Horizon 2020 project proposal

Cover page

Pillar: Societal challenges
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INTERPARES DISRUPT: INTERDISCIPLINARY RESEARCH ON PUBLIC ADMINISTRATION DISRUPTED E-SERVICES

I DISRUPT

PART B – SECTIONS 1-3

List of participants

Participant No.	Participant organisation name	Country
1 **Project coordinator**	Sveučilište u Zagrebu, Filozofski fakultet (*University of Zagreb, Faculty of Humanities and Social Sciences*) (FHSS)	Croatia
2	Haute Ecole Specialisee de Suisse Occidentale (*Geneva School of Business Administration HES-SO, University of Applied Sciences and Arts Western Switzerland*) (HEG)	Switzerland
3	The National Archives (TNA)	United Kingdom
4	Dedagroup Public Services SRL (DedaPS)	Italy
5	University College London (UCL)	United Kingdom
6	Hacettepe Universitesi (*Hacettepe University*) (HU)	Turkey
7	Ernst & Young Savjetovanje d.o.o. (*Ernst & Young Advisory d.o.o.*) (EYS)	Croatia
8	Universita degli Studi di Macerata (*University of Macerata*) (UniMC)	Italy
9	Enigio Time AB (ETS)	Sweden
10	Ayuntamiento de Girona (*City Council of Girona*) (CCG)	Spain
11	Universite de Geneve (*University of Geneva*) (UNIGE)	Switzerland

In-kind contribution partners - third parties

Participant organisation name	Country
Hihgflott d.o.o. (HFT)	Croatia
Israel State Archives (ISA)	Israel
Individual participant Ms. Silvia Schenkolewski-Kroll (SSK)	Israel
University of Bologna (UniBo)	Italy

International Partners

Participant organisation name	Country
University of British Columbia (UBC)	Canada
University of Brasilia (UnB)	Brazil

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1. Excellence

1.1. Objectives

Businesses and government activities rely on documented, reliable, accurate and authentic information which should be available in a timely manner, collected, processed and disposed in compliance with privacy/PII/data protection legislation and in a form that supports and streamlines **a) decision-making processes** (deriving from trust in the data), **b) accountability** (achieving trust in the decision-making process), **c) transparency** (enabling trust in the democracy), and **d) re-use** (creating new values).

Modern public administrations offer numerous services available to businesses and wide public and their purpose is to serve the overall wellbeing. Therefore, it is of crucial importance that public services are being provided efficiently and that they have an actual desired effect.

The challenge of modern public services is the growth of information which is exponential and public administrations, in their relations with citizens and businesses, can hardly keep up with the growing demands for quality of information, timeliness, unbiased decision-making, transparency, accountability, social justice, and support of societal memory. This is happening in the age of the **disruptive technologies** which additionally tends to set the established processes out of balance, e.g. by eliminating the trusted third parties. While the technologies are being developed in a lightning-fast manner, resulting in simultaneous application of several generations of technology in highly heterogeneous environment, governments and regulators are responding slowly and sometimes inefficiently.

In order to tackle, among other, issues that arise from inefficient provision of public services, potential lack of transparency and accountability in provision of public services, the EU has been promoting numerous initiatives and good practice both on European and national levels. On the other side, and complementary to efficiency of public services, the EU has been promoting digitization of public services and wide spreading of modern technologies in various sectors, including public administration. Some of the most significant frameworks and concepts are:

1. **Good governance** – Good governance implies effectiveness and transparency of public authority and administration, which requires effective provision of public services as well as clear and transparent provision of public services with high involvement of the citizens. The quality of public administration has direct impact on economic productivity, competitiveness and growth, and thus to quality of public services, living standard and sustainable development. This requires, among other, organizational and technological changes in public services.

2. **Digital Single Market** – The EC aims for an inclusive digital European society including achieving international, efficient and safe digital public services and eGovernment to its users, i.e. businesses and citizens. In order to achieve this goal, the research needs to be conducted on current conditions and needs to assess future possibilities of using new, i.e. disruptive technologies in public services processes and procedures.

3. **E-services and building blocks** – Under Connecting Europe Facility (CEF) programme, which is one of European Commission instruments for project financing and has synergies with Horizon 2020, a set of generic and reusable Digital Service Infrastructures (DSI), also known as building blocks, has been defined and the EU is financially supporting their development. The aim is to achieve higher efficiency of public services, i.e. interoperability of IT systems and their intercommunication across borders and sectors within the EU by taking full advantage of digital technologies so that citizens, businesses and public servants can benefit from digital public services anywhere in Europe.

All the above mentioned is ultimately contributing to achievement of **EUROPE 2020** goals as well as **freedom of movement** (of services), which is one of key EU concepts.

The proposed project – InterPARES Disrupt is looking to contribute to all the above mentioned elements of the EU policies that aim to reach inclusiveness, efficiency, transparency, accessibility and accountability of public services.

The overall objective of the InterPARES Disrupt project is to identify concrete benefits, risks and social impact of introduction of disruptive technologies into selected public administration e-services in order to improve their inclusiveness, efficiency, transparency, accessibility and accountability.

Specific objectives of this project are:

- to explore the process cycle of selected public administration e-services as well as impact of disruptive technologies in public administration (G2C, G2B), their constraints, difficulties and effects including influence on efficiency of public services and relations with citizens, businesses and public servants.

- to explore wide range of technologies (AI, Big data analytics & visualization, Blockchain, DLT and algorithmic techniques, Simulation (conversational, VR, AR, MR) & gamification, Intelligent automation) in public administration processes considering the steps of the data, information, documents and records management process.

- to determine technologies with greatest positive disruptive potential for improving processes and procedures in public administration.

- to enable and induce the introduction of disruptive technologies in public e-services processes by sharing project progress and results and ensuring its dissemination and exploitation among relevant public.

The InterPARES Disrupt project objectives will be reached via implementation of activities under the following work packages:

- WP1: Exploration of Existing and Emerging Disruptive Technologies (AI, Big data analytics & visualization, Blockchain, DLT and algorithmic techniques, Simulation (conversational, VR, AR, MR) & gamification, Intelligent automation),

- WP2: Information Creation and Management (research on process level),

- WP3: Preservation and Access (research on process level),

- WP4: Construction and Integration of Disruptive Transformation Technologies (piloting and testing of application and impact of disruptive technologies on selected use cases),

- WP5: Communication, Education and Knowledge Dissemination,

- WP6: (Self)Evaluation and impact,

- WP7: Project Management.

Overall and specific objectives of InterPARES Disrupt project are **in compliance** with overall objectives of Horizon 2020 since they are contributing to economy development, strengthening of cross-border cooperation, increasing research and innovation activities in the EU as well as providing response to society challenges and increasing its welfare. To be more concrete, the proposed project and its objectives are in line with objectives and activities listed in **Point 6: Europe in a Changing World – Inclusive, Innovative and Reflective Societies in Annex I of EU Regulation No 1291/2013 establishing Horizon 2020 – the Framework Programme for Research and Innovation (2014-2020), specifically:**

- **Inclusive societies** – by researching and testing which disruptive technologies are most appropriate for selected public services that are being provided in all EU countries and beyond EU borders, the InterPARES Disrupt project is contributing to implementation of trusted practices and services that are necessary to build resilient, inclusive, participatory, open and creative societies in Europe (and beyond).

- **Innovative societies** – by identifying potential use, benefits, risks and social impact of wide range of disruptive technologies on all parts of public service process cycle and by giving recommendations for implementation of appropriate disruptive technologies in public e-services which face most serious bottlenecks, the InterPARES Disrupt project is contributing to exploration of new forms of innovation and understanding how forms of innovation are developed, succeed or fail. It also promotes coherent and effective cooperation with third countries and has a cross-border effect, since some of the partners are from non-EU countries and project already has strong support from some of most significant international organisations, such as International Federation of Red Cross and Red Crescent Societies (IFRC).

- **Reflective societies** – by researching impact of disruptive technologies on data collection, management, preservation and access, the InterPARES Disrupt project contributes to efficient storage of information and to fast open access to data, which enables further research of various fields including history, literature, philosophy, religion.

1.2. Relation to the work programme

InterPARES Disrupt targets the topic "**Transformative impact of disruptive technologies in public services**".

The name of the project **InterPARES Disrupt** respects the history of international multidisciplinary research on the trustworthiness of digital records and expresses its intention to build on the results, products and achievements of the previous four InterPARES (International Research on Permanent Authentic Records in Electronic Systems; also Latin *inter pares* – among peers) projects (1999-2019), funded primarily by the Social Sciences and Humanities Research Council of Canada (SSHRC), but also by other funding agencies of participating countries, by investigating trustworthiness of records in the age of technological disruption.

The first project "International Research on Permanent Authentic Records in Electronic Systems" (1999-2001) focused on the preservation of the authenticity of electronic records that are no longer needed by the creating body to fulfil its own mandate, mission or purpose. The records examined were primarily textual documents produced and maintained in databases and document management systems. This phase has produced a variety of findings, including conceptual requirements for authenticity and methods for the selection and preservation of authentic electronic records.[1]

The second project "Experiential, Interactive, Dynamic Records" (2002-2007) has developed and articulated the concepts, principles, criteria and methods that can ensure the creation and maintenance of accurate and reliable records and the long-term preservation of authentic records in the context of artistic, scientific and government activities that are conducted using experiential, interactive and dynamic computer technology.[2]

The third project "Theoretical Elaborations into Archival Management (TEAM): Implementing the theory of preservation of authentic records in digital systems in small and medium-sized archival organizations" (2007-2012) translated the theory and methods of digital preservation into concrete action plans for existing bodies of records that are to be kept over the long term.[3]

The fourth project "Trust and Digital Records in an Increasingly Networked Society" (2013-2019) aimed at 1) generating the theoretical and methodological frameworks that will support the development of integrated and consistent local, national and international networks of policies, procedures, regulations, standards and legislation concerning digital records entrusted to the Internet; 2) ensuring public trust grounded on evidence of good governance; 3) ensuring a strong digital economy, and 4) ensuring a persistent digital memory.[4] During the last phase, members of the InterPARES Disrupt consortium have led and participated in the EU studies "Comparative Analysis of Implemented Governmental e-Services", "Analysis of the Interoperability Possibilities of Implemented Governmental e-Services" as well as an e-IDAS related study "Model for Preservation of Trustworthiness of the Digitally Signed, Timestamped and/or Sealed Digital Records (TRUSTER Preservation Model)" which has proposed the Validity Information Preservation (VIP) blockchain-based "TrustChain model" which is planned to be further investigated in the context of e-services and piloted in this project. In this way, the research proposed in this project will benefit from the vast created body of knowledge and previous research done by the EU Team researching the topics of interest primarily for the EU, but relevant globally.

InterPARES Disrupt project will also challenge what has been created during the previous four InterPARES projects by confronting the theoretical knowledge with the new disruptive technologies. The research might conclude that the well-known and established archival theories and methodologies should be amended or written all over again in order to accommodate processes with data, information documents and records relying on the disruptive technologies, uncertainty, complexity, and distributed resources.

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[1] InterPARES 1, http://interpares.org/ip1/ip1_index.cfm
[2] InterPARES 2, http://interpares.org/ip2/ip2_index.cfm
[3] InterPARES 3, http://interpares.org/ip3/ip3_index.cfm
[4] InterPARES Trust, https://interparestrust.org/

Contribution of this project to addressing specific challenges (Table 1) and scopes (Table 2) of this topic of the Work programme are shown in detail in the following tables.

Table 1. Contribution of the InterPARES Disrupt to addressing specific challenges

Specific Challenge	Project's response
The project should assess the potential benefits and risks of using disruptive technologies in public administrations.	The InterPARES Disrupt project aims to explore the existing and emerging disruptive technologies as well as processes in the context of public services (G2C, G2B). **Research will lead to identification of possible threats and benefits of implementing wide range of disruptive technologies into public services administrative processes**. The research will be done by researchers from diverse fields of knowledge to assess wide range of possible impacts. This includes identification, evaluation, and prioritization of risks and benefits, which will be assessed in a way to cover various aspects, such as impact of disruptive technologies on efficiency, quality, transparency, inclusiveness and accessibility of public services; impact on social groups and communities; impact on economic development; impact on democracy and decision-making; impact on public trust in public governance, policies and services. This implies political, socio-economic, legal and cultural dimensions of project research.
The project should assess the potential social impact (including impact on public servants) of using disruptive technologies for government processes and governance.	The results of this research will show potential risks and benefits of using disruptive technologies among public servants, citizens and businesses. Introduction of new processes, technologies or any change of already established state and practices can cause rejection because of fear of unknown and/or could confront the problem of insufficient knowledge from the existing users. If this barrier of rejection is successfully removed, the impacts of disruptive technologies in public administration can be various. For example, less employees needed in public services due to increased administrative efficiency, additional training for public servants, additional instructions for end users (citizens and businesses), increased entrepreneurship culture due to faster administrative procedures, etc. **This can have various social impacts such as impact on employment, impact on education due to demand for less administrative skills and more technological and managerial skills, impact on GDP and consequently on overall social welfare, etc**. Another aspect that will be examined is impact of disruptive technologies on levels of transparency and thus trust in government processes as another dimension of social impact, i.e. impact on perception in various social groups.
The project should assess the political, socio-economic, legal and cultural implications of disruptive technologies and their acceptance for public administrations and citizens.	The InterPARES Disrupt project applies an interdisciplinary research approach. The Project partners come from diverse knowledge fields (data management, government and public sector performance improvement, development and implementation of disruptive technologies in private and public sector, archiving, law, cybersecurity and data protection, customer experience and dissemination) and have diverse experiences that will support the assessment of different aspects of implications and acceptance of disruptive technologies. During the whole timeline of the project, the project team will monitor political, socio-economic, legal and cultural implications of disruptive technologies and their acceptance for public administrations, citizens and businesses. **This includes numerous aspects, such as: impact of disruptive technologies on policy-makers from data security and citizens protection aspect; impact on regulators of the market as disruptive technologies create winners and losers; impact on labour demand and employment; impact on communication patterns and public interest; impact on development of new forms of provision of services (legal, advisory, commercial, etc.), etc**. Under the InterPARES Disrupt project a wide survey of citizens' and public administrations' opinion on provision of public e-services and disruptive technologies will be conducted.

