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Sustainable and Secure Society
Public Services

A vision for public services

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Disclaimer: The Public Services unit in DG CONNECT has drafted "A vision for public services" with the aim of outlining the long-term vision for a modern and open public sector and the way public services may be delivered in an open government setting (enabled by ICT), i.e. how public services may be created and delivered seamlessly to any citizen and business at any moment of time. Working towards this vision, efforts will continue to move towards, inter alia, full digital reporting to the public sector, seamless cross-border public services, full implementation of the once only principle and enhanced user friendliness, as these can indeed show clear benefits and increase take-up in the medium term.

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Summary

The rapid transformation of our society and the digital revolution, along with budgetary pressures pose **challenges** for governments and the future of public services. This paper looks into **a possible approach; the open and collaborative government model**, based on the principles of collaboration, transparency and participation. Following a brief **historical overview** that points towards a public value and empowerment focused approach, the **drivers of the model** are examined; citizen-, technological- and economic-cost driven issues are assessed, along with the stocktaking of a number of new public policy trends in support of open government and collaboration. The paper then outlines the concrete **mechanism of the model**, based on some first attempts to categorise the various forms of collaborative public service production. In order to better understand the **impact of this paradigm shift**, the expected benefits, necessary enabling conditions and technologies as well as possible measurement tools are discussed [1].

1. Challenges

The evolution of **society** requires public administrations to tackle many new challenges, including those around demographic change, employment, mobility, security, environment and many others.

The recent **technological** innovations such as open data and take up of social media lead to more information and knowledge exchange [2] as well as enhanced connectivity, openness and transparency on all levels [3]. Citizens today are more aware of their rights, have better access to information on public services and consequently have higher expectations of service levels, especially as they become accustomed to private sector organisations providing customisation and other benefits. Furthermore, a number of countries have empowered citizens with "Right to information" legislation [4]. Citizens and businesses are therefore expecting better and more individualised public

solutions and services, efficient and effective service delivery, burden reduction, transparency and participation.

At the same time, **economic** and budgetary pressures force governments to be ever more efficient, reduce costs and be more competitive in a multi-polar world. These challenges, coupled with the financial crisis have created renewed momentum for the modernisation of public administration.

In order to meet these demands, new and creative ways have to be found that improve quality and provide customised solutions, while reducing costs [5].

2. An approach to the future of public services: open and collaborative government

Public services are services offered to the general public and/or in the public interest [6] with the main purpose of developing public value. **Public value** is the total societal value that cannot be monopolised by individuals, but is shared by all actors in society and is the outcome of all resource allocation decisions [7].

As public services need to become more efficient and effective, governments have to consider innovative new ways of developing and organising the public sector for creating public value. Thus, transformation needs to address the way public value is created [8].

The future of government is less and less in the hands of governments alone. Technology has empowered ordinary citizens by offering them a way to make their voices heard and challenge government leaders about their ability and willingness to address public concerns and requests [9]. It is no longer governments alone (the visible hand) or the market alone (the invisible hand) that will respond to these challenges; now also all and any partnerships and groups (many hands) are needed [10]. The increased connectivity of citizens and businesses, the possibility for people to work together, perform tasks and distribute workload regardless of distance and boundaries as well as the availability of previously closed information and data mean that government tasks can also be performed - completely or in part - by citizens, companies and others [1].

A possible approach to pursue is therefore triggered by the advent of social media, ubiquitous mobile connectivity and web 2.0 activities, which allow not just for mass dissemination but also for mass production and collaboration [11]. The term co-production is not new, what is new is the ability of this form of citizen and user engagement as a source of innovation; the implementation of new or significantly improved ways of providing public goods and services [12].

It is considered that engaging with the wider public can help meet the challenge of rising expectations. It will make the services more user-friendly and effective, improve the quality of decision-making, promote greater trust in public institutions and thus enhance public value [13].

This approach, driven by opening up and sharing assets - making data, services and decisions open - enables collaboration and increases bottom-up, participative forms of service design, production and delivery. The kind of public sector organisation that is at the heart of this transformation is **open government**, based on the principles of collaboration, transparency and participation and functioning within an open governance framework (Figure 1).

