17 SDGs.
- **Legislation:** Fortunately, Georgia's legislation allowed for the support of community networks, but specific legislation and collaboration with local telecommunications operator might be needed.

Presenter: Ms. Sophie Tvalavadze, Deputy Head of Department, Ministry of Economy and Sustainable Development of Georgia

Video:

Front-Office Digitalization Platform, Moldova

This case highlights the winner of the WSIS Service Design Special Prize⁶, the Front Office Digitalization (FOD) platform of Moldova. The prize spotlights innovative and impactful government services that are designed based on the building block approach but are also optimized for scalability, interoperability,

“The Front-Office Digitalization platform represents a citizen-centric whole of society approach to digitalizing government services and four key principles: a seamless approach, simplifying experience, standardized approach, and a friendly experience for the beneficiaries.”

and adaptability, and highlights the need to address and better serve the citizen’s needs through improving, innovating or developing government processes. In 2023, over 50 nominations were received from around the world. The e-Government Agency of Moldova was selected with the FOD platform, which builds on the complete eGov ecosystem that Moldova has been developing for the past 10 years.

FOD is used to transform public services and interactions with citizens. It is a framework that allows rapid design and development of front offices for digital government services, with components that can be used to easily configure and develop individual systems for governmental service providers and it can be integrated with existing service provider back office.

- **Reengineering methodology:** Building on the reengineering methodology, FOD focuses on reusing data and other available electronic platforms and tools to simplify and eliminate public service requests, minimize the time needed to respond to requests and ensure efficient back-office operations. A scalable and sustainable technical infrastructure is created on which beneficiaries can develop services. Thus, users do not have to physically go to the public service providers to request, pay, or receive the service.
- **Integration and interoperability:** This framework is integrated with the entire government system, i.e. the building blocks, and it has a connection with the digital registries, identity,

⁶ This prize was created to award examples of digital government services and the teams behind them, in partnership between GovStack and the ITU World Summit for Information Society (WSIS). GovStack promotes citizen-centric, human-centric approaches, supported by the ITU, in partnership with the Government of Germany, the Government of Estonia and the Digital Impact Alliance. It brings together digital leaders and adopters from across the globe to collaborate on bringing of building out the toolbox for developing government services based on a whole of a society approach.

verification, payment, notification and others like registration workflow and other building blocks.

- **Practical applications:** FOD is comprised of practical applications, such as applying digitally to receive an electronic duplicate of marriage or birth certificates, real estate services, criminal records etc. Essentially, the most requested services were digitized based on the logic of a horizontal review of existing services, and from those ones we selected the most critical, popular ones. These were made available in a digital format.
- **Human-centric benefits:** having a seamless approach within all services. Throughout the FOD platform, the user-centric approach is being implemented. The service is built starting from the point of view of the beneficiary, and by trying to simplify his/her experience. This results in a standardized approach for public services and a friendly experience for our beneficiaries.

Presenters: Ms. Valentina Stadnic, Digital Services Expert, and Regional Coordinator for the GovStack Initiative in the ITU Office for Europe, presenting an interview recording with Olga Tumuruc, the former Head of the e-Governance Agency Moldova, introducing the FOD platform.

Video:

Key Recommendations

This Compendium proposes 8 Key Recommendations based on common learnings from all cases. It is a comprehensive list that represents diverse contexts the cases are embedded in; thus, it is possible that some aspects outlined here might already be in place in other ecosystems. These points are created as a checklist, to support Governments and ICT Stakeholders, regardless which stage of human-centric digital transformation their project or programme has already achieved:

<h3>Universal Connectivity and Skills</h3>	<ul style="list-style-type: none"> • The prerequisite to human-centric digital transformation is universal internet access. • The groundwork begins with creating equitable access, be it infrastructure for small communities in extremely remote areas, or elderly people who need skills to be able to use governmental e-services. • Inclusion cannot overlook anyone, if digital transformation is to serve all humans.
<h3>Embrace a Mindset Shift</h3>	<ul style="list-style-type: none"> • The human perspective needs to be prioritized over ministries and government organizations: whether speaking of citizens, public sector employees, or other stakeholders. • For example, moving from a digital wallet concept to a "citizens' assistant", citizens' needs can be better served by this different perspective on the human-centric role of public services.
<h3>Start with Existing Pains and Use Case</h3>	<ul style="list-style-type: none"> • Design with a focus on specific needs rather than adopting technology haphazardly. • Structured open innovation programs can be used to develop projects that address existing, deeper challenges and provide real solutions for employees or citizens. • Ensure public sector apps are not just "nice to have" but are designed for acceptance by citizens. • In process design, prioritize smart and sustainable approaches over simple digitalization or transformation.
<h3>Use Consultative, Participatory Processes</h3>	<ul style="list-style-type: none"> • Engage in participative, consultative, and facilitated collaboration with stakeholders to design strategies that are implemented with and for the people. • Recognize human-centric digital transformation as a cross-cutting issue. • Enable citizens through consultative processes to raise issues that may go unnoticed by the government, contributing to project recommendations that are crucial, but would otherwise not have been developed.
<h3>Mitigate Risk and Enable Innovation</h3>	<ul style="list-style-type: none"> • Startup funding challenges can be navigated by leveraging EU funding to bridge initial periods, and procurement can be used in a systematic manner to mitigate risk and enable innovation. • When there is a lack of business incentives, private-public-community partnership models or viable business models (B2B strategies) can be considered.
<h3>Create Trust through Transparency</h3>	<ul style="list-style-type: none"> • Build trust in human-centric digital transformation by prioritizing transparency, ensuring clear and open communication in case of issues, and acknowledging that personal data is at stake. • Establish transparency through constant feedback, enabling citizens and partners to monitor progress in real time. • Embrace open source technology for transparency and cybersecurity, leveraging the "many eyes" theory to enhance security. Prioritize clear communication on how new tools benefit citizens.
<h3>Human-Centric Private-Public-Community Partnership</h3>	<ul style="list-style-type: none"> • Encourage human-centric private-public collaboration at different levels. • Intrapreneurship can be leveraged within startup teams, where public sector individuals in state-startups accelerate processes with their expertise and early involvement of regulatory advisors and lawyers ensures regulatory alignment in service design. • Digital transformation teams embedded in each governmental body is a good practice. • Adaption of user-centric approaches from the startup world into the public sector can push the boundaries of innovation.
<h3>Formulate National Policies and Regional Strategies</h3>	<ul style="list-style-type: none"> • Policies at the national or regional level can ensure alignment with legal requirements and data protection regulations and promote consistency, while dedicated legislation can enable specific new functionalities. • National strategies that align with broader European regional strategies can be supplemented with locally relevant objectives to become comprehensive. • Regional strategies can provide an extra boost of legitimacy to initiatives. Such measures encourage collaboration and knowledge sharing and contribute to impactful transformation.

