

Roadmap for digitalization

Description and state of the art	
 <p>Definition</p>	<p>Trend, based on the advancements of digital technologies. Digitalization is the use of digital technologies to change a business model and provide new revenue and value-producing opportunities; it is the process of moving to a digital business[266].</p> <p>Digitalization is a sub-process of a much larger technological progress, involving digitization (the conversion), digitalization (the process) and digital transformation (the effect) that are collectively accelerating the global and societal transformation process. In this context, digitization represents the conversion of analog information into digital form that can be understood by computer systems or electronic devices, digitalization corresponds the process of the technologically-induced change, whereas digital transformation is described as the total and overall societal effect of digitalization[267]. In a narrower sense, digitalization as well as digital transformation may refer to the concept of "going paperless".</p>
 <p>Addressed societal /business or public sector need</p>	<p>Public sector need:</p> <p>Increase resource productivity</p>
 <p>Existing solutions /applications /services</p>	<p>We can mention as an example:</p> <ul style="list-style-type: none"> • STORK project[250] • PAE (Portal Administracion electronica)[268] • Cita Previa de Atención Primaria (online medical appointment)[269] • Agencia Tributaria[270]
 <p>Main actors regarding R&D of this</p>	<ul style="list-style-type: none"> • Fraunhofer-Gesellschaft zur Förderung der Angewandten Forschung e.V. • Universität Koblenz-Landau • Brunel University • Ethniko Kentro Erevnas Kai Technologikis Anaptyxis • Liquid Democracy Ev • University of Leeds

<p>technology</p>  <p>Current research activities</p>	<ul style="list-style-type: none"> University of Newcastle Upon Tyne <p>EU R&D projects and programmes</p> <p>In the last years, there have been few projects which are dedicated to the digitalization of administrative work in general (e.g. EIII, TEL-CONVERGENCE), but several very specialised projects e.g. cataloguing of ancient artworks, shoe development for diabetic feet.</p> <p>Other national or international R&D projects and programmes</p> <p>Digital Work Design (BMBF), Digitalisation and the future of work (BMBF); EUREKA project (Dev. Of a next generation evaluation module for complete tender management software that enables full e-procurement); CDTI (Spain): Digital transformation of the public administration</p>
 <p>Impact assessment</p>	<p>Public sector modernization:</p> <ul style="list-style-type: none"> Efficiency / Productivity Sustainability Cross-organization Cooperation Quality of Services Provided Image Modernization Level of participation <p>Public Sector as an Innovation Driver:</p> <ul style="list-style-type: none"> Innovation ICT Infrastructure e-Security
<p>Necessary technological modifications</p>	
 <p>Potential cases use</p>	<p>Digital transformation promises great things for the public sector and the citizens it serves, from lower costs and greater efficiency to real-time services, seamless communication, and enhanced program effectiveness. Shared services, greater collaboration and integration, improved fraud management, and productivity enhancements enable system-wide efficiencies.</p> <p>Digitalization in the public sector also provides greater access to services for rural populations, improve quality of life for those with physical infirmities, and offer options for those whose work and lifestyle demands don't conform to typical daytime office hours.</p>
 <p>Technological challenges</p>	<ul style="list-style-type: none"> High initial investment and maintenance costs. Availability of digital equipment (e.g. computer) needed. Digital literacy and competence needed both in the back office and in the front desk.
<p>Necessary activities (in or for the public sector)</p>	

 <p>Development of a specific training necessary</p>	<p>Open task</p>	<p>The complexity of large-scale digital projects requires specialized skills and expertise. According to a recent survey of Oxford Economics[271], public sector executives lack confidence in their organization’s digital proficiency. For this reason, cultivating digital skills among both senior leaders and the general workforce should be a priority.</p> <p>The EC has also called eGovernment stakeholders through the eGovernment4EU platform and many answers pointed out the need to upskill civil servants[272].</p> <p>Deloitte[273] identifies these skills necessary for digital transformation in the public sector: technological savviness, user experience design, agile structure, business acumen, collaborative processes and entrepreneurial spirit.</p>
 <p>Advanced or adapted ICT infrastructure needed</p>	<p>Open task</p>	<p>Public sector’s robust IT infrastructure needed to support new digital tools is often outdated or not easily scalable. Public sector must upgrade, connect and consolidate their infrastructure before it becomes obsolete and unable to support digital and collaborative environments.</p>
 <p>Change of (public sector internal) processes necessary</p>	<p>Open task</p>	<p>Digital technology offers public sector organizations an opportunity to operate more efficiently, offer improved products and services, and ultimately better serve citizens. Digital transformation is more than implementing a particular piece of technology, it requires a new framework that allows government to upskill its workforce, remake processes, develop diversity, and attract and retain talent.</p> <p>Digital transformations require changes, to both processes and IT systems, which are more challenging to implement in the public sector than in the private sector.</p>
 <p>Promotion of information / of</p>	<p>Open task</p>	<p>In relation to this point, the need is more oriented to the promotion of digital and economical capacities of some groups of the population.</p> <p>Digital devices are commonplace, but not for all</p>

stakeholders necessary		groups of citizens, so there is a need for multiple touchpoints and expect unified, multi-channel experiences.
 Need to deal with cyber security issues	Open task	<p>During the last few years, the World Economic Forum identified cyberattacks and critical-systems failure as two of the most dangerous global risks[274] because, beyond financial losses, cyberattacks may pose serious reputation risks for companies and governments.</p> <p>It's critical to make online security simple for citizens while maintaining strong protections for their private data. Besides, an increasingly mobile workforce can expose government networks to additional vulnerabilities.</p>
 New or modified legislative framework or regulations necessary		No especial needs identified. The necessary regulation is already in place.
 Development of a common standard necessary	Open task	Government institutions need adhere to specific methodologies and guidelines when planning their digital strategies to reduce unnecessary investments, enforce common standards, and build greater project synergies.
 Need for a more economical solution	Open task	Although it is necessary to invest in a comprehensive public sector digital transformation, it results in savings of time and money. In fact, and according to a McKinsey study[275], capturing the full potential of government digitization could free up to \$1 trillion annually in economic value worldwide, through improved cost and operational performance.
Dealing with challenges		
 Ethical issues		No issues identified.

 Societal issues	Open task	While process automation and self-service are a must to accommodate growing (and demanding) citizen populations, there are some groups that may be left behind: elderly, impaired, less well-off citizens...so there is a need to bridge the digital divide.
 Health issues		No issues identified.
 Public acceptance	Open task	Public organizations are not only tasked with doing more with less money, they must also meet increasing digital interaction demands from technology savvy constituents.