Figure 1 [14]

Open government
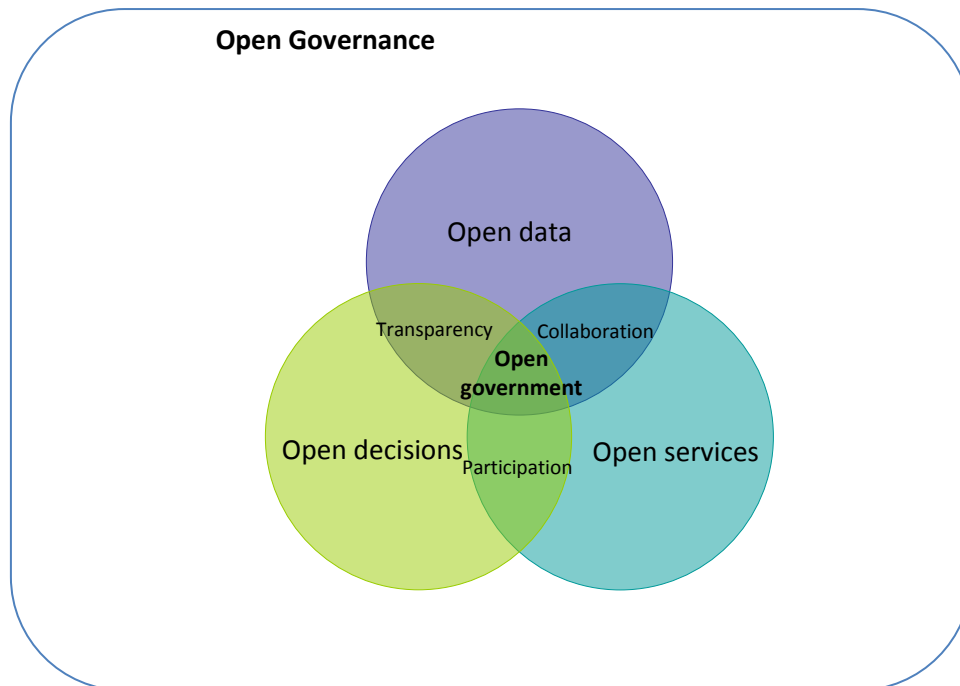
3. Historical overview

Public services and public value are provided in a framework that defines the structures, roles and relationships governing how society functions. This **governance structure** and **public value** have undergone a number of paradigm shifts in the past. Whereas in the 18th century liberal values were central, in the 19th and the 20th centuries Western democracies evolved towards welfare states, predominantly built on the Weberian bureaucracy of which functional division, centralisation and hierarchy are key characteristics [8].

The transformation of the 21st century shifted towards **empowerment** values; the ability and incentive to participate [15], by increasing the capacity of people to function in society [8], empowering citizens and communities to enhance their own as well as collective benefits, extending transparency and openness, personalising services for individual users and empowering the individual service users [8]. In this context the provision of public services is oriented towards the creation of public value and user empowerment [16].

Government is not the only **provider of public services**, as shown by the examples of privatisation, philanthropy and self-help [17]. In Ancient Greece and Rome governments contracted out for example tax collection, army supplies, religious sacrifices and construction to the private sector [17]. The creation of the modern state in the 16th century favoured centralisation and public provision, while the 20th century saw a tendency towards privatisation again [17]. Following the rise of the welfare state, the neo-liberal policies embraced privatisation and liberalisation in certain sectors and demonstrated again that governments indeed are not the only ones to provide these services. The emergence of the voluntary non-profit sector [18] - although originating from the 19th century – became especially recognised for the delivery of public services in the 1980s [17]. Self-help also has old roots; it became an important social policy concept in the 19th century through the increasing

importance of mutual organisations and cooperatives and is now being revived again as social innovation [17]. Other examples include regionalisation efforts in the provision of public services [19], involving local people in a wide range of policy decisions through 'bottom-up' initiatives [20], or the development of public-private partnerships to deliver innovative solutions [15]. While government is not the only possible provider of public service, it has traditionally been responsible for supporting the realisation of public value [16]. Therefore, regardless of the mechanism of service provision, if public services are to become more effective and efficient, they need to also focus on maximising positive outcomes in terms of public value rather than merely minimising costs [21].

4. Drivers of the open and collaborative government approach

The drivers of the open and collaborative government approach may be grouped around citizen-driven, technology-driven as well as economic-cost driven issues [21]. In addition, there are a number of supporting public policy trends that point towards the same model.

4.1. Citizen-driven issues
The recent technological changes lead to a more interdependent, networked world [22] or "networked information economy" [2] that is changing relations in society and the way public value is created; it changes user behaviour.

