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Blueprint for next steps in eGovernment applications in Europe

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EXECUTIVE SUMMARY

This is deliverable report *D4.1: Blueprint for next steps in eGovernment applications in Europe*, of the European Commission Horizon 2020 funded project CLARITY (grant agreement number 693881). The CLARITY project aims to support European Member states in their pursuit for greater trust, transparency and efficiency within government via the increased uptake of open eGovernment initiatives.

This report presents an initial blueprint of the next steps required for the provision and uptake of eGovernment applications and services to enhance accountability, transparency and trust in each of the following four public sector areas: (a) general practice health, (b) local government, (c) small business and self-employed and (d) disability in the EU. The blueprint includes guidance on: 1) available and emerging solutions; 2) emerging business models; 3) technology and data gaps; 4) emerging data models; 5) policy gaps and 5) social considerations.

Table 1 summarises the key findings of this deliverable.

Table 1: Key findings of D4.1

Main emerging solutions	Main emerging business and data models
<ul style="list-style-type: none"> • Mobile services • IoT applications • Big Data solutions • Machine Learning applications • Blockchain technologies • Ontologies and shared vocabularies • Open source and re-usable component management 	<ul style="list-style-type: none"> • Participants in co-creation • Providers of consulting and assistance services on open eGovernment • Public servants as community managers • eGovernment services developed by third parties • Reuse of open eGovernment solutions • Linked and open data
Main gaps	Social considerations
<ul style="list-style-type: none"> • Implementation of directives and regulations • Digital training for specific sectors • Multilingual services • Mobile applications • Interoperability • Availability of open data 	<ul style="list-style-type: none"> • Change in the labor force • Trust in eGovernment services and government itself • Equity and Digital divide • Quality of life • Public-sector transformation • Source of innovation
Main recommendations	
<ul style="list-style-type: none"> a) Further development of eDemocracy tools b) User-centered design c) Service personalization d) Universal accessibility of services e) Services in multiple languages f) Ubiquitous services 	<ul style="list-style-type: none"> g) Meeting the once-only principle h) People's access to their own data i) Openness j) eProcurement services k) Cybersecurity

The findings of this report, as well as the feedback of an evaluation workshop and a consultation process, where different stakeholders will be asked for their opinions and suggestions, will guide the preparation of a definite blueprint, which will be the main component of deliverable D4.2. This last version of the blueprint will provide a timeline of a list of recommendations for civil servants and policy makers at national and EU level. It will take the form of an action plan based on their interdependencies and a roadmap of R&D initiatives alongside it, necessary to accelerate their development.

1 INTRODUCTION

There is an existing demand on governments to provide an environment that ensures openness and efficiency in the delivery of services. ICTs can help here, but this requires an optimization of the role ICTs play. How should ICTs be integrated into governance and include citizen engagement and participation to enhance accountability, transparency and trust? There are not only technical issues, but also social, organisational and cultural ones.

This deliverable report *D4.1: Blueprint for next steps in eGovernment applications in Europe*, presents an initial blueprint of the next steps required for the provision and uptake of eGovernment applications and services in each of the following four public sector areas: (a) general practice health, (b) local government, (c) small business and self-employed and (d) disability in the EU. Focusing on particular sectors does not mean that the proposed recommendations do not follow a holistic approach to open eGovernment, they just highlight some particularities regarding each sector.

This deliverable draws on previous deliverables from WP2 and WP3¹ and integrates and complements their findings on:

1. available and emerging solutions
2. emerging business models
3. technology and data gaps
4. emerging data models
5. policy gaps
6. social considerations

This initial blueprint will be exposed for feedback: i) at a validation workshop with multiple stakeholders involved in encouraging the adoption of eGovernment applications in Europe, and ii) via a range of assessment activities reaching out to the project contact list and wider network. Feedback from these evaluative activities will be presented and integrated to enhance the final blueprint to be presented in deliverable D4.2.

The report is structured as follows:

- Section 2 summarises the general recommendations for the provision and adoption of open eGovernment services in Europe.
- Sections 3 to 6 provide details for each of the aforementioned sectors, so that people interested in just one section do not need to read the other three sections to get a complete picture. Each section has information on:
 - Open eGovernment in the corresponding sector
 - Main available and emerging solutions
 - Main available and emerging business and data models

¹ All CLARITY deliverables are available on the project website at: <http://clarity-csa.eu/resources>

- Main gaps in policy, technology and data
- Social considerations
- Recommendations based on the previous subsections
- Section 7 explains the validation plans.

2 MAIN/GENERAL RECOMMENDATIONS

This section consists of a summary of the commonalities across sectors. It highlights the main recommendations for the provision and uptake of open eGovernment services to enhance accountability, transparency and trust.

a) Increase in use and further development of eDemocracy tools

eDemocracy enhances citizen and businesses engagement and participation in government decision making processes such as policy making and budgeting. It is fundamental for user adoption and for building trust towards the public sector.

In general eDemocracy and eParticipation tools are not offered as services on eGovernment portals in the EU. eGovernment websites need to be transformed in order to support increasing engagement and participation of citizens and businesses, providing features such as web forums, discussion spaces and social media interaction.

However, a shift in public service delivery and governance needs to accompany a move towards eDemocracy so that citizen input is adequately taken up and used. For instance, there is little sense in creating a consultation service for citizens to suggest where money should be spent if there are not enough people to read and handle the amount of suggestions.

b) User-centered design

Awareness of citizen and businesses expectations when interacting with the public sector through eGovernment services may facilitate the interaction between public administrations and users. These expectations are related to usability goals, user characteristics, tasks and workflow of the service.

Articulating these expectations requires service designers not only to analyse and envision the way the service will be used by citizens and businesses, but also to validate their assumptions. Emerging methodologies and tools for co-creation in general, and particularly for co-creation of services, give support to this action; these methodologies should consider different groups within society, not only majority ones, but also minority or socially-excluded ones, e.g., migrants, elderly, disabled and computer illiterate.

The uptake of user-centered design requires to train service staff in eService design, methodologies, and facilitation of user participation.

c) Service personalization

Personalization tailors a service to specific individuals or segments of individuals' needs. It is based on the knowledge of the user or group of users' profile and is used to improve user satisfaction.

Personalisation may involve having a personal portal of customized eGovernment services according for example to age, IT skills or educational background.

d) Universal accessibility of services

Considerations for universal accessibility services are related to alternatives for audio content, such as transcripts and captions or sign language; page structure and content, which need to be properly coded so that they can cater to text-to-speech synthesis or audio descriptions; and textual content that follows Easy-to-Read norms.

Accessibility options are often few and ill-locatable on government service web-portals. Public administrations should design digital public services that are inclusive by default and cater to the needs of people with disabilities.

Several Member States have adopted measures based on internationally used guidelines, WCAG 2.0, for the design of accessible websites. However, those measures often relate to different versions or compliance levels of those guidelines. Due to these differences, developers' competitiveness and growth are hampered by the additional costs they would incur in the development and marketing of cross-border web accessibility-related products and services.

The approximation of measures at the national level to measures at the Union level should be based on agreed accessibility requirements for websites and mobile applications of public sector bodies. It would reduce uncertainty for developers and foster interoperability.

e) Services in multiple languages

A great majority of eGovernment web portals in the EU are available only in the native language or in the native language and English; the English version often only provides information and not all of the eGovernment services that are provided in the native language.

Language support should include not only the translation of website content but should also include the translation of forms and documents. This is under-developed and it is hindering access to services by non-native speakers. Such is the case eHealth services and services related to SMEs and self-employed users.

f) Ubiquitous services (computers, mobiles, tablets)

In general, there has been an increase in mobile “apps” but particularly only 1/3 of public sector websites are mobile-friendly in the EU. Additionally, some mobile apps for eGovernment services are provided in eGovernment portals in the EU, but in general there is a lack of mobile apps.

For general health practice, there has been a call to integrate mobile health infrastructure with clinical information systems and the electronic medical record, to support chronic disease

patients through messaging and reminders for self-management support, laboratory test scheduling, and medication management. There is a need for more mobile solutions and better network connections to allow staff to be connected while on home visits.

Lower-tech SMEs, would greatly benefit from low cost smartphone and mobile solutions.

As mobiles are fast becoming the main device through which people access the internet, it is imperative that more services are provided through mobile friendly websites or apps that would open access to a greater number of citizens.

g) Meeting the once-only principle

The once-only principle states that a user should not have to supply the same information more than once to public administrations. In order to meet this principle, eGovernment services need to be interoperable including across-borders interoperability. National administrations should take-up the European Interoperability Framework (EIF). eIDAS services, including eID and eSignature are also necessary in order to meet the principle.

The use of open source software, open standards and open API will result in more open and scalable ICT systems for public service delivery. This will pave the way for the integration of systems and the implementation of the once-only principle for citizens and businesses.