Table 2. Contribution of the InterPARES Disrupt to addressing specific scopes

Scope	Project response
The project should examine how emerging technologies can impact public sector.	The InterPARES Disrupt project will measure the potential impacts of implementing disruptive technologies in selected public administration e-services. Selected e-services will be broken down into steps of the information processes (data (re)creation and collection, data management, data preservation and data access). For better assessing of which technology is the best for improvement of certain process in public e-services, a wide range of technologies will be taken into examination (AI, Big data analytics & visualization, Blockchain, DLT and algorithmic techniques, Simulation (conversational, VR, AR, MR) & gamification, Intelligent automation). **This includes measuring the potential of increasing trustworthiness of data, social impact (for citizens, businesses as well as public administrations), efficiency gain and increase of transparency for public services**. Also, scenarios of implementing and not implementing disruptive technology-based solutions would be analyzed in order to determine possible benefits and risks.
The project should pilot the technology to examine how emerging technologies can impact public sector.	**The InterPARES Disrupt project includes two types of pilots in order to ensure research of wide range and specific impacts of technologies on public sector.** One group of pilots will be done for public administration processes that are present in all or almost all public services. These pilots will examine selected technologies which showed the highest potential in achieving positive impact, in selected use cases of partners who can provide access to the public administration materials. The other group of pilots will be selected through the InterPARES Disrupt project research. For both groups of pilots, partners will note observed results of implemented disruptive technologies on selected processes and e-services and prepare a report containing measured outcomes (such as duration of processes, impact on workload, impact on data access, impact on data protection, etc.).
The project should explore in a wide-ranging fashion the issues surrounding the use of emerging technologies in the public sector.	The InterPARES Disrupt project will explore the existing and emerging disruptive technologies as well as processes in the context of selected public e-services. The processes that will be studied are all the processes within public administration. **Under this project the currently used technology in public services will be studied and compared to various available disruptive technologies which can potentially replace or upgrade currently used technologies**. As already mentioned, a wide range of disruptive technologies' impact will be examined. This includes identification and examination of issues connected with use or absence of use of different disruptive technologies in the public sector. During the whole project it is planned to monitor internal and external environment through different dimensions (political, socio-economic, legal, technological and cultural) in order to assess wide range of possible obstacles that could occur from either introducing or failing to introduce the emerging technologies in the public sector as well as to develop solutions for overcoming the identified obstacles.
The project should engage multidisciplinary partners, stakeholders and users.	The InterPARES Disrupt project has set up an **international multidisciplinary group of partners from academia, public sector and business sector**. More specifically, the engaged experts have expertise in various fields, all relevant for research and innovation under this project: data management, government and public sector performance improvement, development and implementation of disruptive technologies in private and public sector, archiving, law, cybersecurity and data protection, customer experience and dissemination. The project partners are from the EU, while supporting partners are from Canada, Brazil and Israel. An Advisory Board will also be included in the project as additional advisory, monitoring and quality assurance mechanism, where these will be experts with specific expertise in relation to certain disruptive technologies and expertize in relation to research methods. The project developments and results will be closely followed by the transnational nongovernmental institutions like the

	International Federation of Red Cross and Red Crescent Societies (IFRC), public sector institutions like National Archive of Brazil. The results of this project are expected to be used in theoretical (for further research) and practical sense (for wider deployment of piloted solutions). The intended users are first and foremost public administrations in the EU countries, as well as their citizens. However, **it is expected that the project results will have a strong cross-border impact on the non-EU countries as well**, since some of the project supporting partners are located outside of the EU/EEA and a network partners from previous projects will closely monitor this project's implementation and **transfer its results to other continents**.
The project results should lead to the development of business plans that would ensure the long-term sustainability of the services offered based on the used technology.	By knowledge dissemination, communication and education the InterPARES Disrupt project aims to inform the public and interested stakeholders about progress of the project and ensure the exploitation of its results. One of the main deliverables of the project will be a report that will contain measured quantitative information about impact of application of disruptive technologies in public service processes. **Since the project results will be disseminated, this will enable public administrations and even businesses to get an insight on multiple levels of impact of disruptive technologies, which will enable them to prepare their business plans, action plans and strategies for implementation of disruptive technologies which have proven to give the best results for specific processes**. The results will enable entrepreneurs to develop new business plans applicable both to their work and communication with public services based on disruptive technologies, but also to develop advisory services and products based on disruptive technologies which could enhance efficiency and transparency. The project will also focus on legacy building thus allowing its impact to continue.

1.3. Concept and methodology

1.3.1. Concept

Public administration, citizens and businesses should acknowledge that the established processes, having a long tradition, are being disrupted and that they cannot use the 20th Century tools and approaches to solve the 21st Century challenges. For example, the redaction of sensitive (e.g. personal) information form the records before they are made public is a challenging task even when done by the trained professionals (e.g. archivists). Automating this task would require introduction of procedures like automated named-entity recognition, machine learning, pattern recognition, natural language processing, i.e. artificial intelligence. Hence, the disruptive technologies should be embraced in an interdisciplinary manner and put to their best use with the aim to facilitate the information governance, documents and records processes and their outcomes by the public administration while allowing the *datafication* and introduction of a positive disruption (change) of the processes, sometimes even their foundations, for the benefits of the citizens.

Not only the disruptive technologies are disrupting the established processes in the areas such as governance, politics, economics, law, culture etc. as well as the established processes and social function of the institutions, but the disrupted areas and the disrupted institutions will additionally disrupt each other thus magnifying the effect of disruption. **Both the disruptive technologies and the disrupted parties are affecting the society while policies are also influencing the disruptive technologies (enabling them or creating barriers for their use)** (Figure 1).
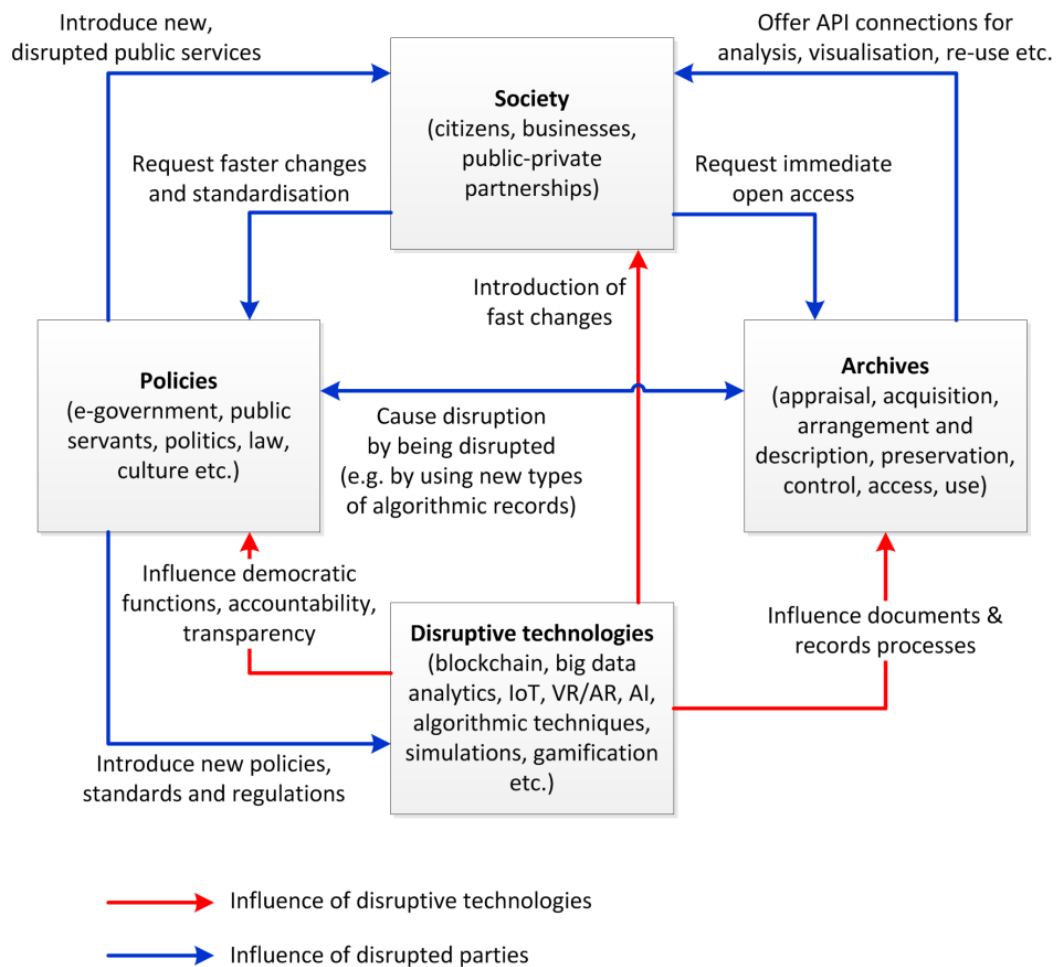
Figure 1. Influence of disruptive technologies

A typical process referring to the information, documents and records management in the public administration and businesses is shown in Figure 2.

The opportunities for implementation of disruptive technologies in the context of public administration e-services and the communication with the citizens can be mapped along **two axes: (i) process** (from internal to external) and **(ii) information** (from real time to management of collected information) as shown in Figure 3. Internally, public administration can benefit from establishing the reliable and trusted decision-making processes based on real-time information thus, externally, being able to promptly respond to the relevant events. Further, public administration can optimise internal processes by smart application of disruptive technologies while externally, by applying the same technologies, it can improve opening up and (re)use of information thus achieving transparency, creation of new value and facilitating trust in the democracy.
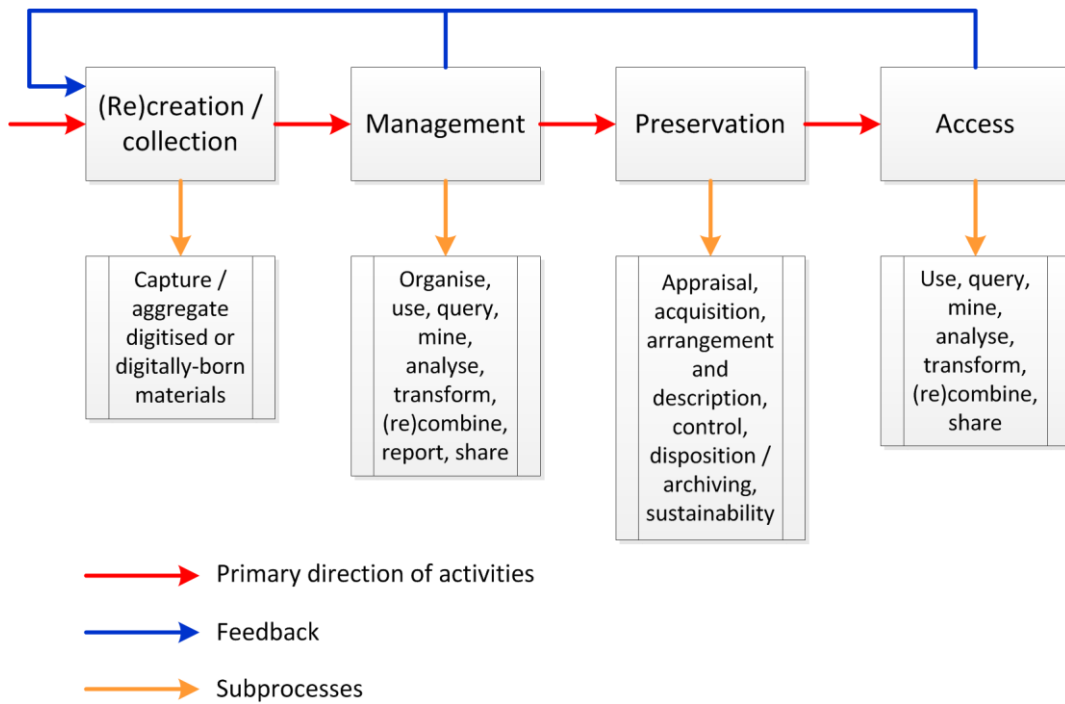
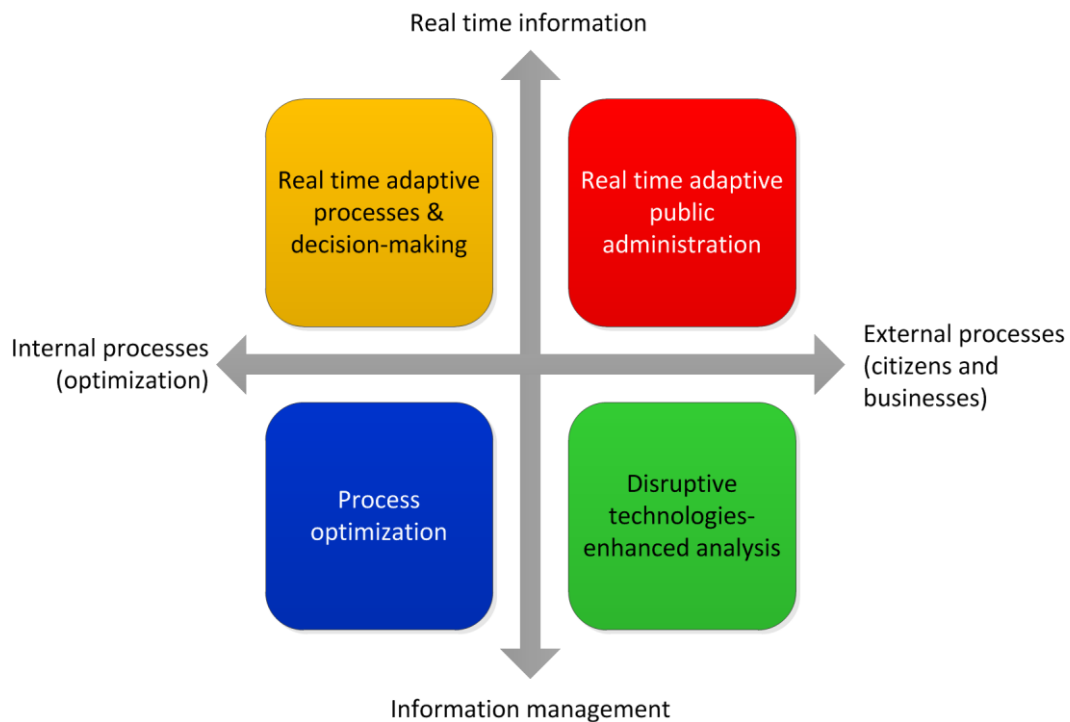Figure 2. Information, documents and records management process

Figure 3. The disruptive technologies opportunities for public administration[5]

The InterPARES Disrupt project will **rely on the findings of international research and innovation activities** which have already showed results in this field of research.

The **E-ARK project** (2014-2017) has developed CEF eArchiving building block providing specifications to tackle the challenge of short, medium and long-term digital information management and reuse in a sustainable, authentic, cost-efficient, manageable and interoperable way[6]. To achieve better understanding and utilization of the developed specifications this project has a representative of the E-ARK project (Kuldar Aas) as a member of the Advisory Board.

The InterPARES Disrupt project will rely on the roadmap and research directions developed by the **project SONNETS** (2016-2017). They represent an inclusive roadmap for the use of 23 emerging technologies with recommended activities guiding the transformation of the public sector and tailored stakeholder briefs (policy, research, technology) with both methodological as well as specific content-related recommendations. The roadmap summarizes the necessary technological and implementation activities that should be followed with a view to modernize the public sector using emerging ICTs and addressing, thereby, related societal challenges.[7] This project will utilize the already developed roadmaps for the disruptive technologies and build on top of them.

The InterPARES Disrupt project will investigate the **example of Estonia** which has proved to be the EU leader in the implementation of the public administration e-services. In order to gain a better insight this project has an Estonian expert (Raivo Ruusalepp) on the Advisory Board who has participated in development of the digital strategies on the national level for e-government services, data archiving and governance.

The InterPARES Disrupt project will rely on the results of the project **ARCHANGEL – Trusted Archives of Digital Public Records** (2017-2019) which proposed a shift to a technological concept of trust. It has developed a blockchain/DLT prototype using the Ethereum infrastructure to guarantee provenance, immutability and integrity of the archived public records. In order to be sure that the project will be able to fully understand the proposed concepts, the ARCHANGEL project partner – The National Archives – is a partner in this project.

The InterPARES Disrupt project will follow the recently initiated **project AI4EU** (2019-2021) which seeks to develop a European AI ecosystem, bringing together the knowledge, algorithms, tools and resources available and making it a compelling solution for users[8].

The InterPARES Disrupt project will also follow the two projects already funded under the same topic: Decentralised Qualifications' Verification and Management for Learner Empowerment, Education Reengineering and Public Sector Transformation (**QualiChain**; 2019-2021), and Digital Disruptive Technologies to Co-create, Co-produce and Co-manage Open Public Services along with Citizens (**CO3**; 2019-2021) in order to complement their results and avoid unlikely overlaps.

Outputs of these EU projects, outputs from previous InterPARES phases, and from **other research projects and innovation activities** that will be identified as relevant during the project research **will feed into the research** of the **InterPARES Disrupt** project both at the theoretical and at the practical level. On the practical side, the project aims to **pilot the use of the disruptive technologies** in the context of the public administration e-services providing the input for the analysis of their benefits and risks. Depending on the pilot, the project is aiming at the **technology readiness level (TRL) 5-7**. Based on the expertise and experience, the project partners estimate that at least TRL 5 can be achieved, i.e. to integrate the basic technological components so that the system configuration is similar to, or that it matches the final application in almost all respects. The lowest estimate is given because of the uncertainty of the use cases that will be recommended during the research. On the other hand, for the already indicated pilots, the partners are aiming to go beyond TRL 6, i.e. testing prototypes in the in a relevant environments where the step up from laboratory scale in TRL 5 is made to engineering scale and the determination of scaling factors that will enable design of the final system, to achieve TRL 7, i.e. to demonstrate the actual system prototype

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[6] eArchiving, https://ec.europa.eu/cefdigital/wiki/display/CEFDIGITAL/eArchiving

[7] Project SONNETS, https://www.sonnets-project.eu/content/results, https://www.sonnets-project.eu/content/sonnets-roadmap-and-research-directions

[8] Project AI4EU, https://www.ai4eu.eu/

in an operational environment where the final design is virtually complete and engineering and manufacturing risks are retired.[9]

1.3.2. Methodology

The InterPARES Disrupt project brings together a large interdisciplinary team consisted of researchers, experts in public sector business processes, information scientists and experts in the field of digital and disruptive technologies from both the EU and non-EU member states who will collaborate in carrying out a set of activities under 7 work packages.