The age of networked intelligence [23] or "Society 2.0" [24] - enabled by digital technologies and existing networks - fosters greater interaction between institutions, citizens and public and private organisations [24]. The impact of the technological transformation will be even greater on "Generation C" - "C" stands for connect, communicate, change - a demographic group born after the 1990s, who are online most of the time, comfortably participate in social networks as well as generate and consume large amounts of formerly private information [25]. Furthermore, partially due to the economic crisis, the younger generation is leading the way toward a "sharing society"; a form of collaborative consumption; renting, lending and even sharing goods instead of buying [26]. Some literature talks of the emergence of a new kind of "social economy"; relying on the intensive use of distributed technology enabled networks and characterised by collaboration and blurred boundaries between production and consumption [27]. In addition, representative democracy is increasingly being joined by participatory tools for engaging the public in debates and decisions [27].

4.2. Technology-driven issues
ICT-related innovations enable empowerment; supporting individuals in acquiring knowledge, organising themselves to create, produce and deliver anytime and anywhere. They also allow people to be informed about government, to participate in public debates, hold government accountable, produce and deliver services [8]. Opening up public sector information, the spread of social media tools and networks, the possibility to work through platforms, facilitate the connectivity of citizens and businesses. This makes governments also more networked and enhances co-operation within government and with external stakeholders. This increases the role of non-market, non-proprietary production (e.g. emergence of free and open-source software) and creates new opportunities for exchanging information and knowledge in a decentralised manner [2].

4.3. Economic-cost driven issues
Europe needs to mobilise innovation in its public sector if it is to excel and remain internationally competitive in a sector that represents almost 50% of EU GDP and about 17% of employment [28]. Public sector innovation and the modernisation of public administrations are an important underlying factor for economic growth [28]. Addressing problems in the public administration could contribute to fiscal consolidation, competitiveness and growth prospects [29] and also yield considerable public savings [30, 31]. Public administrations have a powerful means to pull innovation; in the EU, the overall market for purchases of goods, services and works by the public

sector accounts for almost 20% of GDP [28]. In addition, the public sector is the largest purchaser of IT, and has the single greatest position of strength to influence the market dynamics, both as a strategy leader, and as a purchaser [32].

The public sector is an important data user and a source of data that can generate benefits across the economy. Some evidence shows that by fully exploiting public sector data, governments could reduce their administrative costs. For Europe's 23 largest governments, some estimate potential savings of 15% to 20% [33]. These figures do not include the additional benefits that would arise from greater access to and more effective use of public-sector information. Estimates suggest the overall economic gains from opening up this resource could amount to € 40 billion a year in the EU [34].

4.4. Public policy trends

While public administrations have been making significant efforts to fulfil their policy objectives, the speed at which social, technological and economic changes are happening today, poses a challenge of adaptation. The strategies, governance models and structures of government departments are not appropriately suited to tackle the complex challenges that cut across sectors, departments and countries [27].

Traditional government, originally built on principles of the industrial society is no longer able to face all the complex demands and problems of the information society, with the trends towards decentralisation and intertwining activities [8]. On the other hand, basic values, such as integrity, legitimacy and accountability remain important. In Europe, governments are expected to adhere to core values, such as protection of civil and political rights, equal opportunities and equal treatment for all [35]. The principles of good governance [36] - openness, participation, accountability, effectiveness and coherence – are commonly shared and the delivery of high-quality public services to citizens is also supported [15]. Governments need to safeguard these values, ensuring that certain public services continue to be provided effectively and that citizens are not adversely affected [37].

Hence, a major challenge for governments is to reinvent models of government in such a way that they match current and future trends and – at the same time – ensure existing and future values of good governance [8].

Certain approaches to public services development provide useful ideas. The "Open Governance Management" vision emphasises collaboration, sharing and transparency between actors with complementary role specialisation moving towards a value network and ecosystem approach to government [1]. The "Digital Era Governance" model proposes reintegration within governments, focusing on user needs and embracing complete digital service delivery [3]. It holds as one of its core assumptions that citizens and businesses will increasingly co-produce most individual outputs using electronic processes, leaving agencies to provide only a facilitating framework [38]. The "New Public Governance" model attempts to understand how self-organising networks implement public policy and deliver public services [39] with greater welfare pluralism and more co-production [40]. It builds on the formation of interactive forms of collaborative governance that cuts across organisational and institutional boundaries [41]. Some scholars speak of the emergence of the we-Government paradigm that treats citizens as partners as opposed to treating them as customers (e.g. e-Government) and the t-Government model (Transformational Government) model, which emphasises citizen empowerment, calling on government to provide the public with the technology tools that enable them to create public value themselves [42]. The current financial crisis also gives rise to the supporters of l-Government (Lean Government) that is about doing more with less by involving other players, in the context of government's changing role where the focus is on orchestrating networks around enabled platforms [43].