Proposals to realize this step include the Single Digital Gateway, the interconnection of all Member States' business registers, the electronic interconnection of insolvency registers, the use of digital solutions throughout a company's lifecycle, the extension of the Single Electronic Mechanism for registration and payment of VAT, the single window for maritime transport, the Electronic Exchange of Social Security Information, the EURES European Job Mobility portal, cross-border eHealth services, and the exchange of electronic evidence between judicial authorities.

h) People's access to their own data

Allowing citizens to “own”, use and amend their data could go a long way to make them more invested in the services they use and more trusting of government. Additionally, it would cut down on information queries by governments and allow for faster resolution times. Yet, only 55% of the EU Member States make this access possible for citizens.

In health care services, in particular, patients want to receive personalised solutions and want to share responsibility for their own care. For this purpose, patient access to their own medical data is important.

It is important to understand how people think about their data in relation to public services and how they would like to interact with it. Also, people should know if their data is linked to data from other services. Research to comprehend how citizen controlled data is understood and accepted in government is also vital to drive this trend forward.

i) Openness

Public administration's open data that is machine-readable and that is capable of being shared and distributed allows the development of solutions that cater to the increasing demand for transparency, accountability, and responsiveness.

Data and algorithms transparency is essential for digital trust and appropriation of emerging technologies. An important shift deals with the control of data used and the intelligibility of algorithms, not only on the Internet but also on other connected services.

j) eProcurement services

Providing eProcurement, eTender and eInvoicing services is very important to level the playing field and ease access for all businesses to the information and thus develop the potential for bidding for public contracts procurement opportunities and tenders.

The transition of European Member States towards full e-procurement and use of contract registers is necessary.

The focus should be set on setting up eProcurement and eTender portals that are easily accessible for businesses of all sizes. As with other eGovernment services, a user focused approach would be necessary to gauge both the interest and the usefulness of such portals and how they can be designed to ensure maximum take-up by businesses.

k) Cybersecurity

Security plays a key role in the provision and take-up of open eGovernment services. People will not trust and consequently use open eGovernment services if they are not convinced their data are protected and the applications are reliable, tamper-proof and available when required. Public administrations should provide a means so that both the user and the administration can be sure that they are interacting with the intended counterpart. Data should be stored in such a way that only authorised entities can access them and they can be recovered after a security incident.

More research for the development of cybersecurity tools and technologies is needed in order to improve existing solutions and to answer the challenges that new and emerging technologies (e.g., cloud and IoT) pose.

3 NEXT STEPS FOR OPEN EGOVERNMENT SERVICES RELATED TO GENERAL PRACTICE HEALTH

3.1 OPEN EGOVERNMENT IN GENERAL PRACTICE HEALTH

Open Government is a government with high levels of transparency with an emphasis on government accountability, meaning that the public should have access to government-held information and be informed of government proceedings. It includes expectations for increased participation and collaboration of citizens, businesses, employees and other entities in government proceedings, through the use of modern, open technologies². *Government 2.0* refers to government itself as an open platform³ that allows people inside and outside government to innovate and that evolves through interactions between the technology provider and its user community. *eGovernment* refers to the use of computers and other devices to provide information and services to the public. *eGovernance* extends the scope of eGovernment to include citizen engagement and participation in governance⁴.

This section focuses on Open eGovernment services in the General-Practice-Health sector. General practice provides person centred, continuing, comprehensive and coordinated whole person health care to individuals and families in their communities. As a sector, general practice, its practice teams and their primary health care relationships comprise the foundations of an effective health care system⁵. Health systems can greatly differ around the world in general and in the EU in particular and public administrations play different roles in each of them. In some countries, health care is free and universal while in others, patients have to pay partially or completely for their health care. Moreover, practitioners can belong to the public sector and/or the private one.

Ultimately, open eGovernment services in this sector are twofold. On the one hand, there are health services provided to citizens and, on the other hand, there are services provided to the different practitioners involved in the general-practice-health sector (such as, doctors, nurses, care providers, pharmacists, etc.). Furthermore, service providers should also take into account the requirement of cross-border solutions, both at inter- and intra-national levels since differences in this sector are not only between member states, but also between regional administrations from the same country.

The sensitive nature of health data makes data protection especially important in this sector. Openness in solutions must be developed carefully and must ensure that available open data are conveniently anonymised.

² <https://opensource.com/resources/open-government>

³ <https://techcrunch.com/2009/09/04/gov-20-its-all-about-the-platform/>

⁴ https://en.wikipedia.org/wiki/E-government#Comparison_with_e-governance

⁵ <https://www.racgp.org.au/becomingagp/what-is-a-gp/what-is-general-practice/>

3.2 SOME AVAILABLE AND EMERGING SOLUTIONS

In this section, we present several solutions that have already been proposed or are being studied in this area. These solutions go in the direction of providing improved open eGovernment services for General Practice Health, especially using emerging technologies.

Administrative procedures for citizens regarding General Practice Health

- Online appointments. Citizens can make (and cancel) online appointments with their general practice doctor and nurse

Example: In Spain, it is a widespread solution in all regions.

- Electronic prescriptions. In some Member States, prescriptions for medicines can be issued electronically by a doctor and pharmacies can dispense medicines according to them.

Example: In Finland, the national Prescription Centre contains all the electronic prescriptions and the dispensing records entered on them by pharmacies. Based on the information held in the Prescription Centre, any pharmacy can dispense their medicines to citizens. Spain has also e-prescriptions, but there is no national repository and so far, only a few regions have interconnected their prescription systems.

- Access to their own data. Although this is not common, in some countries, patients are allowed e-access to their medical data and they can decide who else has access to them.

Example: In Malta, patients and their doctors can access the following health data: Mater Dei Hospital (MDH) case summaries (inpatient discharge letters from 2008 onwards); current Pharmacy of Choice medicines entitlement; lab results and medical image reports (biochemistry, haematology, and immunology; toxicology from 2008 onwards; microbiology, virology, blood bank, histology and cytology from December 2012 onwards), and future outpatient / clinic appointments at government hospitals (as supplied by the Patient Administration System).

- One-stop shop. A single entry point to access the open e Government services for general practice health is available in some countries, many times among other health services.

Example: Denmark has an entry point to a number of interactive and transactional services for citizens, including electronic booking of appointments with a general practitioner, viewing appointments with the healthcare services, receiving a reminder prior to visits, sending secure emails to healthcare authorities and renewing drug prescriptions.

- IoT applications. IoT can be used as sensors of different health-related measures such as heartbeat, blood pressure, temperature, insulin and glucose levels, etc. and can also warn (citizens themselves, doctors, emergence units) when those indicators are alarming.

- Mobile services. Not many general-practice websites are responsive nor there are many mobile applications yet.
- Personalization of portals. Personalization of portals and services that are adaptive to the user profile and requirements is still under-developed.
- Telemedicine. The use of ICT to provide general practice health care from a distance can be used to improve access to medical services when rural settings, lack of transport, lack of mobility (i.e. In the elderly or disabled), decreased funding or lack of staffing make access difficult. It can also help in critical care and emergency situations.

Administrative procedures for practitioners regarding General Practice Health

- Patient Data Repositories where healthcare units enter and look up patient records in a secure way.

Example: Portugal's Rede Telemática da Saúde® allows the access to clinical information and promotes the communication between certified health professionals, contributing for a better access to medical care.

- Online registration. These kinds of services can be useful for practitioners both in order to register themselves and in order to register patients or insured persons into the corresponding health system.

Example: The Croatian Institute for Health Insurance allows for submission of application for registration and deregistration of insured persons, and change of information about the insured persons in an electronic manner. Registration for the service is also available as an online service.

- Big Data and Data analytics. The statistical analysis of (anonymised) health data can help practitioners to learn about prevalence, drug (mis)use, etc. However, emerging technologies such as data mining and deep learning can go further and provide insights to possible illness causes, help in the diagnosis and suggest treatments.
- Ontologies and shared vocabularies. Understanding is crucial when dealing with health matters. The use of standardised terms and the relations of other terms to these standards and among different vocabularies can help practitioners to understand health reports from other practitioners and improve search and retrieval of health records.

eIdentification

- eHealth (insurance) cards. Most Member States have particular identification schemes for the health sector. They issue cards for their residents, which, in many cases, comprehend the European Health Insurance Card (EHIC), and which have different associated services depending on the country.

The use of complementary eIDs can make the once-only principle more difficult to achieve, but, on the other hand, can make privacy issues easier to deal with.

Examples: Austria's Chipkarte e-card is a system that connects patients, providers, hospitals, and pharmacies' through Europe. Belgium's and France's cards enable direct settlement of certain medical costs, while other costs are reimbursed through mandatory/complementary private social insurances.