Principles of Human-Centric Digital Transformation

The following 5 principles are derived from the cases, which have been systematically analyzed to extract the most common technical and design principles for human-centric digital transformation. These include learnings from the most innovative approaches from the private sector, and – representing the other side of the same coin – highlight challenges pertinent to the public sector:

Privacy and data security

- Prioritize privacy and security considerations in design.
- Verifying data with digital signatures and logging all changes are stringent security measures.
- Ensure full control over data for all users.
- Emphasize local processing of private data directly on personal devices, limit backend processes on governmental systems.
- Personal data should only be exchanged when legally necessary.
- Acknowledge the need for redevelopment in some systems to ensure secure data exchange.

Responsiveness

- Ensure responsiveness to user needs.
- While some projects might be built as responses to current crises, others are based on long-term consultative processes with stakeholders.
- The tools and platforms built should be viewed as continuous work in progress, constantly evolving with the addition of new and necessary functionalities.
- Foster constant user feedback for improvement and allow for the prioritization of functionalities shared in a consultative process.

Interoperability

- Interoperability is considered crucial - yet challenging.
- At the national level, real-time information exchange between agencies is seen as a prerequisite for digital transformation.
- On the regional level, alignment with current EU strategies is emphasized.
- Challenges include substandard data quality and potentially multiple existing analogue data systems.
- The interoperability of newly built platforms with government services, such as digital registries, ID verification, or payment systems is fundamental.

Agile approaches

- Utilize agile design principles and create well-organized, cross-functional, and diverse teams, including public officials.
- Implement agile design based on input from interviews, usability considerations, and add a human touch.
- Promote learning and information sharing within diverse teams to stay informed on new challenges.
- Prioritize users and design thinking, offer training, workshops, and prototyping/piloting to enhance skills and to identify intuitive solutions.

Simplicity

- Prioritize simplicity to ensure user-friendliness. Not overwhelming the user with functionalities can also contribute to a feeling of security.
- Key governmental services are to be identified and re-designed by removing the obstacles users might face, resulting in straightforward and simple platforms.
- "Reengineering methodologies" create opportunities to redesign complex services and fostering citizen satisfaction.
- Advocate for administrative simplification with a human-centric approach, emphasizing unified user interfaces and retaining only essential services.

Conclusion

As the cases showed, there are different agents who can stimulate human-centric digital transformation. It can be done on the governmental level, transforming all public services centrally (see e.g. Albania, Estonia, Ukraine). The government can also create its own start-up incubator (e.g. France) or create ecosystems for systemic collaboration with the private sector (e.g. Lithuania). Start-ups from the public sector can also propose to transform particular sectors (e.g. Czech Republic) and be strategically supported by the government in their endeavor (e.g. Hungary). In many instances, national strategies might not be enough, and further human-centric private-public collaboration is needed to create equitable access (e.g. Georgia), a crucial prerequisite of digital transformation.

The human-centric digital transformation process is seen by many technical experts as an opportunity to finally systematically address challenges and shortcomings of the public sector, including simplifying or re-engineering complex bureaucratic systems, saving time and money for the citizens, and creating thorough consultation processes with all stakeholders. Many technical experts highlighted that the inflexibility of the public sector hinders innovation. As an answer to this issue, governments are stepping up and either adapting approaches from the private sector, or are creating close collaborations with it by learning to use constant exchange and agile methods to accelerate processes.

Furthermore, human-centric private-public-community collaborations are explored to cover any last-mile gaps. We saw that regional strategies can increase international knowledge exchange, and national regulations and policies can foster consistency in approaches. The two need to be combined to achieve inter-regional collaboration while also taking local contexts into account.

The socio-economic benefits of human-centric digital transformation are clear. However, the transformation process also carries worries and threats with itself, including leaving citizens behind, not safeguarding personal data, “digitizing the chaos” and creating solutions without a proper use case. Many cases covered in this Compendium offered hands-on solutions to avoid such pitfalls.

One final consideration is how human-centric digital transformation could also be linked more closely to environmental sustainability. A paperless municipality – or country – is a good start, and it can be enabled by moving all public services online. We have also seen a case in which the smart city approach and digital twins helped further reduce negative environmental impacts. It is yet to be seen if environmental considerations can become a core aspect on human-centric digital transformation.

The original goal of this Compendium was to enhance the understanding of human-by design features of digital transformation by presenting cases from the Europe region. In the future, we hope to continue this knowledge sharing approach and support exchange between further stakeholders through appropriate formats.