On an international scale, the OECD, the UN, the World Bank are concretely looking into the paradigm of collaborative production of public services and most governments in the developed world have embarked on the path towards open government. On a European scale, the eGovernment Action Plan 2011-2015 also recognises that social networking and collaborative tools enable users to play an active role in the design and production of public services [44]. Joinup.eu is a collaborative platform that offers a set of services to help e-Government professionals share their experience with interoperability solutions and support them to find, choose, re-use, develop and implement open source software and semantic interoperability assets [45]. In addition, several other initiatives support the approach, such as for example the Collective Awareness Platforms for sustainability and social innovation [46], Futurium, the online platform that engages stakeholders in the co-creation of futures and policy ideas [47] or the support to web entrepreneurship that stimulates innovative start-ups across the EU [48].

5. Mechanisms of an open and collaborative government: a possible future for public services

Collaboration with citizens and users plays an increasing role in the transformation of public services towards new forms of production and delivery [12].

ICT-enabled **collaborative service production** refers to any public service that is electronically provided by government, citizens, NGOs, private companies and individual civil servants, in collaboration or not with government institutions, based on government or citizens-generated data [17]. It leads to changing roles and relationships, where also the distinctions between professional, politician, practitioner, civil servant, expert, consumer and citizen are blurring [10]. This may make governments "invisible", where the boundaries between public and private services and between the different actors are blurred and where public services are provided in alignment with existing workflows and thereby reduce burden to a minimal level.

ICT-facilitated co-production may take various forms. One possible categorisation distinguishes between the source of data or information and the actual service provider; the combination of these resulting in a number of ways by which collaboration may occur.

Figure 2
Visual definition of collaborative eGovernment [17]

Data source / Service provider	Government	Civil society (citizens and NGOs)	Third party players
Government	Civil servant's innovation	Apps and visualisation	Private-public partnerships, Commercial apps
Citizens	Crowd-sourcing	Self-help and collaboration	Crowd-sourcing

Another classification may be around the public service delivery partnerships – such as citizen to government (C2G), government to citizen (G2C) and citizen to citizen (C2C), but also government to government (G2G) and government to private organisations (G2B) - by looking at the different stages of service delivery (design, execution, delivery, monitoring and evaluation) [11] or by examining the content of collaboration, such as for example (government data, citizen comments), services, processes, knowledge resources, policies, decision-making as well as strategies [21].

Figure 3
Interaction-based collaborations [11]

	Citizen sourcing (C2G)	Government as a platform (G2C)	Do it yourself government (C2C)
Design	Citizen consultation (e.g. eParticipation)	Informing and nudging (government using behaviour economics to design services that encourage the socially optimal option, e.g. through data mining)	Self-organisation (e.g. community portal)
Execution	Crowd-sourcing and co-delivery (trying to find a solution to a problem through the knowledge of the public or personalisation of services)	Ecosystem embedding (government agents becoming part of the community for example through openly sharing government knowledge, infrastructure and assets, e.g. government open sourcing)	Self-service (government expecting citizens to provide a public service themselves, whereby government may provide the facilitating framework, e.g. car-pooling is the 2nd largest commuter transportation system in the US)
Monitoring	Citizen reporting (e.g. FixMyStreet)	Open book government (proactive information dissemination, empowering citizens to hold their government to account, e.g. data.gov)	Self-monitoring (online citizen testimonials)

While the public sector does have in most situations the prime role in ensuring that public value is created, its potential to do so is enhanced through cooperation with others. Acting as an open participation and collaboration platform, making data and information accessible, government can support an ecosystem of actors - interacting organisations and individuals - generating public value [1]. Government as a platform provides a cohesive collection of information assets, services and capabilities, on which communities can interact, engage, develop and exploit their own opportunities, markets and progress [49].