- There are also particular cards for health practitioners.

Example: In Croatia, the CIHI card is issued to all health care practitioners and used to access the health information system.

- Some countries use their eID cards.

Example: In Finland, citizens can choose to have their health insurance data included on their eID cards.

3.3 SOME AVAILABLE AND EMERGING BUSINESS AND DATA MODELS

- Government and general practice health stakeholders that initiate, design, or implement open eGovernment services together. This implies the provision of co-creation spaces and the emergence of job positions needed for them.
- Companies that provide assistance to general practice health stakeholders to access and use open eGovernment services regarding general practice health, such as in-person attention and call centres.
- Companies that provide assistance to open eGovernment providers regarding compliance to laws, directives, regulations, etc.
- Personnel that support general-practice-health services in eGovernment portals by doing tasks such as online chatting, forum management, email communication and community management.
- Companies, organisations and public administrations that create (innovative) eGovernment solutions using open data and services provided by public administrations.
- Companies that offer consulting services to public administrations on technology roadmaps, in order to enable eGovernment.
- Open data that are published as linked data facilitates the connection of different information sources, and gives rise to new and innovative applications that improve the search and relevance of retrieved information.

3.4 GAPS: POLICY, TECHNOLOGY AND DATA

Policy

- The GDPR lists health data, genetic data and biometric data as sensitive personal data and permits Member States to introduce further conditions around the processing of such data. However, there are still many countries which do not have specific policies for this data.
- The NIS directive, which is also important to protect health data, has not been transposed in all the Member States yet.
- Since the eIDAS Regulation does not impose a particular eIdentification model on Member States, an analysis of the incorporation of identifications already used in the health sector seems relevant.
- A digital training policy specific for general practice health practitioners could benefit the sector.

Technology and Data

- Low technology skills of general practice health staff.
- Little availability of mobile applications.
- Low interoperability of general-practice-health eGovernment services.
- Few open data are deployed in an appropriate available way.
- Further research needed on the application of artificial intelligence in general-practice-health eGovernment services. For instance,
 - Decision-support systems
 - Natural language processing

3.5 SOCIAL CONSIDERATIONS

- As in other areas, the use of ICTs in government services for general practice health will change the labor force in this sector. Current jobs will disappear and some of the new ones will only last for a short time. For instance, less and less people will be needed at health centres to make appointments; for a certain time, people assisting patients to make online appointments will be useful, but this job will also fade when evolved chatbots replace them. People have to be prepared for this and governments play a fundamental role there.
- Good open eGovernment services for general practice health can contribute to increase citizens and businesses trust in:
 - eGovernment services, i.e. secure services.
 - Government itself, i.e. open government that is accountable and transparent.
- By addressing such an important aspect as health, open eGovernment services for general practice health can help to improve the quality of life in general.
- The development of open eGovernment services for general practice health should not contribute to increase the digital divide within a country and among countries.

3.6 RECOMMENDATIONS

a) Increase in use and further development of eDemocracy tools

General practice health is a field public administrations can use to engage users' participation. For instance, citizens and practitioners' opinions can be very important when deciding on a new general practice health centre because they will be the ones benefiting (or not) from it. This participation can help governments to decide and citizens and practitioners to increase their trust in the public sector.

b) User-centered design

In order to create valuable and useful open eGovernment services for the general practice health sector, developers have to attend the needs and expectations of all stakeholders. Articulating these expectations requires service designers not only to analyse and envision the way the service will be used, but also to validate their assumptions.

This requires training of developers in emerging user-centered design methodologies and tools.

c) Service personalization

Both citizens and practitioners would benefit from personalised open eGovernment services. Where citizens are involved, these services could be proactive and, for instance, advise a person to get a check-up when they are over certain age.

d) Universal accessibility of services

If considerations for universal accessibility services are fundamental for other open eGovernment services, they are even more important when health is involved. Moreover, many people with accessibility issues need health services on a more frequent basis than the average citizen.

e) Services in multiple languages

Again, when health is involved, being able to understand the service itself and to use it in one's native language is critical.

The lack of this option in general practice services does not only hinder access to services by non-native speakers, but can also have severe public health consequences.

f) Ubiquitous services (computers, mobiles, tablets)

As mobiles are fast becoming the main device through which people access the internet, it is imperative that more services are provided through mobile friendly websites or apps that would open access to a greater number of citizens.

g) Meeting the once-only principle

Interoperability and eIdentification are the two main pre-conditions so that users only have to supply the same information once.

The use of open source software, open standards and open API will result in more open and scalable ICT systems for public service delivery. This will pave the way for the interoperability (and integration) of open eGovernment services for general practice health.

The existence of specific identifications for health services in many Member States can, on the one hand, facilitate the once-only principle in general practice services in those countries, but, on the other hand, make it more difficult for other open eGovernment services in those countries and across borders. More research and development is needed regarding this issue.

h) Openness

Data and algorithms transparency is essential for digital trust of eGovernment services for the general practice health sector. Public administrators and other stakeholders have to be especially careful when dealing with health data, the use and processing of these data have to be clearly stated, consent has to be specifically asked for and data have to be anonymised when provided to others.

i) Cybersecurity

Public administrations should provide general practice services that ensure stakeholders that they are interacting with the intended counterpart. Health data should be stored in such a way that only authorised entities can access them and they can be recovered after a security incident.

More research for the development of cybersecurity tools and technologies is needed in order to improve existing solutions and to answer the challenges that new and emerging technologies (e.g., cloud and IoT) pose.

4 NEXT STEPS FOR OPEN EGOVERNMENT SERVICES RELATED TO LOCAL GOVERNMENT

4.1 OPEN EGOVERNMENT IN LOCAL GOVERNMENT SERVICES

Open Government is a government with high levels of transparency with an emphasis on government accountability, meaning that the public should have access to government-held information and be informed of government proceedings. It includes expectations for increased participation and collaboration of citizens, businesses, employees and other entities in government proceedings, through the use of modern, open technologies⁶. *Government 2.0* refers to government itself as an open platform⁷ that allows people inside and outside government to innovate and that evolves through interactions between the technology provider and its user community. *eGovernment* refers to the use of computers and other devices to provide information and services to the public. *eGovernance* extends the scope of eGovernment to include citizen engagement and participation in governance⁸.

In this document we are focused on Open eGovernment services that are aimed for local government. Local government institutions vary greatly between countries, However there is a general consensus about the fact that local government is the public administration that is the closest to citizens, in contrast to state (or even supranational) level governments. In some countries, local authorities have more autonomy and relatively independent economy where they can partly decide their agenda on their projects and budget. In some countries, a central government decides the most⁹.

“If governments are to fully exploit the benefits that can come from mature eGovernment implementations, then local government electronic service delivery must be seen as a vital component.”¹⁰

4.2 SOME AVAILABLE AND EMERGING SOLUTIONS

In this section we present several solutions that have been already proposed in this area. These solutions go in the direction of providing improved open eGovernment services by using emerging technologies.

Simplification of administrative procedures for citizens of local governments

⁶ <https://opensource.com/resources/open-government>

⁷ <https://techcrunch.com/2009/09/04/gov-20-its-all-about-the-platform/>

⁸ https://en.wikipedia.org/wiki/E-government#Comparison_with_e-governance

⁹ Tom Demeyer et al. (2016). Clarity Project Deliverable D2.2: Preliminary needs analysis for the up-take of eGovernment services in Europe.

¹⁰ Peter Shackleton, Julie Fisher & Linda Dawson (2004) Internal and External Factors Impacting on E-Government Maturity: A Local Government Case Study, *Journal of Information Technology Case and Application Research*, 6(4): 36-50, DOI: 10.1080/15228053.2004.10856053

- Single notification service. A convenient way for citizens to communicate and check online their notifications to a number of Public Administrations through a single notification service, this can be also done cross-border. This service requires a digital certificate and an eID. A notification can be for example a change of address.
- Examples: Spain, Estonia, Sweden, Slovenia, Italy, the Netherlands and Portugal accept certificates and notifications from citizens of their country and from other EU countries as well.
- Mobile services. Some Member States provide mobile eGovernment services.

Examples: Skellefteå municipality's award winning mobile application (Android, iPhone) "Mitt Skellefteå" (My Skellefteå) is a platform containing a number of local government services. The services contained in the platform can be personalized by the specific user.

- Blockchain technologies allow for decentralised secure and agreed applications for local governments. They can be used in the development of authentication tools and services that give collective governance in a citizen-friendly and privacy-aware fashion. Other applications include monitoring intellectual property contributions in cooperative work and reward schemes for citizen participation.
- Personalization of portals and services which are adaptive to the user profile and requirements.

Examples: The Netherlands eGovernment portal¹¹ provides access by the user to a personalized environment adapted to his preferences and needs.

- Once-only submission of data.