For better understanding, the activities of the Action will be divided into axes related to the research, selection of use cases, application of technologies on the use cases, piloting and testing as well as impact assessment of disruptive technologies on a particular public e-service. The Action results will also be properly communicated and disseminated, in accordance with obligations arising from Grant Agreement and Regulation (EU) No 1290/2013 of the European Parliament and of the Council of 11 December 2013 laying down the rules for participation and dissemination in "Horizon 2020 – the Framework Programme for Research and Innovation (2014-2020)" and repealing Regulation (EC) No 1906/2006.

1. **Research on benefits, risks and the potential impact of disruptive technologies on a set of e-services and selection of use cases**

At the start of the Action, researchers from different knowledge fields will jointly conduct interdisciplinary studies of an impact and potential use of a particular disruptive technology for a **representative basket of 20 services** according to the *Digitizing Public Services in Europe: Putting ambition into action*, a 9th Benchmark Measurement by European Commission from December 2010. In this document, e-services are divided into two main groups: e-services for citizens (Government to Citizens – G2C) and e-services for businesses (Government to Business – G2B). **G2C group contains in total 12 services** that are available to the EU citizens (**income taxes, job search, social security benefits, personal documents, car registration, application for building permission, declaration to the police, public libraries, birth and marriage certificates, enrolment in higher education, announcement of moving and health-related services**). On the other hand, the **G2C group contains 8 e-services** that the governments give to the businesses on their disposal (**social contribution for employees, corporate tax, VAT, registration of a new company, submission of data to the statistical office and custom declaration, environment-related permits, public procurement**). This representative basket of 20 e-services will serve as a basis for identification of G2B and G2C e-services which could be ultimately enhanced by applying the disruptive technologies.

As part of the research process among the 20 e-services we will choose a minimum of 5 e-services for which an **in-depth analysis of processes and impact of disruptive technologies on these processes** will be conducted. This selection of services for the in-depth analysis will be done based on the collected data and application of set of criteria that we will define as part of **multi-criteria analysis methodology**. These criteria will at minimum include the following aspects: possibility of fast implementation of disruptive technology, reach of impact, cost-effectiveness. The focus will be on those services for which the impact of resolving bottlenecks in public service processes will be assessed as having the highest potential for improving inclusiveness, efficiency, transparency, accessibility and accountability.

The partners will, among themselves, form 5 focused study groups (SG) for **artificial intelligence and machine learning** (SG1-AIML), **big data analytics & visualisation** (SG2-BDA), **blockchain and Distributed Ledger Technologies** (SG3-B/DLT), **intelligent automation and algorithmic techniques** (SG4-IAAT), **simulation and gamification** (SG5-SG) investigating the disruptive potential of the emerging technologies.

At minimum the top 5 ranking e-services according to the applied methodology and the results of the study groups will be recommended for further analysis and piloting.

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[9] Technology readiness levels definitions and descriptions, Australian Government, Department of Defence, https://www.dst.defence.gov.au/sites/default/files/basic_pages/documents/TRL%20Explanations_1.pdf

2. **Application of disruptive technologies on information (re)creation, management, preservation and access**

Based on in-depth analysis of the application of various disruptive technologies on the processes of public e-services, we will conduct an **analysis of (potential) use, benefits, risks and social impact of application of disruptive technologies** to the selected e-services. The focus will be on how the disruptive technologies can improve the selected set of public e-services, and consequently on other services that incorporate the same or similar data, information, documents and records management processes. The use cases that will be determined as part of the research will be further elaborated and the possibility of using a particular disruptive technology (AI, big data analytics & visualization, blockchain, DLT and algorithmic techniques, intelligent automation, simulations and gamification) for information creation, management, preservation and access will be analysed. The analysis of the impact of selected disruptive technologies on an information flow through selected e-services will identify possible risks and opportunities that may arise after the activities of piloting and testing. Furthermore, an analysis of the impact of disruptive technologies in the processes of information appraisal and acquisition, ingest, description, preservation, access and use in the selected public e-service use cases will be conducted. In this way the challenges, opportunities, and potential synergies among all analysed disruptive technologies and e-services will be explored.

3. **Piloting and testing disruptive technologies on e-services that have been chosen as use cases**

Additional practical level of research of potential use, benefits and risks of disruptive technologies in public services will be done via **piloting**, i.e. implementation of disruptive technologies in selected use cases. At least 2 use cases will be selected out of the chosen set of the analysed 5 top ranking e-services. However, based on the initial preparatory investigation the partners were able to identify the three disruptive technologies appearing to be the most influential at this moment: 1) AI and big data analytics, 2) blockchain/DLT, and 3) machine learning (ML) and natural language processing (NLP). Therefore, the three pilots are already proposed – each relating to one of the recognized influential technologies. **These pilots, focusing on the technologies and further explained in WP4, will be relevant for the processes in all or almost all public e-services, while the pilots selected through the research will target specific e-services as a whole**. By taking this approach, the project will be able to achieve both vertical (technologies) and horizontal (e-services) alignment of the results. The Digital Hub, a platform brought to the project by the partner Dedagroup and further explained in the WP4, will be used as a common logical and technological infrastructure to guarantee consistent, measurable and comparable results of the piloting.

The infrastructure and the resources which are necessary for piloting and testing (public administration supporting partners and the contents of their repositories that will be used as an input in testing the disruptive technologies and e-services) will be evaluated and the piloting and testing will follow principles of the General Data Protection Regulation, (EU) 2016/679.

The research methodology explained so far is shown in figures 4 and 5.

Step 1: Current state analysis of representative basket of 20 selected e-services
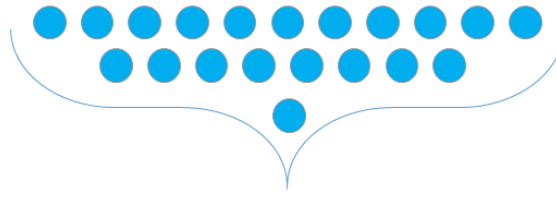
Step 2: Selection of at minimum 5 e-services as use cases for in-depth research based on multi-criteria methodology

Step 3: Breaking down the 5 selected use cases to processes

Step 4: Research of application of disruptive technologies on processes of selected use cases
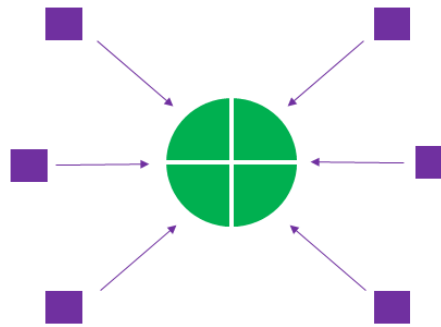
Step 5: Selection of at minimum 2 e-services for piloting based on research results from Step 4

Figure 4. Selection of e-services for piloting based on project research results

Pilots focused on chosen e-services	Pilots focused on processes present in all or almost all public services
Application of disruptive technologies which arise from the project research	Application of 3 currently most influential disruptive technologies

Figure 5. Types of pilots

4. Assessing and evaluating the impact of disruptive technologies on public e-services

Based on results of data collection, analysis of processes and piloting a conclusion will be made about potential **use, benefits, risks and social impact of the disruptive technologies in public e-services** as well as about impact of the disruptive technologies on public administrations, citizens and businesses.
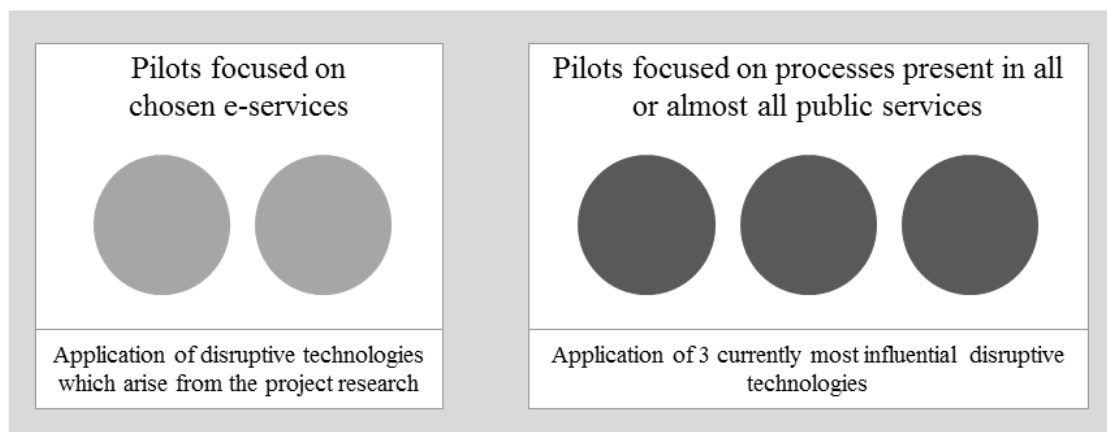
The purpose is to practically assess the costs and benefits of implementing disruptive technologies of provision of public e-services as well as to develop plans and recommendations for further implementation of disruptive technologies in the public sector. Furthermore, surveys and assessment models for assessing social impact will be developed to investigate the benefits for public administration, citizens and businesses that arise from implementation of disruptive technologies. As part of the assessment of the social impact it is also important to take into account the issues related to data protection. Therefore, the project results that might involve personal data will follow principles of the General Data Protection Regulation, (EU) 2016/679.

Best practices and policy recommendations for domain-based implementations of public e-services in the context of disruptive technologies will be defined.

5. Communication and dissemination of Project results

During the whole project, findings and results of the activities will be shared among the partners, key stakeholders and general public via production of reports, organization of workshops and conferences as well as via press releases and additional information that will be published on the website of the project and the partners. Dissemination of research results will follow the rules for intellectual property rights, the security and data protection rules, but also implementing either "green" or "gold" open access publishing model. **The project will take the "open research data by default" approach**.

All dissemination of project results will be done in accordance with obligations that arise from the Grant Agreement and Regulation (EU) No 1290/2013 of the European Parliament and of the Council of 11 December 2013 laying down the rules for participation and dissemination in "Horizon 2020 – the Framework Programme for Research and Innovation (2014-2020)" and repealing Regulation (EC) No 1906/2006. Any publications or other online and offline dissemination materials will include a statement and visual means that the project has been financed by the EU funds. Furthermore, development, continuous update and submission to the EC of the Data Management Plan that will contain information on types and handling all research data, as well as methodology and standards used during the research process will serve as an overview and guideline for further steps in the research activities.

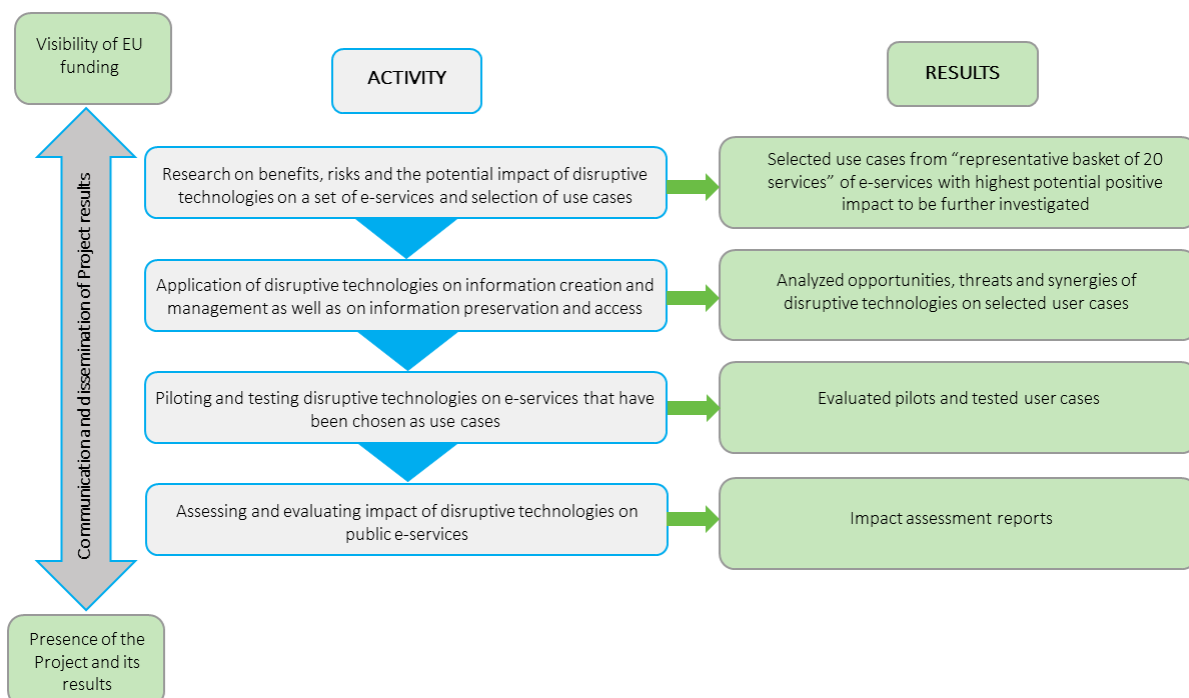Figure 6 depicts the outlined activities and results.

Figure 6. Main project activities and results

The InterPARES Disrupt project is focused on conducting of research activities and offering new solutions to the public authorities that they could implement in their public services. During the process of assessing and evaluating social impact of disruptive technologies on the provision of e-services, **the gender dimension** will also be considered. As part of the analysis it may be found out that the project results could have different impact on men and women. The possible difference will be taken into account and adequately addressed.

As part of the impact assessment under WP6 a set of surveys will be conducted. Project partners will make sure to define a proper sample for survey results to be relevant. This includes respecting the gender balance within the survey groups.

1.4. Ambition

1.4.1. Introduction and rationale

Over the next 2-3 years, the government or the public sector is expected to be impacted by the evolving technologies and they quickly need to adapt to these technologies to remain efficient, transparent, accountable, and user centric. These emerging technologies have the potential to disrupt the traditional way of operations and delivery models across functions and domains by the government organizations. New digital technologies offer possibilities for strengthening public administration (PA) through more efficient and effective service delivery and enhanced public-policy making but they are also 'disruptive' in that they challenge and modify existing norms, institutional behaviours and practices (UN, 2017). However, despite the investments performed in the last decade in the field of public sector modernisation and automation, the bitter truth is that "we are not there yet" when it comes to fully exploiting the benefits of ICT for governance towards aiding the public sector to meet the new societal needs that are emerging. Moreover, it was typical for the public sector to adopt existing approaches and technologies with long track records in other domains, thus the process of promoting innovation was practically non-existent.

Therefore, there is an urgent need for better, more efficient, effective and quality delivering public services. A need that will not only transform the public sector itself and cover the needs of public sector employees and policy makers, but that will also cater for citizens and businesses, thus benefiting all stakeholders and opening new innovation directions that will in turn accelerate the EU economy and will improve quality of life, powered by a renovated public sector that will be in the position to play a central and active role in innovation diffusion and technology take-up (SONNETS, 2019).

The project will build on previous research and knowledge and progress further to ensure ultimate and effective results. The first important aspect when dealing with the notion of disruptive technologies is to examine the existing emerging technologies and focusing on those most likely to disrupt the field of public e-services.

1.4.2. Background research in identifying key emerging technologies

A 2017 UN E-Government EGM Meeting Background Paper on Emerging Technologies in the Public Sector lists Key Emerging Technologies Impacting the Public Sector (Figure 7) based on the relevant studies (UN, 2017).

Policy paper published by the UK Government Digital Service (2018) on technology innovation in government found that disruptive technologies such as AI and distributed ledger technology are most popular among emerging technologies in government, as they have potentially wide-ranging process, policy and regulatory impacts on automation, identity, decision making, privacy, security and trust.