Such co-production may be substitutive (replacing government efforts with resources from users and communities) or additive (adding more user and community support to professional interventions) [50]. Using and combining open data sets can lead to the creation of new functionalities or add-on services, for example for a specific or local need [51]. The data could also be re-used between different government organisations. Open services can be taken up and combined by third parties in order to provide their own value-added services to their customers [52, 53]. A possible approach to such service creation and delivery is the "Tao government" scenario, whereby both government and third parties can collaborate and share responsibilities in producing and providing services according to accepted principles of subsidiarity [16]. The services may be available through "one-stop-shops" on the internet, but could also be embedded into other platforms, which may be controlled by businesses or by professional organisations, acting as providers of value added services or simply as gateways. Alternatively, users may prefer to embed some services in their own electronic environment, such as for example a social networking site or their personal page [16].

Collaborative creation of public services is most likely to first emerge as co-created, additive services, offered as complementary functionalities to existing public services or in areas where gaps in what government was doing were identified by actors outside of government [54]. This may be at local level, where people lead their everyday lives and require public services which are specifically

tailored to their personal needs. This may however evolve in future and complete public services may be taken over by third parties - within the appropriate governance structure. It is expected that social media platforms and mobile applications will increasingly play an important role for governments not only as a communication and engagement tool, but also for improving services, for example in the areas of emergency and economic development [52]. Therefore, interoperability issues will need to be addressed along with the challenge of providing localised services in a pan-European context [55]. By stimulating groups, organisations and companies to come up with innovative solutions to improve service, governments can become smaller and more agile [56]. In order to decide which services governments shall keep and provide themselves and which ones may be delivered by or in collaboration with other actors [57] will greatly depend on legal obligations, values or political priorities [58].

Open government **co-innovates** with everyone, especially citizens, shares resources that were previously closely guarded, harnesses the power of mass collaboration and becomes a stronger part of the social ecosystem. By opening up formerly closed processes to broader input and innovation, it can benefit from the distributed and collective intelligence of crowds (e.g. crowd-sourcing). It can also facilitate sharing, self-organisation, decentralisation, transparency of processes, and plurality of participants [27]. It can also assist social innovation, enabling people to create new and more effective answers to the biggest challenges of our times [27]. Consequently, there is a growing demand for new ways of innovation through more network governance based on public-private partnerships [41].

Open data and information lead to more **transparency, accountability** as well as trust in administrations.

Open participation and open engagement allow legitimate actors to engage in the activities of government in order to enhance public value. Open decisions can empower users to **participate** in policy-making, which can eventually be embedded within wider governance changes across all public sector activities, processes and structures [1].

6. Possible impact of the paradigm shift

6.1. Expected benefits of open and collaborative government

Open government empowers users to directly participate in their own service design, creation or selection. It leads to more user friendly - personalised, pro-active and location-based - services. The approach of open, collaborative government for public sector innovation is also expected to demonstrate economic benefits, although a thorough cost-benefit analysis would need to be undertaken for a better understanding of the real impact.

ICT-driven co-production of services is expected to contribute to cost and burden reductions as well as more efficient resource allocation [59]. It is cost-effective because it relies on the hidden resources of people using the services [18]. It is also efficient, because making information openly accessible saves unnecessary use of resources on data collection [12].

Co-production is also a model by which public services can begin to prevent social problems and needs arising in the first place, reducing demand for expensive critical services [18]. This is in line with the "systems thinking" approach that emphasises the need to better understand user demand and to focus on prevention in an effort to reduce costs [60]. Indeed, fostering collaboration and cooperation across systems and anticipating proactive measures can help governments become less reactive and more insight driven and thereby ensure more meaningful and sustainable public services [61].

It is considered that open government can also lead to business innovation, due to easier access to scientific papers and data. It can stimulate business creation, given that open data and public sector information can create a new market for products and services – and new revenues - that are developed by adding value to the original data provided by a government [62]. It is estimated that opening and re-using public sector information can potentially create economic gains of up to €40 billion annually in the EU [34]. The innovative use of data can also encourage the creation of new jobs [49]. It can also lead to business efficiency, whereby businesses and public bodies can benefit from more open data by gaining more precise and complete insight into users' preferences and needs [62]. Furthermore, access to real time data and information can increase the capacity to respond quickly to rapidly evolving problems or allow citizens to report local problems by locating them on maps [63].

Additional potential benefits can include democratic control. Access to public sector information and to the processes and decision-making mechanisms of public administrations allows more transparency to monitor how the public sector works.