Examples: In Zaragoza, Spain, the service catalogue in the eGovernment portal¹² has a "My folder" option that can be accessed with the usage of a digital certificate, where some services can be requested which are connected to usual systems for the provision of once only submission of data.

- Machine Learning applications. Techniques to provide automated answers to eGovernment service users. Deep Learning for database NLP query interface and for management of user records to enable the once-only principle.
- Applications that deploy the performance of government services.

¹¹ <https://www.overheid.nl/english>

¹² <https://www.zaragoza.es/ciudad/ayto/>

Examples: In the United Kingdom there is a platform that presents performance of government services: cost per transaction, user satisfaction, digital take-up and completion rate.

eIdentification

- Unique electronic identification, eId. Unique identification used in public eGovernment services and in private services like banks, supermarkets, etc. This is related to the once-only principle where with a unique id it is more feasible to develop services that use the data and documents already introduced by the user.

Open source solutions which allow third parties to provide eGovernment services to Local Governments

- Open Data. Publishing open data as linked data facilitates the connection of different information sources, and gives rise to new and innovative applications that improve the search and relevance of retrieve information. Technologies for open data provision have been released with the aim of being replicated in different municipalities.

Examples: Several open data portals such as Spain's open data government portal¹³ have published their data and provide a service to query the data.

- Open source content management tools for local government's websites. Software systems that provide government website authoring, collaboration, and administration tools designed to allow users to create and manage website content with relative ease.

Examples: Estonia's Rural Municipality Portal¹⁴ based on an open source content management tool, which allows for easy and uniform site administration, it includes a standard website structure for local governments, tools for site administration and built-in interfacing with public registers.

eDemocracy

- eDemocracy and eParticipation applications where it is possible for citizens to participate in council meetings, and make their own proposals to start an initiative or a referendum. Citizens can make complaints and suggestions or request new services as well. Also, it is possible to participate through social media platforms.

Examples: The eDemocracy portal in Finland¹⁵ is a portal that gathers together information from various democracy-related sites and news in the field of political decision-making.

¹³ <http://datos.gob.es/>

¹⁴ <https://www.kovtp.ee/>

¹⁵ [Demokratia.fi](http://demokratia.fi)

The site thereby makes it easier for citizens to find the best channels for participation and influence, and increases government transparency and interaction.

- Discussion management and vote management tools that are relevant for eDemocracy and eParticipation.

Examples: these types of tools have been the basis for the Participatory Budgets programs in Zaragoza, Spain¹⁶. Another example is the d-cent tools¹⁷ that enable citizens decide and vote on solutions and collective municipal budgeting; and finally implement and reward people with blockchain reward schemes.

- Applications for accountability that present information on where money is spent and how well public services are performing. Not only does this let people hold government to account, but it can also help to improve efficiency, give people choice in using public services and contribute to economic growth.

4.3 SOME AVAILABLE AND EMERGING BUSINESS AND DATA MODELS

- Open government Co-creation: “government and businesses initiate, design, or implement programs, projects, or activities together”. This includes the design and development of eGovernment services and the provision of co-creation spaces where SMEs and self-employed can be involved in this process.
- Spaces for citizens to foster community interaction and collaborative work.
- Assistance to citizens for access and use of open eGovernment services such as in person attention and call centres.
- Personnel that provide support to eGovernment portals in some tasks: online chats regarding questions and advice, management of forums, answer of emails, assistance in compliance to laws, directives, regulations, etc. on Open government, and eGovernment, community management of the portal.
- Public administrations open their data and services to other public administrations, and to businesses and civil society. Non-aggregated data are opened for SMEs and self-employed who may access this data to develop eGovernment applications and tools.
- User-centered design methods, e.g. service design and design sprints.
- eGovernment services developed by third parties.

4.4 GAPS: POLICY, TECHNOLOGY AND DATA

Policy

¹⁶ <https://www.zaragoza.es/sede/servicio/presupuestos-participativos/>

¹⁷ <https://dcentproject.eu>

- Only a small portion of local governments have developed their own strategies for eGovernment and open-government.
- Digital training for public servants is not generally addressed by local governments.
- Need for implementation of EU directives and policies

Technology and Data

- Low technology skills of staff in local governments.
- Unavailability of mobile applications and responsive websites.
- Low usability in some portals that would benefit from the availability of interfaces in the user's natural language.
- Insecure vote management and discussion management for eDemocracy.
- Lack of use of methods of user-centered design and co-creation
- Need to adapt data storage and manipulation to GDPR
- Unavailability of detailed Open Data that is homogeneous across public administrations

4.5 SOCIAL CONSIDERATIONS

There are a number of social considerations related to open eGovernment services in the local government sector:

- Continuous changes in the labor force that will be seen in local governments needing less and less employees to fill out forms, and in how new jobs such as forum moderators will ultimately be replaced by artificial intelligence systems
- Increasing citizens and businesses trust in:
 - i. eGovernment services, e.g. secure services.
 - ii. Government, e.g. open government that is accountable and transparent.
- Better, more efficient, effective and quality delivery of public services.
- Transformation of the public sector itself, which will cater for the needs of public sector employees and policy makers, as well as citizens and businesses.
- Governments in general and local ones in particular not only enabling the use of innovative solutions but also playing an active role in applying them.
- Contribution to reduce (or at least, not to increase), the digital divide within a country and among countries.
- Governments in general and local ones in particular as drivers of an inclusive society.
- Improvement of quality of life in general.

4.6 RECOMMENDATIONS

a) Increase in use and further development of eDemocracy tools

Not only must local governments provide effective service but arguably a more important objective is to engage and foster communities in the everyday decision making process of government at this level¹⁸.

As the closest administration to citizens and business, local government decisions, such as neighborhood planning and local taxes, can greatly affect their daily life and work. Thus, they are likely to want to take part in local-government decision-making processes. This participation can help local governments to decide and citizens and business to increase their trust in the public sector.

Local authorities should take into account a number of success factors for eParticipation projects, including strong government support (with a commitment to act on input received); a user-friendly interface; the use of different channels of communication (offline as well as online); appropriate security and privacy provisions (ranging from anonymous responses to fully identified participants); and a political issue that can be addressed in a way understandable by non-experts¹⁹.

Local governments should provide features such as web forums, discussion spaces and social media interaction and make sure that the input is transparently processed.

Since participation is not a commonly offered service, new job positions may be needed. Analysis of staff (re-)allocation and (re-)training should be carried out.

b) User-centered design

As open-eGovernment-service providers, local governments should incorporate user-centered design to their services, whether they develop them or they contract others to develop them.

eParticipation can be used as a means to assess existing services, to learn of citizens and businesses' needs and to co-create new ones.

c) Service personalization

¹⁸ Peter Shackleton, Julie Fisher & Linda Dawson (2004) Internal and External Factors Impacting on E-Government Maturity: A Local Government Case Study, *Journal of Information Technology Case and Application Research*, 6(4): 36-50, DOI: 10.1080/15228053.2004.10856053

¹⁹ Ron Davies (2015). eGovernment Using technology to improve public services and democratic participation. European Parliamentary Research Service

Users would benefit from a personalised portal where open eGovernment services are provided according to their profile and which they can customise according to their needs and liking. Local governments should not forget this when developing their electronic services.

d) Universal accessibility of services

Universal accessibility is a fundamental requirement for the success of any eGovernment. In contrast to the private sector, which can be exclusionary by reaching only target market segments. Public administrations should design open eGovernment services that are inclusive by default and cater to the needs of people with disabilities. Local governments are not an exception to this and should not wait to make their services available even to those who are either unwilling or unable to get online, while keeping in-person services as well.

e) Services in multiple languages

A great majority of eGovernment web portals in the EU are available only in the native language or in the native language and English; the English version often only provides information and not all of the eGovernment services that are provided in the native language.

Local governments should provide not only information in the native language of the user, but also fully multilingual open eGovernment services, so that non-native speakers are catered for.

f) Ubiquitous services (computers, mobiles, tablets)

As mobiles are fast becoming the main device through which people access the internet, it is imperative local governments provide open eGovernment services through mobile friendly websites and apps.

g) Meeting the once-only principle

Local governments should focus on interoperability as a precondition to the once-only principle.

The use of open source software, open standards and open API will result in more open and scalable ICT systems for public service delivery. This will pave the way for the integration of systems and the implementation of the once-only principle for citizens and businesses.

h) People's access to their own data

Allowing citizens to “own”, use and amend their data could go a long way to make them more invested in the services they use and more trusting of government; additionally it would cut down on information queries by governments and allow for faster resolution times.