In a poll conducted by the United Nations Development Programme (UNDP), experts and policymakers identified four technology clusters to be of particular relevance for the implementation of the Agenda 2030: (1) Electronic Identity (EID), Trust, Cybersecurity, and Distributed Ledger Technology (DLT); (2) Digital Connectivity and Infrastructure; (3) IoT and Smart Infrastructures; and (4) Big Data, Analytics, and AI. Among these clusters, the IoT, AI, and DLT (or the "blockchain"), in particular, were singled out by conference participants as the technologies with the most significant disruptive potential, a view shared by many technology industry analysts (Leitner and Stiefmueller, 2019).
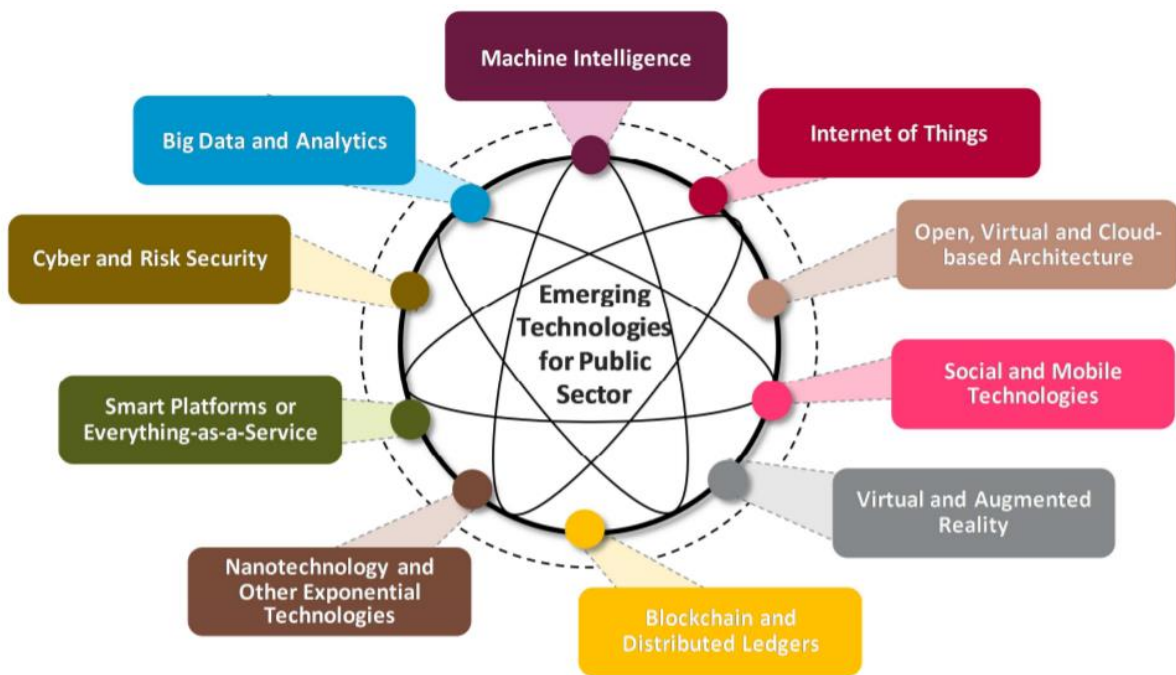
Figure 7. Key emerging technologies impacting the public sector (UN, 2017)

Report released at the World Government Summit (Dubai) titled "Best Government Emerging Technologies" (Indra, 2017) identified the most relevant emerging technologies in the area of digital solutions within government organisations around the world, by surveying a panel of experts in a variety of digital technology fields and digital solutions. The report analysed and identified 29 Emerging Technologies, grouped in 9 categories that include technologies such as Artificial Intelligence, Blockchain, Cloud Computing, Robotics & Space, Smart Platforms, amongst other. (Figure 8)

Figure 8. Selected cutting-edge technologies that can be applied in digital solutions
used by public bodies (Indra, 2017)

1.4.3. Technical and societal challenges of key emerging technologies

Existing SONNETS project, dealing with emerging technologies in the public services, published a roadmap and research directions (SONNETS, 2017) that summarize the necessary technological and implementation activities that should be followed with a view to modernize the public sector using emerging ICTs and addressing, ther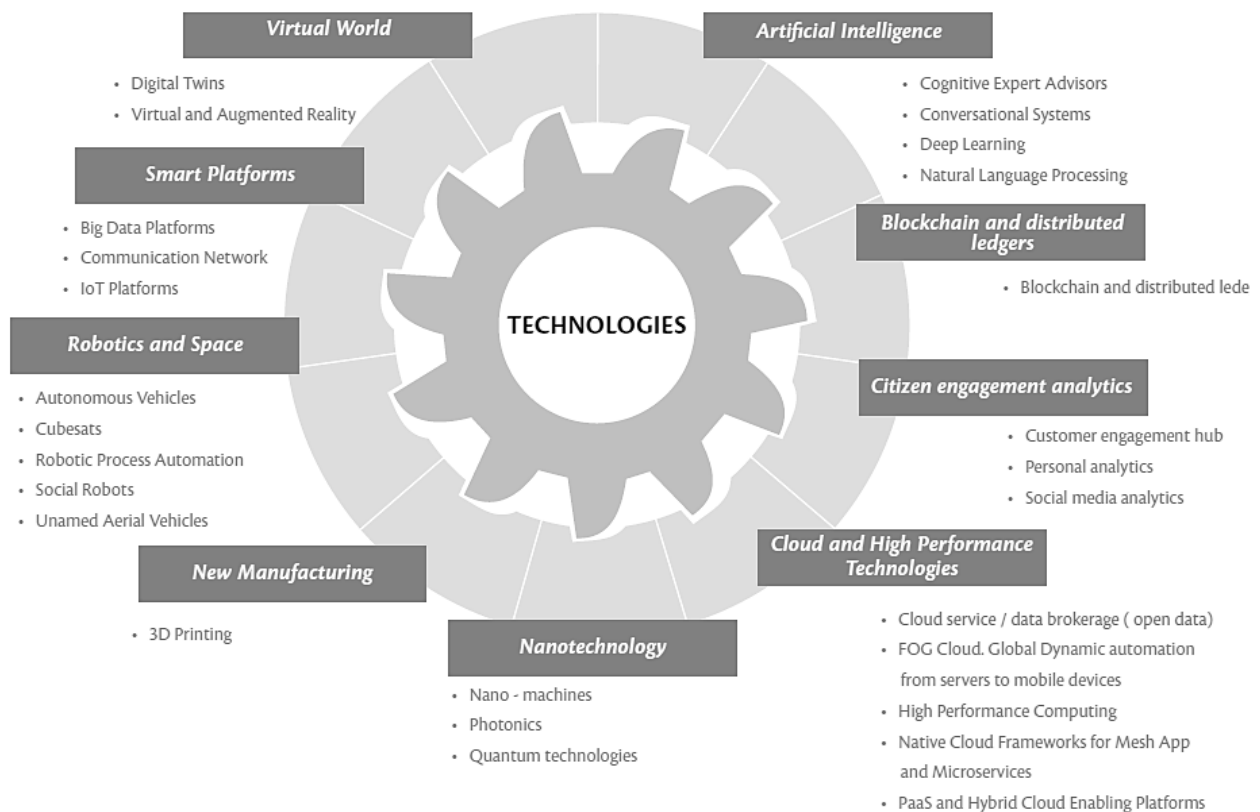eby, related societal challenges. As stated in the SONNETS project there are numerous open questions concerning disruptive technologies that are challenging traditional governance patterns and modes of operation.

Building on those open questions, the InterPARES Disrupt project aims to identify potential use, benefits and risks of wide range of disruptive technologies on all parts of public service process cycle. Furthermore, by giving recommendations for implementation of appropriate disruptive technologies in public administration e-services which face most serious bottlenecks, the InterPARES Disrupt project is contributing to exploration of new forms of innovation and understanding how forms of innovation are developed, succeed or fail. Based on the findings of the SONNETS project, the following provides the technical and societal challenges this project aims to address.

Artificial intelligence for better access to public sector information

Artificial Intelligence (AI) is intelligence exhibited by machines. In computer science, an "intelligent" machine is ideally a flexible rational agent that perceives its environment and takes actions that maximize its chance of success at some goal. Colloquially, the term "artificial intelligence" is applied when a machine mimics cognitive functions such as "learning" and problem solving. Artificial intelligence is one of the top emerging technologies in which a lot of research and development is happening right now. Capabilities include Machine Learning/Deep Learning, Virtual Personal Assistants, Cognitive Expert Advisors, Smart Data Discovery, Conversational User Interfaces, Natural-Language Question Answering, etc. Although AI has been rapidly advancing and will provide benefits through enhancing citizen engagement, automating workloads, and increasing workplace productivity, there are still many open technical and societal questions remaining to be answered SONNETS, 2017).

The InterPARES Disrupt project aims to address the following challenges in particular:

- **Technical challenge** advancement in natural language processing (e.g. regarding local language, resolution of semantics and pragmatics issues, development of language-specific dictionaries, development of efficient, large-scale solutions); advancement in the learn and reason of artificial intelligence systems, as they encounter new tasks and situations, implementation of chatbots; cyber security issues; data availability and reliability; providing unbiased and quality sets of data upon which machine learning systems are to be trained;

- **Societal challenges**: a need for well-educated and trained personnel, a long-term plan regarding the future of the current personnel (new tasks and/or positions, change management); promotion and dealing with public acceptance, issues, the area of ethics, liability, intellectual property, security, privacy, dignity and autonomy; user training in order for machine learning applications to produce reliable results; cultivate expertise in data science and related fields to effectively analyse text/speech and build efficient models and ontologies.

Blockchain technology for transparent access and governance in public services

Blockchain is a peer-to-peer software technology that protects the integrity of digital information. It is a type of distributed ledger or database in which value exchange transactions (in Bitcoin or other token) are sequentially grouped into blocks in an append-only manner (the data in a block cannot be altered retrospectively). Each block contains a timestamp and is chained to the previous block and immutably recorded across a peer-to-peer network, using cryptographic trust and assurance mechanisms.

There are many possible ways that blockchain can make government more accountable, transparent, efficient and fraud-proof, which include contract management, electronic voting and health care just to name a few. A prominent country which has already several applications of blockchain technology in use is Estonia. However, despite these pilot projects blockchain technology is still in its infancy, so that there are still unknown factors and vulnerabilities (SONNETS, 2017)

The InterPARES Disrupt project aims to address the following challenges in particular:

- **Technical challenges:** to provide a balance between privacy and confidentiality on the one side and transparency on the other side; address challenges such as transaction speed, the verification process and data limits; to investigate situations in need of high-performance, low latency operations; to ensure that distributed ledgers are scalable, secure and provide proof of correctness of their contents; to ensure high level of cryptography is applied; address cyber security issues (e.g. Sybil-attacks and distributed denial of service attacks) and provision of IT infrastructure (cloud computing solutions);

- **Societal challenges**: the need for recruitment or training of the public administration personnel in blockchain technology, to use blockchain-as-a-service, to develop the strategy for public sector processes towards placing trust and authority in a decentralized network; to examine legal issues arising from the use of blockchain technology in the public sector on governmental level.

Big data and data analytics for faster and effective use of public records

Big Data is a term for data sets with sizes and complexity beyond the ability of commonly used software tools to capture, curate, manage and process data within a tolerable elapsed time. Big data is high volume, high velocity, and/or high variety information assets (the 3Vs model) that demand cost-effective, innovative forms of information processing that enable enhanced insight, decision making, and process automation. The term often refers simply to the use of Big Data Analytics to collect, organize and analyse large sets of data to discover hidden patterns, unknown correlations and other useful information. Data Analytics refers to the discovery, interpretation, and communication of meaningful patterns in data, based on the simultaneous application of statistics, computer programming and operations research to quantify performance. It further often favours data visualization to communicate insight. The goal of Data Analytics (big and small) is to get actionable insights resulting in smarter decisions and better business outcomes. Data Analytics can be descriptive (explaining in more detail a phenomenon which is represented with the data), predictive (trying to forecast the future behaviour of a system for which past and present data is available) or prescriptive (targeting the prediction of the impact of the behaviour of a system in a future scenario). Data analytics are closely related with Big Data, as the advert of the latter propelled the rapid development of novel analytics methods, capable of handling bigger data loads and of providing more evidence-based results with less uncertainty due to the bigger data samples available. Big Data technologies will definitely open new opportunities and enable breakthroughs within the domain of public records (SONNETS, 2017).

The InterPARES Disrupt project aims to address the following challenges in particular:

- **Technical challenges**: data quality and cleaning of data (e.g. from private information), data quantity (dealing with the large volume and high velocity of data; including new data sources), data access (to different isolate data silos), analytical methods (constantly improve and update existing analytical methods), also addressing the issues of interoperability across the big data value chain;

- **Societal challenges**: personnel with sufficient technical expertise, digital training and education programs, strategic changes for public service administrations to take the data driven approach, dealing with issues regarding the acceptance of big data/data analytics in everyday decision-making, regulations regarding the privacy and security of data.

E-participation for participative access to public services

E-participation refers to the ICT-supported participation in processes involved in government and governance. Such processes may concern administration, service delivery, decision making and policy making. E-participation is hence closely related to e-government and e-governance participation (SONNETS, 2017).

The InterPARES Disrupt project aims to address the following challenges in particular:

- **Technical challenges**: ensuring anonymity or real name policies; the challenge of fake profiles; improvement of user-friendliness & user-experience; designing an appealing and yet simple, attractive and easy to use system;

- **Societal challenges**: creating a transparent and accountable process in order to guarantee that the opinions of the citizens are taken into consideration in the policy process; encouraging citizens to participate: cyber security issues (prevent manipulation by organized groups, privacy, data

protection, confidentiality, secure system); develop guidelines for safe and acceptable use of e-systems and public administration e-services.

In general, it can be observed that the main challenge regarding the use of e-participation technologies to promote the political participation of the citizens is not a technical but more of a societal one. There are two connected trends in ICT-supported approaches possible to tackle the e-participation of both civil servants and citizens: crowdsourcing and gamification.

a) Crowdsourcing for civil servants as a community of change

Crowdsourcing, a combination of the words 'crowd' and 'outsourcing', is a specific sourcing model, which describes the processes for sourcing a task or challenge to a broad, distributed set of contributors using the Web and social collaboration techniques. By definition, crowdsourcing combines the efforts of numerous self-selected volunteers or part-time workers; each person's contribution combines with those of others to achieve a cumulative result. Crowdsourcing applications typically include mechanisms to attract the desired participants, stimulate relevant contributions and select winning ideas or solutions. Currently, crowdsourcing applied in the public sector refers to obtaining needed services, ideas, or content by soliciting contributions from a large group of people, especially an online community, rather than from employees or suppliers. This means that the government can set up microtasking platforms, not just for citizen engagement, but also as a way to harness the knowledge and skills of its own public administration personnel across multiple departments and agencies (SONNETS, 2017).

b) Gamification for employee remuneration and incentives

Gamification is the use of game mechanics to drive engagement in non-game business scenarios and to change behaviours in a target audience to achieve business outcomes. Many types of games include game mechanics such as points, challenges, leader boards, rules and incentives that make game-play enjoyable. Gamification applies these to motivate the audience to higher and more meaningful levels of engagement. Humans have a clear tendency to enjoy games and naturally interact more deeply in activities that are framed in a game construct (SONNETS, 2017).

The InterPARES Disrupt project aims to address the following challenges in particular:

- **Technical challenges:** Working remotely from different locations poses a major security risk, virtual team members could be accessing sensitive information from their homes or from a public Wi-Fi network; gamified processes generate a track record of employees' achievements and the collection and use of personally identifiable data.

- **Societal challenges:** training focused on social and collaborative processes in a distributed workplace to broaden public employees' skills and the ability to handle multiple tasks and work on a variety of projects; implementing changes to current human resource norms focusing on flexible work arrangements; designing a solid and user-centred gamified process (fun scenario building a genuine sense of competition), promoting acceptance to voluntary gamification approaches in internal processes.