6.2. Creating the right conditions
This transformation involves great challenges technically, politically, legally, organisationally and in terms of working cultures. In order to succeed in the adoption and effective promotion of collaborative services, a change in government and institutional culture is required [64]. Public administrations need to adjust their internal processes; empower their civil servants and incentivise the co-creation approach. They need to ensure that all actors buy into the change process, and to guarantee value for efforts [12].

6.2.1. New governance structure
To reap the full benefits of these concepts, an appropriate governance structure is needed, setting the boundaries of open government and adapting to the collaboration of networks within it. Open collaborative governance encompasses open structures, open organisations and open processes [1]. It provides guidance to foster coordinated collaboration towards commonly agreed goals and ensures responsibility and accountability mechanisms within the given legal framework [65]. The new framework under which open governments may function, will link and integrate the worlds inside government, but also with those outside government. It involves breaking down, or at least cooperation between, silos across different administrations, levels and locations, through sharing infrastructures, processes, data, assets, resources, content and tools [1]. The vision is a "whole-of-government" approach in which the public sector in many ways acts as one entity, especially in its interactions with other actors including citizens and businesses [1]. The model aims at centralising the entry point of service delivery to a single portal where citizens can access all government supplied services, regardless of which authority provides them [66]. This can contribute to minimising duplication of tasks and associated costs and will make government administrations more agile, enabling them to respond better to changes.

Compared with existing solutions of private sector involvement, the emerging focus on collaborative service production focuses on user control and ownership [12]. Therefore, the provider-centric model – where control and accountability is generally expressed in contractual terms – needs to be complemented with mechanisms of accountability control based on peer relationships [17]. Engaging citizens as partners in the production and delivery of services creates a shift in power between service providers and users [12].

6.2.2. Changing roles for government

In an open government model the question is not only about who produces public services, but also about how to distribute public value in society in an optimal way [16] and about how responsibilities can be best shared [42]. In this context, there are some new roles for governments to assume.

On the one hand, governments' role will be to manage and coordinate societal assets. Just as businesses see everyone as an enterprise, as part of the new vision government sees everyone as a resource with assets to contribute [1]. They will need to set rules, provide guidance and incentives for collaboration and co-creation, therefore; establishing a proper framework for this transformation is of great importance. Their role is likely to be concerned with the coordination and integration of public value adding activities.

At the same time, governments must remain accountable and auditable [1]. Governance models will need to ensure certain roles and responsibility for governments, for example around public data quality standards, accountability, relevant legal frameworks, including those on data protection and security. There is also a need for mechanisms to share resources, consider issues around financial and organisational sustainability as well as ensuring that no actors are disadvantaged [1]. As apart from open public data, open user data may also be the basis of new services and since third parties can get involved in co-creation of services, governments will need to consider how to ensure the authenticity and reliability of the new services.

6.2.3. Cultural change and the human factor

Another important element in this transformation is linked to cultural change and the human factor. The engagement of the public and/or of private sector capacities will be key to provide sophisticated innovative public services [16]. The constituency has to be actively engaged in collaborative settings of public service provision. Especially in the context of Europe's pressing societal challenges, there is a need to identify and deploy all the assets and resources available in society but which are often not used or are under-used [1]. Citizens and users may now become developers, creators, and innovators as they use, shape, adapt and create technologies to fit their demands and needs. It may be facilitated by recognising and rewarding public sector innovators and supporting relevant education and training to drive further change. Users will need to have the skills and equipment necessary to benefit from - and perhaps also participate in developing - public services [8].

There is a need to modernise the civil service to accelerate innovation in government, as civil servants will also have an important role to play. Empowered, motivated civil servants with the right skills, tools and mechanisms continue to be a great asset [55]. Engaging public officials will require answering many questions around the process in a coherent manner; for example on the proper balance between open government - open data, open access, transparency and accountability - and the sensitivities of security and risk management [9].

6.2.4. Incentives for mobilisation and sustainability

The rationale behind open and collaborative government is that the more people use public services, the better these services get [67]. The more citizen feedback, the more accurate the information gets and the more value the application has [68]. It is therefore important to mobilise the relevant constituency to engage in collaboration and in the further take-up the new services. Incentives can be around various recognition and funding mechanisms, business support, or using engaging tools such as for example games [69].

For the moment, the majority of collaborative eGovernment services are based on voluntary work, with little evidence of government or NGO funding, let alone private funding [17]. Although volunteering has the potential to empower and motivate citizens and civil servants, solutions will have to be found to ensure the favourable conditions for sustainable service production [17]. While smaller applications addressing specific or local needs may be easier to maintain, new business models will need to be identified to support the scalability and sustainability of certain services.