It is important for local governments to understand how people think about their data in relation to public services and how they would like to interact with it. Local governments should make

the citizens and businesses' data that they have available to their owners, so that they can manage, use and amend them.

i) Openness

The availability of the data held by local governments in an open, appropriate and according-to-law way and the provision of information on how these data are processed should be central for local governments if they want to cater for transparency and accountability. This will also allow the development of new solutions by businesses and the public administration itself.

j) eProcurement services

Providing eProcurement, eTender and eInvoicing services is very important to level the playing field and ease access for all businesses to the information and thus develop the potential for bidding for public contracts procurement opportunities and tenders.

Local governments should focus on setting up eProcurement and eTender services that are easily accessible for businesses of all sizes and that citizens can look up in order to monitorise the bidding process.

k) Cybersecurity

Security plays a key role in the provision and take-up of open eGovernment services. People will not trust and consequently use open eGovernment services if they are not convinced their data are protected and the applications are reliable and available when required. Local governments should provide a means so that both the user and the administration can be sure that they are interacting with the intended counterpart. Data should be stored in such a way that only authorised entities can access them and they can be recovered after a security incident.

l) Staff (re)training

Local governments should take steps to increase the digital skills among their public servants as a necessary precondition to any successful provision and use of open eGovernment services.

5 NEXT STEPS FOR OPEN EGOVERNMENT SERVICES RELATED TO SMALL BUSINESS AND SELF-EMPLOYED

5.1 OPEN EGOVERNMENT IN SMALL BUSINESS AND SELF-EMPLOYED

Open Government is a government with high levels of transparency with an emphasis on government accountability, meaning that the public should have access to government-held information and be informed of government proceedings. It includes expectations for increased participation and collaboration of citizens, businesses, employees and other entities in government proceedings, through the use of modern, open technologies²⁰. *Government 2.0* refers to government itself as an open platform²¹ that allows people inside and outside government to innovate and that evolves through interactions between the technology provider and its user community. *eGovernment* refers to the use of computers and other devices to provide information and services to the public. *eGovernance* extends the scope of eGovernment to include citizen engagement and participation in governance²².

Open Government for SMEs and self-employed is designed to enable the use of open and shared government data to solve business problems, design new products and services, and drive innovation within their business models²³.

In this document we are focused on Open eGovernment services that are aimed for SMEs and Self-employed citizens. This group is varied and ranges from single person initiatives up to SMEs with at most 250 employees, and may belong to different sectors:

- Specifically, an SME according to the EU definition given by the Commission Recommendation 2003/361/EC, should employ less than 250 employees and have an annual turnover of not more than €50 million or an annual balance-sheet total of not more than €43 million.
- A self-employed person is defined by Eurostat as “the sole or joint owner of the unincorporated enterprise in which he/she works Self-employed people also include: unpaid family workers; outworkers (who work outside the usual workplace, such as at home); and workers engaged in production done entirely for their own final use or own capital formation, either individually or collectively“.

So far, some key government services in this area have focused on reducing the administrative burden and shortening response times so that enterprises can be set up and run effectively. This has been done under the assumption that taking into consideration the size of SMEs, what they

²⁰ <https://opensource.com/resources/open-government>

²¹ <https://techcrunch.com/2009/09/04/gov-20-its-all-about-the-platform/>

²² https://en.wikipedia.org/wiki/E-government#Comparison_with_e-governance

²³ <http://govlabacademy.org/static/files/sme-project-clinic.pdf>

struggle with is the strength of expertise they have on board and the limited resources they may have to dedicate to administrative and legal work that is required to set up and run a business.

Furthermore, in the EU context, government services should also take into account the requirement of cross-border solutions in the context of the European Single Market, where an enterprise from one member state may want to setup run, and trade in another member state.

Open eGovernment services and information on different aspects like health and safety, building, environmental regulation, labour law, VAT regulation, and company law, should be available in a one-stop portal. Following the Single Digital Gateway proposal, the portal should provide online procedures, related information, and also assistance and problem solving services. Additionally, once-only document submission should be provided.

5.2 SOME AVAILABLE AND EMERGING SOLUTIONS

In this section we present several solutions that have been already proposed in this area. These solutions go in the direction of providing improved eGovernment services for SMEs and self-employed, using emerging technologies.

Simplification of administrative procedures for SMEs and self-employed

- Mobile services. Especially due to their limited resources, SMEs and self-employed can benefit from having services deployed in their mobile devices.

Examples: “My Skellefteå” mobile app provides several eGovernment services for their citizens.

- Blockchain technologies allow for decentralised secure and agreed applications for SMEs and self-employed. They can be used in the development of authentication tools and services that give collective governance in a citizen-friendly and privacy-aware fashion. Other applications include monitoring intellectual property contributions in cooperative work and smart contracts.
- Ontology-described services. Services annotated with semantic technologies to improve search capabilities

Examples: the business portal in Finland²⁴ is a multi-facet search portal for finding relevant commodities, information and services by using ontologies.

²⁴ <https://yrityssuomi.fi/en/>

- Automatic workflows in eGovernment portals. Automatic workflows for relevant procedures could guide business through the steps involved in creating and maintaining the businesses.

Examples: Croatia's eGovernment portal²⁵ offers a number of transverse workflows which are customised in a way that the flow automatically finds the forms that are relevant to each individual user and may work on top of a workflow engine, meaning that forms can be collected and then distributed within Government offices, tracking progress and informing the applicant accordingly.

- Personalization of portals. Personalization of portals and services that are adaptive to the user profile and requirements.

Examples: Italy's eGovernment portal for businesses²⁶ provides personalised access to a virtual desk of "integrated services" i.e. services provided by different authorities but relating to a unique goal for the user.

- Machine Learning applications. Techniques to provide automated answers to eGovernment service users. Deep Learning for database NLP query interface and for management of user records to enable the once-only principle.

Better and more transparent eProcurement

- eProcurement platforms based on open European standards and EC directives, that automatically find the forms that are relevant to each individual user with information on eProcurement opportunities and procedures, and access to digital eProcurement services.

Examples: Belgian eTenders portal²⁷ that is deployed together with an eNotification platform to alert on eProcurement opportunities. The TED portal (Tenders Electronic Daily)²⁸ is dedicated to European public procurement: contracts, according to the EU rules on public procurements, notices published in EU Member States, European Economic Area (EEA) and beyond. The user can browse, search and sort procurement notices by country, region, business sector and more

eIdentification

- Unique electronic identification, eId. Unique identification used in public eGovernment services and in private services like banks, supermarkets, etc. This is related to the once-

²⁵ <http://www.hitro.hr/Default.aspx?sec=18>

²⁶ <http://www.impresainungiorno.gov.it/psc-italy>

²⁷ <https://eten.publicprocurement.be/etendering/home.do>

²⁸ <http://ted.europa.eu/TED/main/HomePage.do>

only principle where with a unique id it is more feasible to develop services that use the data and documents already introduced by the user.

Open source solutions which allow SMEs and self-employed to provide eGovernment services as well

- **Linked and Open Data.** Publishing open data as linked data facilitates the connection of different information sources, and gives rise to new and innovative applications that improve the search and relevance of retrieve information.

Examples: Several open data portals such as Spain’s open data government portal²⁹ have published their data as Linked Data and provide a service to query the data.

- **IoT applications.** IoT can improve goods and services of SMEs. Almost any object can be transformed into a “smart” object, and the customer base for these enhanced products is expanding rapidly.
- **Open source content management tools for local government’s websites.** Software systems that provide government website authoring, collaboration, and administration tools designed to allow users to create and manage website content with relative ease.

Examples: Estonia’s Rural Municipality Portal³⁰ based on an open source content management tool, which allows for easy and uniform site administration, it includes a standard website structure for local governments, tools for site administration and built-in interfacing with public registers.

- Use of open source tools and services by SMEs and self-employed.

5.3 SOME AVAILABLE AND EMERGING BUSINESS AND DATA MODELS

- **Open government Co-creation:** “government and businesses initiate, design, or implement programs, projects, or activities together”. This includes the design and development of eGovernment services and the provision of co-creation spaces where SMEs and self-employed can be involved in this process.
- **Spaces for SMEs and self-employed to foster community interaction and collaborative work.**

Examples: The Zaragoza “La Colaboradora” option in Zaragoza Activa³¹ provides a physical collaboration space where entrepreneurs may develop projects in a collaborative fashion.

²⁹ <http://datos.gob.es/>

³⁰ <https://www.kovtp.ee/>

³¹ <https://www.zaragoza.es/ciudad/sectores/activa/lacolaboradora/>

- Assistance to businesses for access and use of open eGovernment services such as in person attention and call centres.
- Personnel that provide support to eGovernment portals in some tasks: online chats regarding questions and advice, management of forums, answer of emails, assistance in compliance to laws, directives, regulations, etc. on Open government and eGovernment, community management of the portal.
- Public administrations open their data and services to other public administrations, and to businesses and civil society. Non-aggregated data are opened for SMEs and self-employed who may access this data to develop eGovernment applications and tools.
- Reuse of eGovernment services by private companies.