1.4.4. Beyond the state-of-the-art

The project will go beyond the state-of-the-art of the technologies used today in the public administration by **application of the disruptive technologies to the seemingly unsolvable problems**. For example, today public administration e-services cannot distinguish between the two copies of the same digital document and claim that one is the original and that the other is a copy. This project will investigate ways to make it possible, i.e. to be able to manage digital documents and the rights coming out of the fact that a person is holding an original or is entitled to the rights coming out of that fact, or that those rights can be withdrawn by the issuer. This kind of invention can eliminate the problem of proxy paper handling or centralised solution for an individual government authority.

The long-term preservation of the digitally signed records required to be held by the public administration and expected to be trustworthy rely on the validity of the signing certificates. However, they expire within 2 to 5 years which is too short period in the context of long-term preservation. One could constantly wrap archival time stamp around the document, as suggested by ETSI EN 319 102-1 Procedures for Creation and Validation of AdES Digital Signatures (Part one: Creation and Validation), but in large repositories holding

millions of documents it would be impractical. The project will pilot a novel blockchain-based solution to that challenge relying, in part of the integrity verification, on the patent, held by the project partner Enigio Time, US10146825B2 Method and system for providing a way to verify the integrity of a document.

Today the citizens expect to be provided with the relevant, reliable and timely information from the public administration. The distributed and networked nature of the information providers calls for the novel approaches to **automated conception of a coherent digital record from distributed administrative sources** using AI-based solutions to achieve intelligent automation and deliver as expected.

The vast amount of data, information, documents and records are collected by the public administration. Almost too often the amount is unsurmountable by applying traditional, state-of-the-art procedures. For example, personal information redaction requires not only detection of the personal information in order to release the anonymized document to the public, but often requires understanding of the context. Named entity recognition, natural language processing, machine learning and AI principles need to be combined to achieve this seemingly easy, but actually very challenging task. This project will go beyond the state-of-the-art and address this kind of issues related to the public administration which could be effectively solved only by application of disruptive technologies.

Results of the research will **challenge current, well-established theories and practices** of data, information, document and records management but will not stay only on the theoretical level – the pilots achieving TRL 5-7 guarantee the tested solutions will be developed nearly to the commercial level. If implemented by the public administration, the results will enable creation of the updated and more efficient e-services and new public administration organizational models.

2. Impact

2.1. Expected impacts

The InterPARES Disrupt project contributes to the expected impacts of the work programme for the topic "DT-TRANSFORMATIONS-02-2018-2019-2020: Transformative impact of disruptive technologies in public services". **With activities that will be performed and results that will be achieved, the project will have an impact on public administrations, citizens and businesses**. Table 3 contains Project's contribution to a particular expected impact as listed in the work programme of the above-mentioned topic.

Table 3. Contribution of the InterPARES Disrupt to the work programme's expected impacts

Work Programme Expected Impact	InterPARES Disrupt contribution
Enable public authorities to develop pathways for introduction of disruptive technologies	The InterPARES Disrupt project aims to explore the existing and emerging disruptive technologies in the context of public services. The project will study processes in public services (G2C, G2B) and identify their challenges. **The results of analysis of potential use, benefits and risks of disruptive technologies in public services will serve as pathways for public authorities to introduce disruptive technologies where that is assessed appropriate in the public administration**. Furthermore, by selecting e-services as use cases and ultimately piloting and testing them, we will obtain concrete results of implementation of disruptive technologies in public services. The project results will be available to public authorities and this information may be used in other institutions and the EU countries as well, even in non-EU countries, institutions and international organisations.
Address societal challenges raised by disruptive technologies	Disruptive technologies bring many benefits, but they also may cause different challenges. Societal challenges such as issues related to personal data breach, rejection of disruptive technologies by general public and public servants are significant to consider since they impact life of the EU citizens. Introduction of a new process, new technology or simply change of already established state and practices can cause rejection or misunderstanding from the existing users. Public servants (who are in charge of provision of e-services), citizens and businesses (end users of e-services) could have problems with accepting changes or with adding new functionalities to e-

	services that may be proposed with this project. Therefore, an evaluation and impact assessment will be carried out. **A set of surveys and assessment models will be carried out in collaboration with the parties who will ultimately use and benefit from the use of disruptive technologies in e-services. In this way all potential societal challenges will be taken into account and timely addressed**. As a final result of the project, a report containing an analysis of socio-economic, legal, political and cultural aspects of disruptive technologies will be prepared.
Enhance knowledge on digital democracy	This project will raise awareness and knowledge on how the disruptive technologies may be used to enhance provision of e-services. The results of research, piloting and testing will be disseminated and shared with public administrations and citizens to convey the knowledge that has been obtained during the project implementation. This information will be useful for further development of digital democracy since this project will serve as **a benchmark for any other party that is interested in giving proposal for enhancing public administration**. Another dimension of the project will address digital democracy concerns related to the **access to information for wider public and citizens**. This is particularly important having in mind that public opinion is formed based on available information, ideally reliable or coming from the reliable sources, and that by applying the disruptive technologies citizens may become more involved in public e-services realization.
Develop new ways of providing public services	Some public administrations still do not use any type of digital technologies in provision of their public services even though these technologies may facilitate their running. On the other hand, public administrations that already use some types of disruptive technologies exist throughout the EU, but may not have the e-services developed to their full potential. All these already existing practices will be analysed and compared to results of the InterPARES Disrupt project. The outcome will contain risk and benefit analysis of these processes as well as examples of best practices and lessons learned. The analysis conducted under the project will also result in **proposing alternative disruptive technologies that may be more suitable for some processes conducted for provision of public services**. Identification of use cases and application of particular disruptive technology in the piloting and testing phase will serve as a basis for potential **development of new ways of providing public services**, as well as testing their impact on provision of public services.
Ensure public governance	The role of every government is to establish rules, regulations and delivery of services to its citizens. It is in the interest of both the governments and the citizens that these services are of a high quality and that they are useful for the purpose they have been developed for. The InterPARES Disrupt project will contribute to ensuring public governance since it will propose new ways of enhancing the existing e-services and potential integration of new processes that would be useful for the citizens. **The project will also contribute to the good public governance principles: transparency by enabling open communication about actions and decisions by using disruptive technologies, participation where the citizens could give their opinion and contribution to improvement of e-services and their responsiveness since the use of disruptive technologies in public sector services enables public servants to timely address the needs of the public**.
Boost public engagement with help of disruptive technologies	Citizens and governments have not been close in the past as they are nowadays because now they have on their disposal different types of digital technologies that enable their interaction and facilitate their communication. Unfortunately, many public authorities still do not use these technologies in an extent that would bring additional value to the public engagement in the decision and policy-making. **Disruptive technologies that will be researched under this project are expected to result in faster collection**

	and sharing of information, more accessibility to information for general public and more transparency. Exchange of information between citizens and public administrations should be enhanced as the interaction process will be facilitated, more and more people will be willing to use these services. **The project will investigate models for the citizens' e-participation using disruptive technologies.**
Develop new practices	This project will examine and develop new practices of using disruptive technologies in public e-services. **Activities of research, piloting, testing, and impact assessment will result in the development of new practices and provide recommendations for application of specific disruptive technologies for provision of public services**.
Optimise work processes	Implementation of disruptive technologies may significantly optimise work processes. This project will analyse **benefits and risks of using disruptive technologies in public e-services in order to identify the best disruptive technologies for the best provision of public e-services**. In case the benefits will outweigh the costs or the risks, a particular disruptive technology will be recommended to optimise work process of e-services.
Integrate evidence-based decision-making processes in public services (and in services like health, education, social welfare, mobility)	The results of this project will be disseminated and shared with the public administrations and general public. Optimisation of work processes, provision of services and ultimately decision-making in the public sector shall be evidence-based and not opinion-based. One of the expected results of this project are conclusions and recommendations for improvement of public service processes, including data collection and access – **by enabling an open access to recent, well-structured and correct data, decision-makers can form their policies on sounder grounds and analyse various policy impact scenarios.** The public administrations and government will in this way have continuous and fast access to evidences which can enhance all public services, including health, education, social welfare and mobility.

Besides the expected impacts listed in the work programme provided above, the project will contribute to other areas that are described in the Table 4.

Table 4. Contributions of InterPARES Disrupt project to the additional areas of impact

Area of impact	InterPARES Disrupt contribution
Boosting innovation capacities in the public sector	Public sector is widely known as a sector that is too bureaucratic and complex and therefore does not offer space for innovation. The InterPARES Disrupt project will show that innovation is possible also in the public sector. **The results of the project may serve as a starting point for the further implementation of disruptive technologies in public services, since it will provide measurable evidence of impact of disruptive technologies on various levels**.
Strengthen collaboration between citizens and governments	Disruptive technologies may strengthen collaboration between citizens and governments. The project will investigate e-participatory models for collaboration of citizens and governments based on the disruptive technologies. In this way, the InterPARES Disrupt project will establish a basis for a stronger relationship between citizens and public administrations that may be further developed in the future.
Enable public authorities to follow the newest technological trends	The results of this project will enable public authorities to optimise and enhance their services by implementing disruptive technologies. All disruptive technologies and their respective forms that will be analysed under this project will be up to date and will follow the newest technological trends. **The public authorities that will embrace them will make their services modern and will keep up with the technological trends and implement the cutting-edge technological solutions.**

Achievement of the expected impacts may be challenged by possible barriers or obstacles that may arise during the implementation of the InterPARES Disrupt project.

The project team has identified and analysed these possible obstacles already in the project preparation phase and will make sure to monitor them throughout the project implementation by using the **Project risk register**.

- **Complexity level and different regulation standards between the countries**

Many countries and different ways of provision of public services imply the existence of different national regulations and attitudes towards disruptive technologies. Once the final project results have been disseminated, existing national laws and procedures or existing national procedures for adoption of new regulatory and strategic documents may slow down the processes of potential implementation of disruptive technologies, changes of already existing or introduction of new business processes for provision of public services.

- **Public acceptance**

Public servants and citizens (especially the ones who are sceptical towards digital technologies) may refuse to use already existing services in a new way. Some public servants may be afraid that their professional services and the added value that they may bring to their employer will no longer be necessary since they may be replaced by the disruptive technologies. This fear from losing their job may emerge in rejecting the introduction of changes in public services provision. On the other hand, the general public may fear from possible breaches of their personal data and may prefer the former established ways of public services' provision.

- **Financing of recommendations and new practices developed under the project after the project's end**

Any change or implementation of new processes by using disruptive technologies can be very costly. Governments already struggle with tight state budgets and any additional expense represents a burden to both the state budget and the citizens. However, the EU heads towards the digitization of services provided in its member states and encourages them to embrace the Fourth Industrial Revolution. The governments may be willing to consider loans or any other financial instruments that would enable them to implement disruptive technologies in the provision of their public services.

The InterPARES Disrupt project will tackle these obstacles through communication, dissemination and education activities which will also send a clear message about identified benefits of disruptive technologies in public e-services, about importance of cross-border cooperation which requires harmonization of national regulation and standards (especially within the EU). In this way both governments and end users can have time to embrace disruptive technologies and be ready to implement them.

Cooperation of citizens in the project is of a high importance since they are the end users of the public services. Therefore, with dissemination events and assessing the societal impact we plan to raise awareness about the importance and benefits of disruptive technologies in public services.

2.2. Measures to maximise impact

2.2.1. Dissemination and exploitation of results

The dissemination strategy will optimize the project promotion and ensure that the project results will reach a large and diverse audience. Dissemination will focus on the following key components as detailed within the WP5 (Communication, Education and Knowledge Dissemination) and WP6 (Self)Evaluation and impact):

1) Set an **exploitation and communication strategy** to ensure high level outreach within the community of potential users and stakeholders (Task 5.1.)

2) **Effectively share results** and related information among interested parties and external stakeholders for establishing and **maintaining visibility** for project and EU funding (Task 5.2., Task 6.3.)

3) Manage any Intellectual Property Rights issues and identifying knowledge to be potentially protected and disseminated in consistency with the European ethical principles or security considerations by establishing **mechanisms to manage project assets** (Task 5.3.)

4) Raising public awareness on the project, its results and progress within defined target groups developing and **delivering of open access** materials (Task 5.4.)

5) **Exchange experience** with projects and other relevant actions working in similar or complementary domains in order to join efforts, minimize duplications and maximize final impact by creating a **dissemination plan that will include a knowledge management and protection strategy** in order to achieve maximum dissemination effect (Task 5.5.)

An appropriate consortium agreement will be put in place early on in the project to outline issues of **IPR** and the potential for ongoing commercial exploitation with regards to the specific technological solutions and prototypes being developed in work package 4. The amount of data limited by such an agreement will be kept to a minimum, and the aim will be to make the research outputs as open as possible. The activities, project results and products of the pilots will be regularly monitored by the Steering Committee for protection of IPR and possible exploitation all the time ensuring the consistency with ethics, security and protection of personal information principles.

The areas in which this project is expected to make an impact are dependent on the specific use cases selected (Task 1.3.). Following the selection of these use cases, four workshops (M12, M18, M24, M30) will be planned, in four different countries (countries of origin of project partners), in order to bring together relevant stakeholders with the research team to understand and build for impact around the project's experimentation with disruptive technologies. Participatory research methods will be employed leading to the co-creation of some of the research outputs with those on whom the use of these technologies will impact. The project will broadly categorise these stakeholders as a) those working in public administrations, b) citizens interacting with public administrations, and c) recordkeeping practitioners whose role is to mediate the creation and preservation of the data and information used in and arising from these interactions.

By facilitating dialogue between these three constituencies, the project will deepen its impact beyond the development and evaluation of specific technological solutions. Instead it will also **boost public engagement** with questions of digital democracy and trust between citizens and public administrations. Disruptive technologies will not be presented as an incomprehensible force that will be imposed on both public servants and citizens alike, but rather as something to be explored and understood together, with the support of the research team.

Highlighting recordkeeping practitioners as an important stakeholder group shows that this project will consider the impact of disruptive technologies over the long term. It is vital that any technological solutions put in place do not threaten the sustainability of an open and trusted public record on which all citizens are willing to rely. Without access to such a record, trust in public administrations, democracy and government will be severely undermined and its potential loss when implementing disruptive technologies must be considered and guarded against.

Through its participatory methods, the project will slowly build a community of interested and informed individuals. During the last six months of the project, as part of **legacy building** (Task 6.5.), this community will be consulted in order that the research outputs are positioned in such a way as to ensure their long-term preservation and ongoing development by the relevant stakeholders. Most of the data to be generated/collected during this project will be qualitative in nature (evaluation reports, educational and informational resources such as bibliographies, best practice and policy recommendations). The best way to preserve this data is to work with stakeholders in the ways outlined above in order to ensure that it is created in a form that best suits their needs and in which they will be able and willing to take ownership beyond the end of the project. The final conference planned as part of Task 5.5. will not just report on the results of the project, but also seek to **facilitate ongoing communication between the community of stakeholders** which has been built up and future research in this area.

One of the main project results will be **recommendations for implementation** of disruptive technologies in public services, including possibilities and hints for **further research and testing** in this field. In such way, this project will create concrete suggestions of activities to ensure the **follow-up and scaling up of project results**. Apart from concrete suggestions for wider deployment of proven concepts, open access to project results will enable researchers, businesses and governments to further examine InterPARES Disrupt research

areas and use them as **basis for next step research**, wider testing or **deployment of innovative solutions** in public services.