Current business models do not adequately exploit the benefits of participation and collaboration [10]. Attempts to identify new business models are being made in the private sector as companies are going beyond the traditional customer-vendor relationship to co-create value with customers, engage customers to assist with the design of new products or solicit them to create content for public consumption [70]. One of the main challenges is however, how to attract business to make use of public platforms to create more value [43]. While collaboration is not a new phenomenon, what is novel is the emergence of hybrid organisations that combine elements of the public, private and social sectors [71]. Nevertheless, a few models are emerging, for example the e-Government premium model, based on a progressive scale of sophistication while moving up in the price scale or the e-Government seed funding model, which crowd-sources public service ideas for services not currently met by the government, assesses whether there is a "market" for the specific service and whether and how to fund it [72]. Other business models include more traditional advertisement-based approaches [72], public-private partnerships, public voluntary sector partnerships, shared services, outsourcing [4], public sector mutuals [73], social enterprises and others. Many are still in their infancy but with the open data momentum, more experience is likely to be gained by entrepreneurs with a collaborative vision [72].

6.2.5. Necessary R&I: Technological enablers [74]
In order to enable the above trends, ICTs can help governments to engage the world outside and link up inside in order to support the creation of public value. Transformative technologies can lead to changing the value chain and relationship between actors and bring in new solutions to the complex problems that governments are facing [8].

New types of infrastructure are needed where public value is created by the ability to share, interact and collaborate between actors. Novel processes and approaches are required with a decentralised, cross-government and multi-actor architecture, coupled with the integration of big data and the role of social tools [75]. Potential problems related to security, privacy and data protection issues will also have to be tackled.

An open governance framework also requires more focus on interoperability (both at the organisational and the technological level), open standards, and cloud computing. In terms of web evolution, this is mainly a web 3.0 development, related to the machine integration of data, knowledge and applications to make the web a more meaningful and collaborative platform [1]. In relation to front-office applications, social media and mobile will continue to have a big impact. Growing research demonstrates the potential of mobile communications to radically transform governments and to provide access to public information; m-Government is therefore emerging as the next big wave for ICT use in the public sector [76].

Overall, the public sector often needs to combine and build on top of technology elements developed elsewhere, adapting and integrating these for public sector use, which is itself a major technology challenge.

6.2.6. Political support

For this transformation, there is a need to change cultures and ways of working, which requires strong political commitment and leadership impacting every level of government. Governments need to align new, open and collaborative service models with new opportunities for growth; they need to transform the way public services are delivered. This can enable the development of markets for innovation, provided that the macro-policy context encourages innovation, and allows openness and collaboration [77].

Policy strategies and actions need to take into account the realisation of empowerment values. This involves personalised and pro- active knowledge about user needs and the ability to translate these into diverse services, interfaces and access channels. The new model for public service delivery needs to be based on a willingness to change governmental operations, institutional arrangements and culture [8].

The trend towards an increasingly networked government, will involve cooperation and coordination at all levels as well as with new stakeholders and intermediaries [8]. The traditional 4-layer vertical subsidiarity, which distributed power and tasks between the European, the national, the regional, and the municipal government layers will have to be complemented with a horizontal subsidiarity distributing power and tasks between government and non-government actors [78].

As open government is defined and implemented differently across countries, sharing good practices and experience will be crucial. In particular, examples of networked governance especially in cross-border context would be of interest to share [79].

6.3. Measurement

Although the concept of open government is widely supported, there is little evidence about which policies actually have an impact on achieving greater openness and what the exact cost and benefit of such policies would be [80]. Measuring government performance has long been recognised as necessary for improving the effectiveness and efficiency of the public sector. Following the fiscal and economic crisis, decisions about how and where to prioritise spending, reduce costs and promote innovation in the public administration have become even more important [81]. In addition, it is increasingly important to identify emerging best practices and appropriate applications [11].

Over the last few years a few trends have emerged in measurement and monitoring supported by ICT. There is a tendency to move up the value chain; moving away from only focusing on the traditional inputs and outputs towards outcomes and impacts (such as successful service use, administrative burden reduction, user satisfaction and fulfilment, and even competitiveness, growth, jobs, social cohesion, inclusion and democracy) [82]. There is also a trend to move down the government hierarchy; away from a focus only on central government's administrative functions, towards local measurement. There is also a development to move out of the government institution, recognising that everyone can potentially measure and monitor the public sector and that this can be done either in collaboration with government or independently. Measurement can also be more immediate and thus respond more quickly and precisely through learning and exchanging experiences in real time [1]. ICT also provides new measurement and monitoring tools, such as various website metrics, analytics, smart data visualisation, capturing user experience, listening and monitoring tools, etc.