Examples: Sweden's authentication ebank id service is used for login into the medical assistance website³², which was developed by a startup company.

- Platform-based business models. SMEs and self-employed can be participants in ecosystems of digital partners.
- Consulting services by SEMs on technology roadmaps to governments, especially at local level, in order to enable eGovernment.

5.4 GAPS: POLICY, TECHNOLOGY AND DATA

Policy.

- Although some countries include digital training for public servants and citizens, there is no policy regarding the public training in technology skills for staff in SMEs and self-employed.
- Although some countries include user-centric principles for public servants as well as citizens, in the design of services, there is no policy regarding user-centric design for services for SMEs and self-employed.
- Some Member States include eGovernment strategies for the federal governments and only a portion of local governments have developed their own strategies.
- Without eIdentification, businesses and self-employed would only have access to a very limited number of open eGovernment services, they would not be able to access their data and they would have to submit their data every time they wanted to use a service. The eIDAS Regulation does not impose a particular eID on all Member States, they have their own eIdentification rules and procedures. SMEs and self-employed would benefit from the use of the eID not only at a national level, but also to access public services across borders in other Member States

³² <http://kry.se>

- With respect to cybersecurity, the NIS directive has not been implemented in all of the Member States. On the whole, there is not much emphasis on national cybersecurity strategies
- The EU has decided to undertake a thorough rethinking of the public procurement process with procurement digitalisation. This goes beyond simply moving to electronic tools; it rethinks various pre-award and post-award phases with the aim to make them simpler for businesses to participate in and for the public sector to manage. It also allows for the integration of data-based approaches at various stages of the procurement process.
- For eProcurement, by April 2016 (transposition date for the Directives 2014/23/EU, 2014/24/EU and 2014/25/EU), tender opportunities and tender documents had to be electronically available. However, some of the Member States were late in implementing them and only did so weeks or months after the deadline. By October 2018 electronic submission should be made mandatory for all contracting authorities and all procurement procedures.
- By November 2018, Member States must ensure that all public sector contracting authorities are able to receive and process electronic invoices from suppliers which follow the new European standard for eInvoicing. This may be a challenge for SMEs and self-employed if they are not prepared for this standard.

Technology and Data.

- Low development of eGovernment services for self-employed (more for SMEs).
- Low technology skills of staff in SMEs and self-employed.
- Unavailability of mobile applications.
- Low integration of eGovernment services for SMEs and self-employed.
- eProcurement applications require, in general, that users input all the documentation each time they bid.
- Development of eProcurement for opportunities, is a niche in the sector of development of digital services.
- Low usability in some portals that would benefit from the availability of interfaces in the user's natural language.
- There are eGovernment services that are used by small businesses, but there is a lack of services that help small businesses. The diversity of small businesses make this development difficult.
- Availability of detailed Open Data that is homogeneous across public administrations that would enable rapid growth and more competitive businesses.

5.5 SOCIAL CONSIDERATIONS

- Clear definition of stakeholders for self-employed citizens.

- Stimulate entrepreneurship.
- Enable self-employment.
- Increase employment in SMEs.
- Contribute to reduce (or at least, not to increase), the digital gap/divide within a country and within countries. Digital service users are not evenly distributed maybe because of poor digital skills.
- Increase citizens and businesses trust in.
 - i. eGovernment services, i.e. secure services.
 - ii. Government, i.e. open government that is accountable and transparent.
- More equity between businesses regarding procurement.

5.6 RECOMMENDATIONS

a) User-centered design

Awareness of businesses expectations when interacting with the public sector through eGovernment services may facilitate the interaction between public administrations and users. These expectations are related to usability goals, user characteristics, tasks and workflow of the service.

Articulating these expectations requires service designers not only to analyse and envision the way the service will be used by businesses, but also to validate their assumptions. Emerging methodologies and tools for co-creation in general, and particularly for co-creation of services, give support to this action. Provision of co-creation spaces enables the use of these methodologies.

The uptake of user-centered design requires to train service staff in eService design, methodologies, and facilitation of user participation.

b) Service personalization

Personalization tailors a service to segments of individuals' needs. It is based on the knowledge of the group of users' profile and is used to improve user satisfaction.

Personalization may involve having a personal portal of customized eGovernment services according for example to age, IT skills or educational background of self-employed or of SME sector.

c) Universal accessibility of services

Considerations for universal accessibility services are related to alternatives for audio content, such as transcripts and captions, or sign language; page structure and content,

which need to be properly coded so that they can cater to text-to-speech synthesis or audio descriptions; and textual content that follows Easy-to-Read norms.

Accessibility options are often few and ill-locatable on government service web-portals. Public administrations should design digital public services that are inclusive by default and cater to the needs of people with disabilities. This is especially relevant for self-employed people with disabilities.

Several Member States have adopted measures based on internationally used guidelines, WCAG 2.0, for the design of accessible websites. However, those measures often relate to different versions or compliance levels of those guidelines. Due to these differences, developers' competitiveness and growth are hampered by the additional costs they would incur in the development and marketing of cross-border web accessibility-related products and services.

The approximation of measures at the national level to measures at the Union level should be based on agreed accessibility requirements for websites and mobile applications of public sector bodies. It would reduce uncertainty for developers and foster interoperability.

d) Services in multiple languages

A great majority of eGovernment web portals in the EU are available only in the native language or in the native language and English; the English version often only provides information and not all of the eGovernment services that are provided in the native language.

Language support should include not only the translation of website content but should also include the translation of forms and documents. This is under-developed and it is hindering access to services by non-native speakers. Such is the case services related to SMEs and self-employed users and is relevant for cross-border business development.

e) Ubiquitous services (computers, mobiles, tablets)

In general, there has been an increase in mobile “apps” but particularly only 1/3 of public sector websites are mobile-friendly in the EU. Additionally, some mobile apps for eGovernment services are provided in eGovernment portals in the EU, but in general there is a lack of mobile apps.

Lower-tech SMEs, would greatly benefit from low cost smartphone and mobile solutions.

As mobiles are fast becoming the main device through which people access the internet, it is imperative that more services are provided through mobile friendly websites or apps that would open access to a greater number of citizens.

f) Meeting the once-only principle

The once-only principle states that a user should not have to supply the same information more than once to public administrations. In order to meet this principle, eGovernment services need to be interoperable including across-borders interoperability. National administrations should take-up the European Interoperability Framework (EIF). eIDAS services, including eID and eSignature are also necessary in order to meet the principle.

The use of open source software, open standards and open API will result in more open and scalable ICT systems for public service delivery. This will pave the way for the integration of systems and the implementation of the once-only principle for businesses and self-employed.

Proposals to realize this step include the Single Digital Gateway, the interconnection of all Member States' business registers, the electronic interconnection of insolvency registers, the use of digital solutions throughout a company's lifecycle, the extension of the Single Electronic Mechanism for registration and payment of VAT, the single window for maritime transport, the Electronic Exchange of Social Security Information, the EURES European Job Mobility portal, cross-border eHealth services, and the exchange of electronic evidence between judicial authorities.

g) Openness

Public administration's open data that is machine-readable and that is capable of being shared and distributed allows the development of solutions that cater to the increasing demand for transparency, accountability, and responsiveness.

Data and algorithms transparency is essential for digital trust and appropriation of emerging technologies. An important shift deals with the control of data used and the intelligibility of algorithms, not only on the Internet but also on other connected services.

h) eProcurement services

Providing eProcurement, eTender and eInvoicing services is very important to level the playing field and ease access for all businesses to the information and thus develop the potential for bidding for public contracts procurement opportunities and tenders.

The transition of European Member States towards full e-procurement and use of contract registers is necessary.

The focus should be on setting up eProcurement and eTender portals that are easily accessible for businesses of all sizes. As with other eGovernment services, a user focused approach would be necessary to gauge both the interest and the usefulness of such portals and how they can be designed to ensure maximum take-up by businesses.

h) Cybersecurity

Security plays a key role in the provision and take-up of open eGovernment services. SMEs and self-employed will not trust and consequently use open eGovernment services if they are not convinced their data are protected and the applications are reliable, tamper-proof and available when required. Public administrations should provide a means so that both the user and the administration can be sure that they are interacting with the intended counterpart. Data should be stored in such a way that only authorised entities can access them and they can be recovered after a security incident.

More research for the development of cybersecurity tools and technologies is needed in order to improve existing solutions and to answer the challenges that new and emerging technologies (e.g., cloud and IoT) pose.