On the technical side, the project will implement (i) a repository for the data collected and created primarily by the work package 1, but other WPs as well (research data), (ii) the website and social media presence for communication of the project results, community engagement and taking participatory actions, (iii) open digital learning platform, based on OLAT (Online Learning and Training), and (iv) technological solutions for the pilots. The infrastructure of the partner responsible for the development and maintenance of those solutions (University of Macerata) is appropriate. The piloting process will use Digital Hub (a solution brought to the project by the partner Dedagroup) and the results of the tests will be stored and preserved there for comparison, benchmarking, analysis and future access. The **regular backups** of the content and solutions in both systems will be performed following the 3-2-1 principle. At least 3 copies will exist (original and two backups) using at least 2 different media and at least 1 copy will be offsite. The file formats will be **proactively monitored** and the content will be **converted** to the new formats if the old formats will be threatened to become obsolete. This will be done in a planned way and the possible conversion paths will be piloted using a representative set of data for making a decision on the best path to take and then applied to the actual data. If the conversion will be performed, extra measures will be taken to make sure that the converted data stays authentic, reliable, and useable with the integrity intact and the context preserved. The original metadata, along with the metadata about the process of conversion (technical metadata), will be preserved along with the converted data in the new file format. **Versioning** will be applied to the converted data so that the users understand that they are accessing the converted resource. On the other hand, document versioning will be performed for the content created by the project partners in cases where this is relevant, e.g. development of formal project outputs like deliverables and reports.

The **cost of** performing the outlined measures for **data curation and preservation** are included in the budget. Taking in account that the partner responsible for hosting of the project's overall production has a server farm implemented, the overall filesize of the project production in comparison to the space available will not amount to a significant size. Therefore, the cost of space for storing the project results after the end of the project will be insignificant. Nevertheless, the consortium agreement will cover storage and preservation of the project results after the end of the project to make sure that the project results remain accessible. If needed, alternative pathways for storage and preservation will be investigated.

InterPARES Disrupt will create different kinds of results and some of them will have **marketable value**:

1. Online repository with collected primary and secondary sources on disruptive technologies – of a short-term academic value and will be made **open**.
2. Generic documents (e.g. communication strategy and action plan, data management plan, dissemination plan, quality management plan, risk register, assessment methodologies and metrics) – insignificant market value and they will be made **open**.
3. Educational materials – of some market value but it is the interest of the project to keep them **open**.
4. Reports, reviews, bibliographies, evaluations, best practices and policy recommendations – of a medium-term value for the practitioners, public administration and citizens and will be made **open**. The project's interest is to make them available to the community and stakeholders.
5. Know-how obtained through the project research – of substantial value but the project will profit more if the know-how is directed to the dissemination with the aim to keep it **open**.
6. Models – will be made **open and reusable**. The project's interest is to make them available to the community and stakeholders.
7. Results of the pilots – important input for the dissemination and will be made **open and accessible for testing in different environments**.
8. Technological solutions behind the pilots – of significant value; **partly will not be made open** due to their reliance on the background IP rights, patents etc., and in cases of reliance on the available and/or open-source technology will be made **open**.

Regarding **open access**, the InterPARES Disrupt project will disseminate the research results implementing either "green" or "gold" open access publishing model following Guidelines to the Rules on Open Access to Scientific Publications and Open Access to Research Data in Horizon 2020.

- "Green" open access, or self-archiving model, requires the author, or a representative, archives (deposits) the published article or the final peer-reviewed manuscript in an online repository before, at the same time as, or after publication. This model sometimes requires a delay since some of the

publishers may want to sell access rights and implement pay-per-view or pay-per-download approaches for a certain period of monetization.

- "Gold" open access, or open access publishing model, requires that an article is immediately published in the open access mode. In this model, the payment of publication costs is shifted away from subscribing readers. The Article Processing Charges (APCs) are planned in the budget of the project.

The project's research data will be put in the project's repository and made **openly accessible**.

The work package 6 (Task 6.4.) will **record, monitor and measure impact** of the results of the project dissemination by using measurable indicators like number of publications produced by the researchers, number of downloads, number of access to the published articles or research data repository, geographical distribution of users, time spent using resources, number of citations etc. with the premise of growth in time. If necessary, output of the dissemination impact assessment will be used to improve dissemination plan and take corrective measures.

2.2.2. Communication activities

Project partners will pay special attention to communication activities throughout the whole project duration. Communication and dissemination activities will be coordinated by project coordinator, lead partner for WP5 and lead partner for WP7 – this includes monitoring communication and dissemination activities undertaken by each project partner, coordination of organization of dissemination events, preparation of communication and dissemination materials, regular sharing of information via partners' web pages and social media, etc.

The aims of communication and dissemination are the following:

- Informing various target groups about the project results and their impacts.
- Including public, scientific community, academia, businesses, policy-makers, governments, international organizations in wide discussion and exchange of information and knowledge about disruptive technologies in public services.
- Set understanding of the project objectives and results for end users and decision-makers in order to ensure responsiveness and readiness for future implementation and upgrade of project results.
- Ensure visibility of EU funding of InterPARES Disrupt project.

An initial **comprehensive communication plan** has been produced already at the stage of project proposal preparation jointly by the project partners. During the project implementation the comprehensive communication plan will regularly be updated and its implementation will be closely monitored. Elements of the initial comprehensive communication plan are presented below.

Target groups

Information about project progress and results will be communicated to different target groups in order to ensure wide understanding of the project topic, objectives, results and their impacts. Communication and dissemination activities target the following groups:

- **General public** – they should be informed about the project as end users of public services and stakeholders on whose lives the introduction of disruptive technologies will have the greatest impact and impact on many levels. It is important that this target group understands how they will benefit from introduction of disruptive technologies in public service processes and how security of their data and personal information will be guaranteed.

- **Public servants** – this target group is expected to feel most threatened by introduction of disruptive technologies into public service processes since they might feel they are being replaced by technology and that their jobs are being taken away. It is important that the general mindset of this target group is changed via communication and dissemination activities in a way that they understand the benefits of disruptive technologies and are ready to focus on other ways they can contribute to their workplace (such as management, public relations, advisory, technology related fields).

- **Policy-makers and governments** – these are the regulators and decision-makers who should be targeted in all EU member-states and even wider. It is important that they understand wider impact of disruptive technologies in public services, including financial aspects.

- **Academia, research and scientific community** – this target group will be informed about the project with more technical insights. In this way communication and dissemination activities will set ground for further researches and contribute to knowledge sharing in this community, which will enable continuation of innovations and improvements of public service provision.

- **Businesses** – this target group feels the administrative burden that public services can often represent, which to certain extent has negative influence on business efficiency. Many businesses are advanced in terms of using technology so communication activities will be focused on explaining impacts and possibilities disruptive technologies in public services may have on business opportunities, efficiency and harmonization of technology usage between public and private sector.

- **International organizations** – for this target group information about the project is important in order to understand how the results can be applied in their own administrative procedures as well as how disruptive technologies may affect wellbeing of the citizens worldwide.

Key messages

Depending on the role of each target group in the society, key messages should be adjusted to the audience from each of the target groups. This will be done in a way that takes into account the most sensitive areas or areas of concern of each target group. The messages will be delivered in a clear manner, including adjustments of the language (technical/non-technical) (Table 5).

Table 5. Key messages and the intended target groups

Target group	Key messages
General public	How introduction of disruptive technologies will create added value for citizens on a daily basis. What results are expected in terms of transparency, data accessibility, communicating their messages to public authorities and governments, inclusiveness, mobility of services, etc. How will protection of personal data be ensured.
Public servants	How introduction of disruptive technologies in public services will benefit the society. Possibilities that introduction of disruptive technologies will open for public servants at their workplace (efficiency, focus on new skills, opportunity to replace routine and manual work with management skills, marketing, technological knowledge, etc.).
Policy-makers and governments	How introduction of disruptive technologies will benefit decision-making processes. What does introduction of disruptive technologies means in terms of public spending and state budget. What are the impacts on GDP, socio-economic aspects, quality of public services, and legal implications. How can introduction of disruptive technologies into public services impact EU cooperation and freedom of movement and how public administrations and citizens can be protected from data loss, cyber-attacks and other threats.
Academia, research and scientific community	What is the methodological approach to the research under InterPARES Disrupt projects and how the results have been verified. What are the key findings of the project and what are the areas that need further research.
Businesses	How disruptive technologies in public services will help to boost economy, enhance business climate and ease access to markets. What is the expected impact on businesses' processes efficiency and administrative burden.
International organizations	What are the lessons learned from IntePARES Disrupt project and how can European experience be transferred to other countries. How can introduction of disruptive technologies into public services help international cooperation.

Tools and methods for effective communication

In order to ensure that key messages are effectively delivered to all target groups, several tools and methods will be applied, i.e. several types of communication and dissemination activities will be undertaken throughout the project implementation:

- **EU visibility and dissemination events** – events for invited audience from public administration, government and businesses with purpose of informing about EU financing of the project and project objectives, progress, results and impacts as well as answering questions about expected further application of project results.

- **Publications on project webpage, partners' official web pages and on social media (Facebook, LinkedIn, Twitter and other)** – regular focused information sharing about the project and its implications for general public, businesses and public administration, as well as to foster communication and raise public awareness of the benefits of research and innovation in meeting societal challenges.

- **Newsletters** – more detailed description of project progress, results and next steps that will be shared with members of academia, research and scientific community, governance, businesses and international organizations via e-mailing list. E-mailing list will be formed based on wide range of contacts from all partners, especially using contacts from previous InterPARES projects. Gathering of the contact information will follow principles of the General Data Protection Regulation, (EU) 2016/679.

- **Media coverage/press releases** – partners will use the opportunity to invite the media and share information about the project with all target groups on days project meetings will be held (planned project meetings are presented under Management structure, milestones and procedures).

- **Workshops** – throughout the project implementation four workshops for wider audience will be held with purpose of presenting the project activities and progress, but also with purpose to exchange information with some of the targeted groups about their concerns and acceptance of introduction of disruptive technologies into public services.

- **Online educational material** – project partners will produce online educational material to share main project results and lessons learned. These materials will be made available to wider public via an open digital learning platform, based on OLAT (Online Learning and Training) open source software, which will be implemented and the content developed according to the open access licenses defined for the H2020 funded projects.

Table 6. Indicative time plan of communication and dissemination activities

Applied method / dissemination activity	Implementation
EU visibility and dissemination events	M36
Publications on project website	M3 – M36
Publications on social media and partners' web sites	M1 – M36
Newsletters	M6, M12, M24, M30, M36
Media coverage/press releases	M6, M12, M24, M30, M36
Workshops	M6, M12, M24, M30
Conference	M36
Online educational material	M7, M14, M25

3. Implementation

3.1. Work plan – Work packages, deliverables

The work plan of the InterPARES Disrupt project is divided into **seven Work Packages (WPs)**.

Core activities of the project start with **WP 1 (Exploration of Existing and Emerging Disruptive Technologies)** which is focused on continuous interdisciplinary study of impact and opportunities, benefits, risks and possible constraints of using disruptive technologies in public services and administrative processes. The partners will work in 5 study groups investigating different disruptive technologies. Under WP1 a multi-criteria methodology will be developed to narrow down the number of public services from the initial basket of 20 representative public administration e-services and recommend at least 5 use cases which will be further researched under WP2 and WP3.

WP 2 (Information Creation and Management) and WP3 (Preservation and Access) focus on research of the selected public administration e-services use cases and on the impact of disruptive technologies on them. Based on recommendations from WP2 and WP3, at minimum 2 e-services will be recommended to be piloted through WP4.

WP4 (**Construction and Integration of Disruptive Transformation Technologies)** includes piloting and testing activities based on research results of WP1, WP2 and WP3. Along the 2 e-services selected to be piloted by the research, additional 3 pilots have already been identified. They are focusing on the technologies that might be applied to all or almost all e-services from the representative basket. Pilots will include testing of impact of disruptive technologies on the processes that are the same or similar to identified processes in public services and will use materials provided by the public administration supporting partners.

Progress and results of WP1 also depend on progress and results of WP2, WP3 and WP4 since WP1 will receive input from them, examine their findings and uses them for preparation of the full research report which will contain detailed description of research methodology, activities and results. The report will also include recommendations about which disruptive technologies are most adequate for which public services. WP1 will also develop best practices and policy recommendations.

On the other hand, progress of WP2, WP3 and WP4 also depends on research observations and results developed under WP1. The results of the analysis and development of relevant scientific knowledge, principles, requirements, approaches, and information about changes and impact of disruptive technologies under WP1 will constantly feed WP2, WP3 and WP4. This is why WP1, WP2, WP3 and WP4 are planned to partially be implemented in parallel.

WP5 (Communication, Education and Knowledge Dissemination) is interconnected with all other WPs of the project since its main activities relate to the development of the communication strategy and action plan, identification of communication channels, project and EU funding visibility, management of project assets, development of educational materials and dissemination of project results. This WP receives feedback from WP1, WP2, WP3, WP4 and WP6, i.e. it is receiving information from these WPs which is then translated into appropriate messages and formats that are being communicated or distributed to various target groups and/or widely.

WP6 ((Self)Evaluation and impact) will evaluate benefits, risks and social impact of implementation of disruptive technologies, evaluate infrastructure to be used as the testbed for piloting, establish and maintain project presence among relevant stakeholders in order to build impact, assess and evaluate media communication efficiency and be responsible for the building of the project's legacy. It will also provide feedback on implications of the use of disruptive technologies and quality of data gathering and analysis to WP1 which is going to be further used for information delivered to WP2 and WP3 to construct use-cases to be piloted and tested in WP4.

WP7 (Project Management) encompasses all other work packages during the project lifetime with its activities considering overall project management and Grant Agreement management. This task ensures efficient communication among project partners and EC as well as coordination of all WPs and fulfillment of all obligations that arise from the Grant Agreement.

Figure 9 outlines structure of the work packages and their interconnections.

Figure 9. WPs structure and relations

Figure 10 shows overview timings of work packages, their tasks and milestones.

Figure 10. Timings of the work packages, their tasks and milestones

Table 7 shows list of work packages, lead participants, and their duration.

Table 7. List of work packages

Work package No	Work Package Title	Lead Participant No	Lead Participant Short Name	Person-Months	Start Month	End month
1	Exploration of Existing and Emerging Disruptive Technologies	1	FHSS	109.3	1	36
2	Information Creation and Management	2	HEG	83.1	7	30
3	Preservation and Access	3	TNA	105.7	7	30
4	Construction and Integration of Disruptive Transformation Technologies	4	DedaPS	176.5	13	30
5	Communication, Education and Knowledge Dissemination	5	UCL	102.2	1	36
6	(Self)Evaluation and impact	6	HU	66.7	1	36
7	Project Management	7	EYS	62.8	1	36
				706.3		

Next, the detail description of the work packages – objectives, description of work, deliverables – is given.

Work package number	1				Lead beneficiary				FHSS		
Work package title	Exploration of Existing and Emerging Disruptive Technologies										
Participant number	1	2	3	4	5	6	7	8	9	10	11
Short name of participant	FHSS	HEG	TNA	DedaPS	UCL	HU	EYS	UniMC	ETS	CCG	UNIGE
Person months per participant:	35.9	3.4	11.5	7.1	2	11	20.7	9.5	3.3	2.2	2.7
Start month	1				End month			36			

Objectives

1. To conduct interdisciplinary study of impact and opportunities, benefits and risks of using disruptive technologies in the context of public e-services and in relation to the steps of the information, documents and records management process and constraints by relevant legal regulations.

2. To identify and select use cases with the highest potential impact on the public e-services data, information, document and records management optimisation and on the society to be further investigated in WP2 and WP3.

3. To constantly feed WP2, WP3 and WP4 with the results of the examination, analysis and development of relevant scientific knowledge, principles, requirements, approaches, and information about changes in legal regulations.

4. To develop of best practices and policy recommendations for domain-based implementations of public e-services in the context of disruptive technologies.

Description of work

All partners will participate in implementation of WP1. WP lead partner will perform coordination on WP level, making sure that on operational level of tasks delivery everything is going in accordance to the plan. WP lead partner will be responsible for day-to-day operational management of the WP.

WP1 consists of the following tasks:

Task 1.1. Collection of primary and secondary sources on disruptive technologies (Task Leader: FHSS) (M1-36)

The aim is to gather sources on disruptive technologies at the EU level with the focus on public e-services using desk research method and round table/workshop discussion with the public administration professionals. The roundtable/workshop discussion will involve representatives of the public administration from the EU member states and will be organised at the beginning of the project. The representatives will be invited on the basis of their knowledge on and/or involvement with the development of e-services in their respective EU member states.