A number of concrete metrics are being considered for public sector innovation. Some suggest avoiding the focus on specific targets, but rather measuring the outcome or impact; such as for example improvement in organisational key performance indicators, in service or efficiency [83]. Other approaches recommend a holistic approach to government performance along four indicators linked to becoming flatter, agile, streamlined and tech-enabled (FAST) [9]. Flattening refers to

increased citizen engagement, decreasing layers of hierarchies and thereby more administrative efficiency, evidence-based decision-making and intergovernmental and cross-sectoral collaboration. Agility and adaptability assess the ability of governments to quickly address new challenges. Streamlined governments strive for the appropriate workforce, while tech-enabled public administrations support new modes of collaboration, information and intensive governance [9].

Another set of measures focuses on measuring the value of the transformation to citizens; assessing the improvements in "public value" from the point of view of citizens [9]. This could be reflected through the quality of the public services, user satisfaction or enhanced trust in government. The systems thinking approach also emphasises the need to measure the performance and value in the users' terms. They also argue that the methodology for measurement should be in the hand of the workers as it will likely trigger more innovation [60]. Other criteria for assessing the impact of collaborative service production initiatives may include carrying out design evaluation, whereby the appropriateness of the platform design would be examined, process evaluation – in terms of transparency, participation, and collaboration -, and outcome evaluation [84].

Following the Europe 2020 Innovation Union flagship initiative, the European Commission launched a pilot European Public Sector Innovation Scoreboard (EPSIS) with a view to improving the ability to benchmark the innovation performance of the public sector in Europe. The measurement takes into account indicators around the quality of public administration employees and that of public services. It also examines in-house innovation capacity of public administration organisations as well as drivers and barriers, including the role of management in this process. It also looks into the effects on business performance [85].

7. Conclusion

The current social, technological and economic changes create challenges and new expectations for public services. Given that these challenges are largely intertwined, any vision for the future of public services needs to have a multi-disciplinary approach. A solution may be embracing open government, based on the principles of collaboration, transparency and participation within an appropriate governance framework. Such an open government model builds on open data, open services and open decisions. The provision of public services results in the creation of public value. Empowering individually and collectively all actors that play a role in the constitution of society and sharing resources between all stakeholders will contribute to the creation of public value.

The vision is that in future, governments will be connected, networked and fully joined-up and will interact with each other and with private actors. The services will be more personalised, allowing users to design and create. This is likely to happen in an open and participative governance structure [86], where both administrations and third parties can collaborate and share responsibilities in producing and providing services according to the accepted principles of subsidiarity [87]. This requires dissolving governmental silos; moving towards a "whole-of-government" approach [88]. There is a need to continue providing data and public sector information, but also modular, re-usable public services in a way that makes sense to citizens. With the appropriate, flexible and sustainable engagement business model and the right infrastructure, this can increase collaboration, service production and responsible information sharing [49].

While traditionally, the role of governments has been recognised as an enabling one, they now also need embrace innovation as a means of driving public value. They need to engage in public entrepreneurship, using a whole range of policy tools to mobilise the untapped resources in and outside of government, support innovation through new, collaborative business models and ultimately drive economic growth [77].

This paper recognises that for the moment the number of citizens and businesses involved in the production and delivery of collaborative public services is probably relatively low. Therefore, actions will need to continue to move towards, inter alia, full digital reporting to the public sector, full implementation of the once only principle and enhanced user friendliness as these can indeed show clear benefits and enhance take-up in the medium term. In addition, there is a need to better understand the costs and benefits of collaborative service production [12], in order to demonstrate its exact economic impact and financial sustainability.

Nonetheless, the above shall help pave the way towards the long-term vision that in future, citizens and businesses in Europe shall benefit from ubiquitous public services, offered by either the public or private sector. The services shall be available electronically and work anywhere in Europe, also cross-border, due to the availability of re-usable basic services that may be combined collaboratively by various organisations into new services. The services shall be adapted to the way citizens are communicating, be accessible through a variety of channels and be delivered in a personalised, pro-active way and to a variety of devices.

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