6 NEXT STEPS FOR OPEN EGOVERNMENT SERVICES RELATED TO DISABILITY

6.1 OPEN EGOVERNMENT IN DISABILITY

Open Government is a government with high levels of transparency with an emphasis on government accountability, meaning that the public should have access to government-held information and be informed of government proceedings. It includes expectations for increased participation and collaboration of citizens, businesses, employees and other entities in government proceedings, through the use of modern, open technologies³³. *Government 2.0* refers to government itself as an open platform³⁴ that allows people inside and outside government to innovate and that evolves through interactions between the technology provider and its user community. *eGovernment* refers to the use of computers and other devices to provide information and services to the public. *eGovernance* extends the scope of eGovernment to include citizen engagement and participation in governance³⁵.

Eurostat reports that in the EU there are 44 million people aged between 15 and 64 in the category of people with disabilities³⁶. The European Disability Strategy 2010-2020 states that social and economic participation of people with disabilities is vital³⁷. Open Government for people with disabilities is related to the design of services that use shared and open government data that are inclusive by default and cater to the needs of people with disabilities.

In this document we are focused on Open eGovernment services that are aimed for people with disabilities. This group is varied and ranges from people with physical disabilities e.g. visual or hearing loss or mobility impairment, to people with developmental disorders where many types of impairments are included like Intellectual Disabilities, Autism Spectrum Disorder (ASD), communication disorders, attention-deficit, among others.

Additionally, it is important to offer eGovernment services for the families of people with disabilities and for the staff that belong to the different support organizations for this population sector.

People with disabilities have a serious risk of social exclusion due to difficulties in their diagnosis, social ignorance, and lack of resources that offer adequate support. One of the main issues is employment. Although there are laws in some Member Countries that establish that public and private companies should employ workers with disabilities, many companies do not

³³ <https://opensource.com/resources/open-government>

³⁴ <https://techcrunch.com/2009/09/04/gov-20-its-all-about-the-platform/>

³⁵ https://en.wikipedia.org/wiki/E-government#Comparison_with_e-governance

³⁶ Eurostat, "Disability statistic – prevalence and demographics, 26 January 2016. http://ec.europa.eu/eurostat/statistics-explained/index.php/Disability_statistics_-_prevalence_and_demographics

³⁷ European Commission, "European Disability Strategy 2010-2020: A Renewed Commitment to a Barrier-Free Europe", COM (2010) 636 final, Brussels 15 November 2011. <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:0636:FIN:en:PDF>

comply with the law regarding the hiring of people with disabilities as there is very little knowledge on job profiles that are adequate for people with these impairments.

So far, accessibility options are often few and ill-locatable on government service web-portals. Several Member States have adopted measures based on internationally used guidelines, WCAG 2.0, for the design of accessible websites. However, those measures often relate to different versions or compliance levels of those guidelines. Having accessible Open eGovernment services would contribute to the support of people with disabilities and their integration into society.

Due to the differences among the compliance levels of accessibility guidelines, developers' competitiveness and growth are hampered by the additional costs they would incur in the development and marketing of cross-border web accessibility-related products and services. The approximation of measures at the national level to measures at the Union level should be based on agreed accessibility requirements for websites and mobile applications of public sector bodies. It would reduce uncertainty for developers and foster interoperability.

6.2 SOME AVAILABLE AND EMERGING SOLUTIONS

In this section we present several solutions that have been already proposed in this area. These solutions go in the direction of providing universally accesible eGovernment services using emerging technologies.

- Specialized website with information on important care and social security provisions for people with disabilities, chronic illnesses and the elderly. These are catered to the requirements of people with disabilities, their families and support staff.

Examples:

One-stop portal in the Netherlands³⁸ that provides information on important care and social security provisions for people with disabilities, chronic illnesses and the elderly.

Disability services in the different regions in Spain³⁹.

Gov.uk⁴⁰ one-stop eGovernment portal in the UK presents a wealth of information about disability services in one place, e.g. legal documents, links to advisory services and many services are available to disabled citizens through their account.

³⁸ <https://www.regelhulp.nl/>

³⁹ <http://www.mecd.gob.es/educacion-mecd/mc/convivencia-escolar/recursos/centros-atencion-diversidad.html>

⁴⁰ <https://www.gov.uk/browse/disabilities>

- eGovernment portals that follow standard recommendations for making Web content more accessible.

Examples: Zaragoza council eGovernment portal⁴¹ which complies with WCAG 2.0 norms. It is certified officially by the Spanish Agency for Normalization and Certification (AENOR).

Brazil portal for people with disabilities⁴².

- Portals for people with disabilities developed by third parties that follow standard recommendations for making Web content more accessible.

Examples: Discapnet⁴³ is a portal for people with disabilities in Spain that follows WCAG accessibility guidelines. In its design, the emphasis has been put on universal accessibility. Discapnet was built by the Foundation ONCE and an ICT company. While it is non-governmental, it has been developed in collaboration with government agencies. The portal publishes employment boards and employment policies that aim to support the insertion of people with disabilities in the job market.

- Disability helpline for any claim relating to disability benefits.

Examples: UK disability benefits helpline⁴⁴.

- Mobile applications that support people with disabilities, especially in mobility issues.

Examples: Mobile app for mobility in the Metro of Madrid for people with visual impairment⁴⁵.

6.3 SOME AVAILABLE AND EMERGING BUSINESS AND DATA MODELS

- Co-creation of portals for people with disabilities: “government and people with disabilities, families and support staff initiate, design, or implement programs, projects, or activities together”. This includes the design and development of accessible eGovernment services and the provision of co-creation spaces where people with disabilities, families and support staff can be involved in this process; especially important is having a validation stage with participation of people with disabilities.
- Assistance to people with disabilities, their families and support staff for the access and use of open eGovernment services such as in person attention and call centres.

⁴¹ <http://www.zaragoza.es/sede/electronica/>

⁴² <http://www.servicos.gov.br/area-de-interesse/assistencia-ao-portador-de-deficiencia>

⁴³ Discapnet, no date. <http://www.discalpnet.es/Castellano/Paginas/default.aspx>

⁴⁴ <https://www.gov.uk/disability-benefits-helpline>

⁴⁵ <http://metrociego.com/>

- Personnel that provide support to eGovernment portals related to accesibility, in some tasks: online chats regarding questions and advice, management of forums, answer of emails, assistance in compliance to laws, directives, regulations, etc. on open government and eGovernment, community management of the portal.
- Self-employment profiles and business models that cater to people with disabilities.
- Reuse of eGovernment accesible services by private companies. For example, a biometric id service developed for a specific website could be reused for login by an eGovernment service.
- Platform-based business models. People with disabilities can be participants in ecosystems of digital partners.

6.4 GAPS: POLICY, TECHNOLOGY AND DATA

Policy

- Despite the existence of numerous legislative imperatives and societal obligations to promote inclusion and full citizenship of people who have disabilities, these do not appear to have manifested in real attitudinal change or in action based work to promote access to ICT, including the Internet, for people with disabilities. Universal design is not apparent in the vast majority of eGovernment portals. and although legal penalties are aimed to promote compliance, implementation of such penalties is lacking
- Although some countries include digital training for public servants and citizens, there is no policy regarding the public training in technology skills for people with disabilities, their family and support staff.
- Although some countries include user-centric principles for public servants as well as citizens, in the design of services, there is no policy regarding user-centric design for services for people who have disabilities, their family and support staff.
- With respect to eIdentification, the eIDAS Regulation requires that people with disabilities are “able to use trust services and end-user products used in the provision of those services on an equal basis with other consumers”. There is no specific policy on the type of eID services that people with disabilities require.
- The ‘Users’ Rights’ Directive⁴⁶ makes numerous references to the right to ‘equivalent access’ (including choice and affordability) of disabled end-users to services available to other end end-users. This functional equivalence implies the same usability of services by all users, even if the means to achieve this are different for disabled end-users. Equivalence of access should be guaranteed by national consumer protection requirements. The

⁴⁶ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:337:0011:0036:En:PDF>

Directive encourages use of European standards to achieve e-accessibility of services (including through public procurement procedures).

- In October 2016 the Web Accessibility Directive⁴⁷, which regulates accessibility of public sector websites and mobile applications, was formally adopted. The Directive agreed text reportedly covers websites and mobile applications of public sector bodies with a limited number of exceptions (e.g. broadcasters, livestreaming), refers to the standards to make websites and mobile applications more accessible and requires regular monitoring and reporting of public sector websites and mobile apps by Member States. In December 2015, the Commission published a proposal for a Directive⁴⁸ on accessibility requirements for products and services (also known as the European Accessibility Act), which includes provisions addressing web accessibility relating to the private sector. The proposal is currently under discussion.
- Member States have until 23rd September 2018 to transpose the Web Accessibility Act into their national legislation. Although the Directive does not apply to EU institutions' websites and mobile applications, those institutions are encouraged to comply with the Directive's accessibility requirements. The European Commission are committed to leading by example for Web accessibility and have announced they will adopt implementing acts by the end of 2018⁴⁹. Since January 2010, all new EUROPA websites have been created in compliance with the World Wide Web Consortium standard WCAG 2.0, level AA. Additionally, the Information Providers Guide⁵⁰ details the accessibility requirements that everyone who develops and publishes material for EUROPA websites has to conform with.
- Disability is clearly affected by eAccessibility policies. In spite that some Member States (e.g., the Netherlands) do not have specific eAccessibility laws, all the reviewed Member States and the EU are committed to website and mobile-app accessibility and include this in their eGovernment strategies. Another item in these strategies, which is especially important for this sector, is citizen-centered design, since customizable applications and personalised service provision is an imperative for people with disabilities. Perhaps due to lack of digital skills more prominent in this group, ICT Education policies are particularly relevant here.