The most intensive work is expected in the period M1-M6. All partners will be involved in this task according to their key competences for disruptive technologies. In M1-M6 it is planned to form five focused study groups (SG), consisting only of the project partners' researchers, for artificial intelligence and machine learning (SG1-AIML), big data analytics & visualisation (SG2-BDA), blockchain and Distributed Ledger Technologies (SG3-B/DLT), intelligent automation and algorithmic techniques (SG4-IAAT), simulation and gamification (SG5-SG) investigating the disruptive potential of the emerging technologies. The study groups will focus on the disruptive potential of the emerging technologies, identify and collect the relevant primary and secondary resources, and add them to the online repository which will be created by the project partners. In the research of the study groups, the researchers from different knowledge fields will focus on an impact and potential use of a particular disruptive technology for a representative basket of 20 e-services divided into two groups - e-services for citizens (G2C; 12 services) and e-services for businesses (G2B; 8 services).

Since this is a very dynamic area - the development and introduction of new disruptive technologies are constant - an online repository with publicly available articles, case studies, evaluations, papers, presentations, and toolkits, use cases, platforms etc. on the topic of disruptive technologies will be set up. Such a repository is envisaged to become a referent place to learn about the disruptive technologies.

In M7-M36 the intensity of activities will be lower, since the partners will switch focus to other WPs, but constant. In this period the partners will add resources which they identify as relevant to the collection in the repository.

Task 1.2. Development of e-services assessment methodology and metrics (Task Leader: EYS) (M1-3)

The aim of this task is to develop e-services assessment methodology for evaluation of societal and economic reach, and impact of e-services. The metrics for identification and assessment of the strongest impact of disruptive technologies on the e-services and processes connected with (re)creation, management, preservation and access will be developed. The metrics will, at minimum, consider the criteria of speed of implementation of disruptive technologies, impact reach, and cost-effectiveness. The e-services assessment methodology and metrics developed here will be used in Task 1.3. and WP2 and WP3.

Task 1.3. Assessment of the representative basket of 20 public e-services and identification of use cases for further research on the level of their processes (Task Leader: FHSS) (M4-6)

Methodology developed under Task 1.2. will under Task 1.3. be applied to the representative basket of 20 e-services (12 G2C services and 8 G2B services). For each of the 20 e-services an assessment will be done based on the information collected under Task 1.1. The focus will be on identifying key difficulties and bottlenecks in provision of these public services and on recognizing potential for improvement which can arise from introduction of disruptive technologies to these e-services. The e-services showing the strongest potential to be positively influenced by the introduction of the disruptive technologies while at the same time resulting with the significant improvement for the public administrations and citizens will be recommended for further investigation in the WP2 and the WP3. The methodology developed under Task 1.2. will enable a multi-criteria analysis and, thus, it will also enable ranking of the e-services from those on which expected impact is strongest to those on which the impact is lowest. Based on the ranking, at minimum top 5 ranked e-services will be selected as the use cases for further in-depth research in the WP2 and the WP3.

Task 1.4. Development of best practices and policy recommendations for domain-based implementations (Task Leader: FHSS) (M7-36)

This task aims to develop policy recommendations for domain-based implementations of public e-services and/or their processes and best practices in the context of disruptive technologies based on the outcomes of the WP1-6. The task aims to challenge and improve the current body of knowledge related to the data, information, documents and records management in the case of introduction of the disruptive technologies. This is needed since currently there are scarcely any recommendations on the development of policies and practices dealing with situations caused by introduction of the disruptive technologies. For example, the concept of algorithmic responsibility, proving to be unbiased, becomes relevant in cases where artificial intelligence (AI) is introduced in the context of public administration e-services. Another example is the need to preserve smart contracts (just as any other contract would be preserved) and the requirement for their interpretation in the original context later on etc.

WP interdependencies

After the initial extensive period of activity (M1-6), the WP1 will feed primarily the WP2 and 3, but also the WPs4-6, with the results of the examination, analysis and development of relevant scientific knowledge, principles, requirements, approaches, information about changes in legal regulations etc.

The WPs2-6 will provide feedback to the WP1 for reconceptualization or improvement of theoretical knowledge, models, best practices and policy recommendations.

Deliverables

D.1.1. E-services assessment methodology and metrics (M3)

D.1.2. Online repository (first version M6; final version M36)

D.1.3. Recommendation of use cases to be further analysed within WP2 and WP3 (M6)

D.1.4. Best practices and policy recommendations for domain-based implementations of public e-services in the context of disruptive technologies (drafts and iterations during the project, final version in M36)

Work package number	2			Lead beneficiary			HEG	
Work package title	Information Creation and Management							
Participant number	1	2	4	7	8	9	10	11
Short name of participant	FHSS	HEG	DedaPS	EYS	UniMC	ETS	CCG	UNIGE
Person months per participant:	13.8	39.5	4	9.5	8	4.2	2.6	1.5
Start month	7			End month			30	

Objectives

1. To analyse the application of technology in selected use cases from WP1 with regards to information creation and management in the selected public administration e-services.

2. To identify relevant trends in creation, description, organisation, appraisal and quality assessment methods and relevant tools.

3. To examine automation opportunities using disruptive technologies in creation, description, organisation and appraisal of data and information in the selected public administration e-services.

4. To investigate the application of disruptive technologies in supervised classification.

5. To identify use cases most suitable for integration of the concept of digital original in the public administration e-services.

Description of work

The lead partner's role will be to lead the research in this WP, to coordinate activities in the tasks, and to coordinate activities with other WPs ensuring provision of relevant and timely information. The involved partners will perform the planned research activities.

For the selected use cases (i.e. selected e-services) recommended by the WP1, here, under the WP2, a further analysis of disruptive technologies advantages, disadvantages, impacts and risks will be carried out in context of the following processes: information (re)creation and collection, and information management. It is important to analyse how the selected technologies can affect flow of information throughout the selected processes.

Partners will work together, according to their field of expertise, to analyse each use case in the selected context performing the following steps:

- **Identification of data sources:** For the identified e-services from the WP1, partners will identify data sources, technology, availability, type of data and metadata.

- **Collecting data:** Based on the identified data sources, partners will define and assess disruptive technologies that could collect, integrate and aggregate data in the most efficient way having in mind preservation of the data integrity.

- **Smart analysis and data enrichment:** Determine the methodology by which the best technology can be selected for the analysis and data enrichment. Chosen technology(-ies) should be able to improve enrichment of the data and provide relevant insights from which further conclusions can be made.

WP2 consists of the following tasks:

Task 2.1. Information (re)creation and collection in selected e-service use cases (Lead partner: UNIGE) (M7-30)

This task will identify and examine major trends and innovative approaches and methods of smart capture, collection, integration and aggregation of data and information using disruptive technologies in the selected e-service use cases. The partners will analyse and map the approaches to automation using the disruptive technologies. They will analyse data gathering possibilities using AI (e.g. citizens feedback to public administrations by real time data gathering from social media), investigate pattern recognition and gaining insights to the gathered data by using machine learning. The automation of the description of the gathered data of all types will be investigated (e.g. automated creation of metadata and auto-tagging). The crowdsourced and gamified approaches to the description will be investigated as well.

The project partners will develop an appraisal automation model which will apply data mining and algorithmic methods on appraisal process and appraisal metrics to assist decision makers.

The concept of born-digital original will be investigated in the context of public administration e-services. Digital original is a type of born-digital document which uses cryptographic assurance and blockchain/DLT mechanisms which can fulfil all attributes of a paper record. It is proposed as a new information type which can be created, amended, signed or transferred multiple times during its lifetime and finally invalidated when its legal use has ended while at the same time providing assurance mechanisms so that in any given time one can be sure e.g. who has the digital original, who has the rights deriving from it and who has a digital copy. The concept of digital original relies on linked timestamping as well as on blockchain/DLT principles cryptographically securing that born-digital data cannot have been created at an earlier time and that it cannot have been changed after that time. Those principles will be investigated in the context of trustworthiness of born-digital records, i.e. in the creation of documented, authentic accurate and reliable information, within the public administration e-services where the most suitable use cases for piloting will be identified.

The connection with the TrustChain model (a blockchain-based model for long-term preservation of the validity of digital certificates proving identity of the signatory in the digitally signed or sealed documents), developed by the InterPARES Trust project (April 2013-February 2019) and to be piloted in WP4, will be investigated in the context of analysis of blockchain/DLT to ensure authenticity of born-digital documents produced within public administrations.

Intelligent Automation technologies can potentially include many different technologies such as Robotic Process Automation (RPA) ("robotic" in the sense of software robots) and Machine Learning (ML) which can have profound impact in information creation and collection throughout the process. The speed and accuracy of software enabled information creation and management will be further evaluated as it can lead to a rule-based information flow with clear decision and process progress trail. Part of this task will focus on RPA as it can serve as a basis for further automation. In order to be implemented RPA requires rule-based, repetitive processes and it is suitable in scenarios where it is too expensive or inefficient for humans to execute a task or a process. One of main advantages of such technology can be found in creation of template-based unbiased information. The intelligent automation can also help in process of data harmonization and collecting inputs from various systems and storing them in a defined storage. For example, description of images in the context of information creation and collection, and harmonisation of image metadata throughout image metadata namespaces such as IPTC IIM and XMP used by Exif with the archival standard EAD, will be investigated using intelligent automation approach. Overall, the usage of RPA, gaining benefits from integration of different disruptive technologies, on selected e-services and/or their processes will be examined.

Those and other information (re)creation and collection approaches will be investigated within the public administration e-services and the most suitable use cases will be identified for piloting in the WP4.

Task 2.2. Management of structured and unstructured information in selected e-service use cases (Lead partner: HEG) (M7-30)

This task will examine the use of disruptive technologies in creation of a supervised classification machine learning-based model to explore how it may assist organisation of a huge amount of fast creating content in a variety of formats and contexts. To be efficient, algorithmic methods for big data analytics will be used for data cleaning and content profiling. It will address: 1) the applicability to the public administration e-services, 2) usability in the context of raw, unstructured data, and 3) usability in the context of processed, structured data. The processes that could benefit from such a model are (assisted) classification for public records, anonymization of information for public access etc.

The task will also examine the blockchain/DLT principles and the born-digital originals in the management phase of the information life-cycle of trustworthy born-digital records within the public administration e-services. In the information management phase the information in the system is actively managed in order to serve day-to-day business operations. The connection with the TrustChain model will be investigated in the context of managing trustworthy information.

Intelligent automation, incorporating a variety of disruptive technologies, can aid in information management as it can easily adapt to existing information ecosystem and manipulate different data from different sources, transform it with a clear transformation trail and output in human or machine-readable format. In that context, application of intelligent automation techniques, such as the previously mentioned RPA, can be beneficial as data management can be automated. This will be investigated in the selected use cases. The application of RPA will also be investigated in pre-processing of data for supervised or automatic ingest to digital archives.

Those and other information management approaches (visualisation, simulation and gamification) will be investigated within the public administration e-services and the most suitable use cases will be identified for piloting in the WP4.

WP interdependencies

The WP2 will base its activities on the input from the WP1, and will coordinate its activities with the WP4 where piloting of the recommended use cases is planned in the selected testing environments. The WP2 will, together with WP3, feed the relevant information to pilots while the pilots will provide feedback for further analysis and model development. The WP2 will also provide relevant information to the WP5, for development of educational materials and dissemination activities, as well as feedback to the WP1 for theory refinement.

Deliverables

D.2.1. Recommendation of use cases to be piloted in WP4 based on research results of WP2 – integrated with deliverable D.3.1. (M12)

D.2.2. Model for application of disruptive technologies to (re)creation, collection, description and appraisal of data and information in the public administration e-services (M30)

D.2.3. Model for application of disruptive technologies in management of structured and unstructured information in the public administration e-services (M30)

Work package number	3		Lead beneficiary				TNA	
Work package title	Preservation and Access							
Participant number	1	3	4	7	8	9	10	11
Short name of participant	FHSS	TNA	DedaPS	EYS	UniMC	ETS	CCG	UNIGE
Person months per participant:	17.8	57.6	4	9.5	8	4.2	2.3	2.3
Start month	7			End month		30		

Objectives

1. To explore the challenges of scale presented by born-digital outputs with regard to their capture, long-term sustainability, preservation and access as an evidence base for the actions of public administrations and a research resource for citizens.

2. To explore the opportunities presented by disruptive technology to describe born-digital outputs (textual, audio visual, novel and complex formats) in novel and automated ways to aid future understanding and access.

3. To explore the synergies between technologies that support appraisal and selection (WP2) and technologies that support archiving and high quality access to a broader, less rigidly defined record.

4. To explore and suggest the types of tools which might support eventual access to collections of archived born-digital outputs for citizens and businesses.

5. To explore how disruptive technologies can be leveraged to identify inherent relationships between archived records while maintaining trust.

6. To explore how the complex and probabilistic data arising from disruptive technologies processes can be made accessible to users who may not have a strong technical perspective but wish to be able to use, understand and interact with these records.

Description of work

The lead partner's role will be to lead the research in this WP, to coordinate activities in the tasks, and coordinate activities with other WPs ensuring provision of relevant and timely information. The involved partners will perform the planned research activities.

For the selected use cases (i.e. selected e-services) that will arise from initial analysis under WP1, here, under WP3, a further analysis of disruptive technologies advantages, disadvantages, impacts and risks will be carried out in context of the following processes: appraisal and acquisition, ingest, arrangement and description, preservation, and access.

In this work package the GDPR and privacy impact assessment will be done, as it is necessary in cases when the processing could result in a high risk to the rights and freedoms of natural persons, which could happen given the nature of the selected e-services.

Partners will work together, according to their field of expertise, to analyse each use case in the selected context performing the following steps:

- **Data protection impact assessment**: Definition of a process that will identify and minimize the data protection risk of using disruptive technologies.

- **Recommendation for normalization of data**: Assessment of the data and recommendation for normalization of data as a preparation for pilot phase in order to reduce redundancy and improve data integrity.

- **Determination of disruptive technologies**: Determine the most suitable technologies for appraisal, acquisition, normalization, analysis and enrichment of data as well as for opening the enriched data for public use.

Modern digital records, created and managed through the operation of disruptive technologies within public administrations, may be characterised by their scale, complexity, distribution and the absence of an intrinsic order imposed during the processes of creation.

WP3 consists of the following tasks:

Task 3.1. Disruption: sustaining records arising from the use of disruptive technologies in selected use cases of e-service delivery by public administrations (Task lead: TNA) (M7-18)

This task examines what the adoption of disruptive technologies by record depositors means for the development of archival processes. A range of potential scenarios will be investigated, such as records in social media platforms, cloud storage (big data, visualisation and simulation), dynamic documents, collaborative working environments, databases, AI-enabled decision-making as well as scenarios for records creation through gamification strategy.

Opportunities for the evolution of archival practice will be considered. The partners will evaluate new approaches to sustaining digital outputs, which leverage the opportunities offered by disruptive technologies. We will investigate automatic or semi-automatic methods to analyse unstructured information from records and record aggregations with the aim to find their meaning and enable retrieval. The partners will identify and define methods for extraction and analysis of meaningful entities such as subjects, events, names etc. as well as their semantics and relations. We will explore methods to define the reliability of our findings. This will influence disclosure of the records, paving the way for a step-change in transparency for citizens.

Today the common method to implement appraisal is to create retention schedules, transfer records to the digital archive, destroy records according to the schedules and that is done with help of software programs, but with human mind and manual skills. The partners will investigate ways to improve that process with the help of disruptive technologies.

Intelligent automation, specifically RPA, has a capability to adapt to currently existing processes in digital archives and to address appraisal but also sensitive data by performing a set of actions and rules. In that sense, RPA can follow the requirements arising from GDPR and/or other legal regulations during actions performed with sensitive records, such as the redaction of sensitive information.

The partners will explore how disruptive technologies, such as blockchain/DLT and AI, can be leveraged to identify inherent relationships between records while maintaining trust in archival processes. The best fit for incorporation of the TrustChain model will be investigated in the context of long-term preservation of digitally signed records deriving from the e-services and ingested into the digital archive.

The partners will aim to shift or even disrupt the archival paradigm which assumes that records are well defined and where the outputs of a particular function are received as a single collection.