Technology and Data

- Some website material is in general compliant with the WCAG 2.0 accessibility standard while services in general are lacking in accessibility. Although some countries have services for people with disabilities, there is a quite large number that do not have accessible services as part of their eGovernance service portfolio (e.g., France, Germany, Greece,

⁴⁷ DIRECTIVE (EU) 2016/2102 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 26 October 2016 on the accessibility of the websites and mobile applications of public sector bodies http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2016.327.01.0001.01.ENG&toc=OJ:L:2016:327:TOC

⁴⁸ <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2015:0615:FIN>

⁴⁹ <https://ec.europa.eu/digital-single-market/en/web-accessibility>

⁵⁰ http://ec.europa.eu/ipg/standards/accessibility/index_en.htm

Hungary, Ireland, Latvia, Lithuania, Luxemburg, Malta, Poland, Portugal, Romania, and Slovakia).

- Accessibility options are often few and difficult to locate on government service web-portals. Accessibility options are often hidden at the bottom of web pages and it is not very clear how to use them. Many disabled people may have their own software and hardware to assist with accessibility, nevertheless these users require that eGovernment websites are compliant with accessibility norms and need assistance in using these websites and services.
- Availability of alternative access security mechanism such as biometric identification for users with disabilities. These users, their families and support staff should be trained in the use of these systems.
- Services are not available on dedicated one-stop-shop portals. As these services are provided by a mixture of national and local/regional governments, disabled citizens need to visit different portals/websites to access different services. In most cases, financial services (e.g. benefits) are accessed through the national government portals, while care, transport and accessibility assistance is provided through local government web portals.
- Lack of services that aim to boost inclusivity and civic participation of disabled people (e.g., work, training and education).
- Low technology skills for staff that belongs to support institutions for people with disabilities.
- Little availability of mobile applications, especially important for people with disabilities that have mobility problems.

6.5 SOCIAL CONSIDERATIONS

Open eGovernment services should:

- Enable insertion in the job market of people with disabilities.
- Enable self-employment for the disabled.
- Facilitate the services provided by organizations that give support to people with disabilities
- Provide equivalent access to people with disabilities with respect to other consumers of these services.

6.6 RECOMMENDATIONS

a) Increase in use and further development of eDemocracy tools

In general eDemocracy and eParticipation tools are not offered as services on eGovernment portals in the EU. eGovernment websites need to be transformed in order to support increasing engagement and participation of citizens and businesses, providing features such as web forums, discussion spaces and social media interaction. Specifically, there is a lack

of technological solutions that aim to boost inclusivity and civic participation of people that have disabilities on foundational issues, such as work, training and education.

b) User-centered design

User-centered design is necessary for accessible eGovernment services, since customizable applications and personalised service provision is an imperative for people with disabilities.

Awareness of users with disabilities, families and support staff expectations when interacting with the public sector through eGovernment services, may facilitate the interaction between public administrations and users. These expectations are related to usability goals, user characteristics, tasks and workflow of the service.

Articulating these expectations requires service designers not only to analyse and envision the way the service will be used by these users, but also to validate their assumptions. Emerging methodologies and tools for co-creation in general, and particularly for co-creation of services, give support to this action. Provision of co-creation spaces enables the use of these methodologies.

The uptake of user-centered design requires to train service staff in eService design, methodologies, and facilitation of user participation.

c) Service personalization

There is a need for personalised service provision. In addition, due to the great complexity arising from combinations of conditions encountered from person to person, the need for customizable applications and personalised service provision is an imperative for persons with disabilities.

Personalization tailors a service to segments of individual's needs. It is based on the knowledge of the group of users' profile and is used to improve user satisfaction.

Personalization may involve having a personal portal of customized eGovernment services according, for example, to type of disability.

d) Universal accessibility of services (eAccessibility)

Considerations for universal accessibility services are related to alternatives for audio content, such as transcripts and captions, or sign language; page structure and content, which need to be properly coded so that they can cater to text-to-speech synthesis or audio descriptions; and textual content that follows Easy-to-Read norms.

Accessibility options are often few and ill-locatable on government service web-portals. Public administrations should design digital public services that are inclusive by default and cater to the needs of people with disabilities.

Several Member States have adopted measures based on internationally used guidelines, WCAG 2.0, for the design of accessible websites. However, those measures often relate to different versions or compliance levels of those guidelines. Due to these differences, developers' competitiveness and growth are hampered by the additional costs they would incur in the development and marketing of cross-border web accessibility-related products and services.

Bearing in mind that with demographic change more citizens will experience disability in their lifetime, we suggest that it would be of benefit if governments set up one stop web portals for disabled citizens, set up in a similar way to the business portals that most of the European member states have set up.

e) Ubiquitous services (computers, mobiles, tablets)

In general, there has been an increase in mobile “apps” but particularly only 1/3 of public sector websites are mobile-friendly in the EU. Additionally, some mobile apps for eGovernment services are provided in eGovernment portals in the EU, but in general there is a lack of mobile apps.

People with disabilities that have issues with mobility, e.g. people with visual impairment, would greatly benefit from low cost smartphone and mobile solutions.

As mobiles are fast becoming the main device through which people access the internet, it is imperative that more accessible services are provided through mobile friendly websites or apps that would open access to a greater number of citizens.

f) Meeting the once-only principle

The once-only principle states that a user should not have to supply the same information more than once to public administrations. In order to meet this principle, eGovernment services need to be interoperable including across-borders interoperability. National administrations should take-up the European Interoperability Framework (EIF). eIDAS services, including eID and eSignature are also necessary in order to meet the principle. In particular people with disabilities should be provided with biometric id systems that allow identification without the use of pin numbers.

The use of open source software, open standards and open API will result in more open and scalable ICT systems for public service delivery. This will pave the way for the integration of systems and the implementation of the once-only principle for businesses and self-employed.

g) Openness

Public administration's open data that is machine-readable and that is capable of being shared and distributed allows the development of solutions that cater to the increasing demand for transparency, accountability, and responsiveness.

Data and algorithms transparency is essential for digital trust and appropriation of emerging technologies. An important shift deals with the control of data used and the intelligibility of algorithms, not only on the Internet but also on other connected services.

h) Cybersecurity

Security plays a key role in the provision and take-up of open eGovernment services. People will not trust and consequently use open eGovernment services if they are not convinced their data are protected and the applications are reliable, tamper-proof and available when required. Public administrations should provide a means so that both the user and the administration can be sure that they are interacting with the intended counterpart. Data should be stored in such a way that only authorised entities can access them and they can be recovered after a security incident.

More research for the development of cybersecurity tools and technologies is needed in order to improve existing solutions and to answer the challenges that new and emerging technologies (e.g., cloud and IoT) pose.

7 METHODOLOGY AND VALIDATION PLAN

The blueprint presented in this report is the starting point of an evolving process that will result in a definite blueprint that will integrate feedback from different stakeholders involved in open eGovernment services. We will use two different complementary approaches: workshops and consultations

7.1 WORKSHOPS

- Mid-November workshop: This workshop will be held in Madrid. The attendees will take part in several activities designed to evaluate the initial blueprint. Feedback from this workshop and the first consultations will be used to produce a second (enhanced) version of the blueprint, which will be object of further assessment.
- Final-conference workshop: The final project conference in mid-February 2018 is a very good opportunity to validate the last version of the blueprint and put the last touches to the definite blueprint.

7.2 CONSULTATIONS

The blueprint will be open to public discussion and anyone will be able to comment on any section. In order to engage relevant stakeholders we will write to all the people in our contact list and ask for their opinions and suggestions.

There will be two phases:

- Phase 1, from 1st November 2017 to 30th November 2017, with consultations on the initial blueprint
- Phase 2, from 1st December 2017 to 15th January 2018, with consultations on the second (enhanced) version of the blueprint, released after the mid-November workshop has taken place.

As of this moment, the blueprint is already publicly available for comments at google drive: https://docs.google.com/document/d/1Jl08eyGjzlHxIL9m2pcMZDKTOiKUuP2p6Oo2_38Z81Q/edit.