Task 3.2. Evolution: contextualisation over time in selected e-service use cases (Task lead: TNA) (M7-24)

This task focuses on the theory that archives are always in a state of becoming, by developing a pipeline for iterative description and contextualisation using machine learning models to enrich collections over time, improving transparency, access and understand-ability. We will explore the application of disruptive technologies to address the challenges of scale and the opportunities presented by technology to describe records in novel and automated ways, in both machine-processable and human readable forms.

We will also explore sources of archival context. For example, each accession of new material into the archival environment increases the knowledge of the existing collections. We will investigate the contextualising power of a wide range of external sources from both "trusted" (public administration providing information to citizens) and "uncontrolled" (citizens providing information to public administration) environments. The techniques developed will also support the appraisal process of records. The synergies between technologies for access and appraisal will be examined. This will result in richly contextualised, more easily searchable and understandable but less rigidly defined records in an ever-changing state. We will explore the types of tools that might support a temporally aware view of the archive where users can impose their own structure and order. The use of intelligent automation in context of data access will be further examined, as it provides means to act as a human person by mimicking same actions humans would do, which suggests that by integration of RPA the same procedures can be followed repeatedly, automatically and, theoretically, to infinite number of users at the same time.

Task 3.3. Presentation, access and (re)use of complex records in selected e-service use cases (Task lead: TNA) (M15-30)

This task will explore how machine generated outputs can be made accessible to users of the archive. We will address the delicate balance between maintaining transparency and offering interpretation of complex outputs from machine learning models. In a world where many users still associate trust with certainty, we will investigate methods for quantifying, describing, presenting and explaining the outputs of inherently uncertain processes, such as data and insights derived from machine learning models or inference-based approaches. We will investigate the impact of technologies such as natural language processing (NLP) on human-computer interaction (HCI) and access behaviours.

WP interdependencies

The WP3 will base its activities on the input from the WP1, and will coordinate its activities with the WP4 where piloting is planned in the selected testing environments. The WP3 will, together with WP2, feed the relevant information to pilots while the pilots will provide feedback for further analysis. The WP3 will also provide relevant information to the WP5 for development of educational materials and dissemination activities as well as feedback to the WP1 for theory refinement.

Deliverables

D.3.1. Recommendation of use cases to be piloted in WP4 based on research results of WP3 – integrated with deliverable D.2.1. (M12)

D.3.2. Model for application of disruptive technologies to preservation of records of public e-service delivery (M30)

D.3.3. Model for application of disruptive technologies to access to records (M30)

Work package number	**4**			Lead beneficiary				DedaPS	
Work package title	Construction and Integration of Disruptive Transformation Technologies								
Participant number	1	3	4	6	7	8	9	10	11
Short name of participant	FHSS	TNA	DedaPS	HU	EYS	UniMC	ETS	CCG	UNIGE
Person months per participant:	7.8	46.1	25.5	8	15.8	7.5	42.5	1.4	21.9
Start month	13				End month		30		

Objectives

1. To develop pilots for the selected disruptive technologies in the context of information management processes estimated to have significant potential to improve public administration e-services.

2. To document results of piloted solutions using disruptive technologies.

Description of work

The lead partner's role will be to lead the research in this WP, to coordinate activities in the tasks, ensuring provision of relevant and timely information. The involved partners will perform the planned research activities. The lead partner will provide the Digital hub as a testbed environment, collect and evaluate the pilots' KPIs to be integrated in a single dashboard (based on the Digital Hub), and implement the Digital Hub's components needed to browse the KPIs and pilots results.

The main goal of this work package is to develop pilot projects for two groups: (i) at minimum 2 use cases recommended by the WP2 and the WP3, and (ii) pre-identified use cases that will examine impact of 3 currently most influential disruptive technologies on processes that are present in all or almost all public services. The implementation will be led by partners with expertise in given technology.

Each pilot will follow similar steps during the development phase which consist of the well-known steps for application development life-cycle. They are:

1. **Define the metrics.** Definition of the objectives of the pilot and proposal of the metrics for assessment of the results. The indicators defined in the assessment metrics will have SMART (Specific, Measurable, Available, Relevant and Timebound) characteristics.

2. **Design.** Design of the pilots to be developed. The partners will identify all the potential data sources that will be used during the project in every pilot area and a methodology for the analysis and evaluations of the data collected. Each partner will identify the data sources needed relating to its area of competence: the partners will define the list of datasets available, the desired analyses and the common KPIs to allow the comparison between the different pilots.

3. **Piloting.** Development of the pilots based on the chosen disruptive technologies in the analysed contexts in the WP2 and WP3 to be applied in the chosen use cases including the same or similar processes of public administration e-services selected under WP1.

4. **Testing and documenting.** Testing of the developed pilots using the previously defined metrics and documenting of the results.

5. **Evaluating and reporting.** Evaluation of the pilots and recommendations for further customization.

Piloting will follow agile methodology development using incremental approach and looping steps 3-5. Depending on the pilot, the partners are aiming at the technology readiness level (TRL) 5-7.

Dedagroup and Fondazione Bruno Kessler (FBK, https://www.fbk.eu) have jointly developed the "Co-Innovation Lab", to develop innovative solutions based on the platform called "Digital Hub". The initial aim was to create and promote new ways for the digital data and systems sharing between the central and local public administration, and other parties involved in the supply and distribution of public services.

The Digital Hub will be made available for this project and used to integrate experiences, results and data of disruptive technologies' piloted use cases.

The piloting stage will benefit from the Dedagroup's (lead partner) Digital Hub operating model, which integrates and harmonizes digital transformation skills, offering open source solution:

● for access to the distributed resources already in the system (i.e. the data and services tested in WP 4.4. in collaboration with UniMC),

● for designing an open source reference architecture for testing the software developed in the pilots,

● as testbed environment (integrating data, information, documents and records), and

● to integrate and harmonize tests' data and results.

The Digital Hub will be used as a common logical and technological infrastructure to compare the pilot's results. Furthermore, the Digital Hub will make all the pilots' results available from one dashboard. The Digital Hub guarantees the data interoperability and the openness between different parties in an innovative and open ecosystem: it is not focused on the development of specific services, but its high integration capability allows solutions to address different issues and to be used in different projects. Digital Hub's technology supports the decision process through innovative analytics algorithms and dashboards.

The Digital Hub's architecture is composed of three layers:

1. IoT Layer: IoT technologies are the most common solutions used by services enablers for collecting useful data and unlocking unknown information.

2. Data Layer: it is composed of different modules and all of them guarantee the data interoperability. The Data Catalogue and Ingest allow integration, organisation and reusability of the data coming from different data sources (IoT Layer and Community Portal). The Data Processing analyses all the standardised data, visualises the results through the dashboards and stores them into the Data Storage. The Data Layer works as a continuous cycle providing assurance of its functionalities all the time.

3. Service Layer: its main goal is the orchestration of the services guaranteeing security and stability. It is composed by the Legacy services and the API management that communicates directly with the Access Control Module.

The primary role of the Digital Hub platform is to enable the integration between various information systems available in the underlying domains for the purpose of data extraction, data analysis, and creation of the new value-added services and functionalities. The adoption of the Digital Hub in this project will support the integration of data from different sources (pilots of the project) and analyse them under different aspects unlocking new information and opportunities.

Pilots offer a highly scalable method in order to obtain results that will be potentially applied, tested or implemented at any scale and in every context. Pilots' activities will bring together researchers, public servants and other experts on innovation and public administration processes. The supporting institutions involved in the project will act as demonstrator cases as well as stakeholders and will facilitate knowledge sharing and connectivity between researchers, policy makers and practitioners.

WP4 consists of the following tasks:

Task 4.1. General piloting (Task lead: DedaPS) (M13-30)

Since the WP4 will develop one group of pilots that will be recommended by the WP2 and the WP3 (i.e. they will arise from the research results under the WP2 and the WP3), at this point it is only fair to plan general piloting without explicitly identifying the pilots. General piloting will be focused on concrete e-services and it will be done for e-services and with disruptive technologies that will be selected based on research results of the WP2 and the WP3. As mentioned in the introductory part for this WP, general piloting will be done for at minimum 2 e-services. Pilot(s) involving disruptive technologies in (re)creation, collection, description, organisation, management and appraisal of structured and unstructured data and information will be considered as well as pilot(s) addressing preservation, access and use aspects of e-services. Along with the technical aspects, all pilots will address the social impact of implementation of disruptive technologies as well as the issues related to change management.

In addition to general piloting, the partners have already identified three pilots to be developed (Tasks 4.2.-4.4.). These pilots are pre-identified because of two reasons: (i) they examine impact of 3 currently most influential disruptive technologies, and (ii) they will be done for processes that are present in all or almost all public services.

Task 4.2. TrustChain pilot (Task lead: ETS) (M13-30)

The TrustChain model was developed by the InterPARES Trust project (April 2013-February 2019). It is a blockchain-based model that addresses the issue of expiring validity of digital signatures or seals in the context of the long-term preservation. The final report states: *Long-term preservation of digital records that are digitally signed or have a digital seal attached to them is a challenge (...). Such digital records are not easy to preserve (...) because the certificates they rely on have limited duration. Apart from the three well known approaches to preservation of digitally signed records, namely 1) to preserve the digital signatures, 2) to eliminate the signatures, and 3) to record the trace of the signatures as metadata, this research proposed the model of a fourth approach – to register the validity of the digital signature in a blockchain.* (Stancic et al., 2018, p. 4) The model will be piloted using the digitally signed and/or sealed records from the testbed set created by the public administration supporting institutions. The pilot will use the project partners as nodes in the blockchain. More institutions can be added if they express their interest. The task lead partner

will put at disposal the already developed blockchain aggregator to be used as a platform to develop the TrustChain. The lead partner's patented solution for secure timestamping connecting digital resources with the real-life events for eliminating the risk of manipulation with time will be used as well. The piloted solution will be developed, tested with the user group and refined.

This specific pilot has been chosen because almost all public services can use digital signatures or seals in order to enable usage and exchange of trustworthy documents without the need to exchange the originals. Apart from the strong effect this has on trust to public services, it also has a strong impact on efficiency since documents, once digitally signed or sealed, can be exchanged fast and with high reliability.

Task 4.3. Automated curation of a coherent digital record from distributed administrative sources pilot (Task lead: TNA) (M13-24)

The pilot will examine different methods for automatically generating descriptions and presentations of textual, image and audiovisual content originating from various discrete or networked sources. It will evaluate and test different toolsets and their components and develop pipelines for the identified processes. The partners aim to pilot automated curation of a coherent digital record from distributed administrative sources. The piloted solution, integrating approaches to visualisation of uncertainty and complexity, will be developed, tested with the user group and refined.

This specific pilot has been chosen because it examines and solves the matter of data management and access for both public institutions and citizens. This pilot will examine how different types of data which have different reliable sources or are stored in different places in digital form can be not only available, but also automatically refined and presented as results of an analysis of all these data. Results of this pilot will show how public institutions offering different services can exchange data in an efficient way, but also it will show how data from the accountable institutions and reliable sources can be made available to the citizens. This has an impact on accountability, trust, transparency and accessibility of information and can thus be applied to all public e-services.

Task 4.4. Intelligent e-interaction with public administration (Task lead: UniMC) (M13-30)

Access and use of data, information, documents and records from public administration e-services is one of the basic functionalities traditionally performed by application of the life-cycle approach using EDRMS (Electronic Documents and Records Management Systems). Natural language processing (NLP), being one of the disruptive technologies, is a field at the intersection of computer science, artificial intelligence, machine learning (ML) and linguistics aiming at the development of digital solutions to process and computationally understand natural language used in public administration records. This task aims to model intelligent e-interaction with public administration that could be realized in any language. In order to prove it, the NLP solutions will be assessed, by evaluating and testing different toolsets. The Digital Hub operating model will be used as a platform for the NLP pilot prototype of e-interaction with the digital archives managed by the Italian Region Emilia-Romagna PArER (Polo Archivistico dell'Emilia-Romagna; holding over a billion digital records for one thousand administrations). The prototype will be discussed and tested with the user group in order to refine it. Although the pilot will have a limitation to the Italian language, the model will be applicable for training in any other language by applying the same toolsets and application scenarios.

This specific pilot has been chosen because it examines how to process and analyse large amounts of natural language data, which is of crucial importance for public administration since various institutions collect various types of data and they also use the data collected by other institutions, i.e. in order to provide services efficiently they also need fast access to correct and understandable data from other institutions. If the pilot shows positive results, that will mean that ML and NLP can be used for significant improvement of public e-services provision in any language.

WP interdependencies

The WP4 will base its activities primarily on the input from the WP2 and the WP3, but also from the WP1. The WP4 will provide feedback for further analysis to the WP2 and WP3. The WP4 will also provide relevant information to the WP5 for development of educational materials and dissemination activities as well as feedback to the WP1 for theory refinement. This feedback loop is necessary to ensure total project

quality as it could happen that new information is discovered during pilot implementation which could have not be foreseen previously.

Deliverables

D.4.1. Reference model for the development of the pilots, data integration and dashboard for the pilots KPIs (M15)

D.4.2. TrustChain prototype (M28) and documentation describing requirements for implementation (M30)

D.4.3. Evaluation of toolset components and pipelines for automatically generated description (M14)

D.4.4. Research prototype for automated curation of a coherent digital record from distributed administrative sources (M28) and documentation, including approaches to visualisation of uncertainty and complexity, and outputs from user tests and refinements (M30)

D 4.5. Prototype of intelligent e-interaction with public administration and evaluation report of toolsets and application scenarios (M30)

Work package number	5			Lead beneficiary					UCL	
Work package title	Communication, Education and Knowledge Dissemination									
Participant number	1	2	4	5	6	7	8	9	10	11
Short name of participant	FHSS	HEG	DedaPS	UCL	HU	EYS	UniMC	ETS	CCG	UNIGE
Person months per participant:	28.2	7.9	2.5	10.1	20	10.3	15.5	3	0.7	4
Start month	1				End month			36		

Objectives

1. To ensure project visibility and visibility for EU funding
2. To plan for and deliver external communications and dissemination of project results
3. To manage project assets, e.g. data, deliverables.
4. To develop educational materials.

Description of work

The lead partner's role will be to lead the activities in this WP, to coordinate tasks, and coordinate activities with other WPs ensuring timely delivery of input information. The involved partners will perform the planned activities.

WP5 consists of the following tasks:

Task 5.1. Development of communication strategy, action plan and identification of optimal communication channels (Task lead: EYS) (M1-2)

This task will involve the development of a communication strategy and an action plan, including social and traditional media communication and marketing tactics. The task will also focus on the identification of the most relevant communication channels to get optimal results with targeted audiences and user groups defined in the strategy action plan and will develop a campaign employing creative communication concepts. The communication strategy and action plan will take into account the EU funding visibility policy. They will also be revised throughout the project implementation if necessary.

Task 5.2. Establishing and maintaining visibility for project and EU funding (Task lead: UniMC) (M1-M36)

This task focuses on establishing a visual identity, social media presence and project website in accordance with the communication strategy and action plan to ensure visibility for the project and its EU funding. This

task will include liaison with all partners to collate and publish deliverables as well as regular project updates. This task will also involve the design and publication of project brochures which will be distributed during project events.

Task 5.3. Establishment and implementation of mechanisms to manage project assets (data and deliverables) (Task lead: UCL) (M1-36)

This task will involve establishing, implementing and updating of the Data management plan and procedures across the project following the FAIR (findable, accessible, interoperable and reusable) principles. Data management plan will define what is the purpose of the data collection/generation and its relation to the objectives of the project; what types and formats of data will the project generate/collect; re-use of existing data and how; the origin of the data; expected size of the data; to whom might it be useful ('data utility'). For example, this task will maintain an information asset register for the project, oversee information security, and establish mechanisms to mitigate against the risk of data loss.

Task 5.4. Development and delivery of open access educational materials (Task lead: UniMC) (M7-36)

Production and publishing of educational materials, including rich media materials developed and collected during the workshops detailed in task 6.3., which can contribute to a wide community reach and engagement of the project outcomes. The academic partners will develop additional educational materials and integrate the project results in the courses they teach.

An open digital learning platform, based on OLAT (Online Learning and Training) open source software, will be implemented and the content developed by the project partners will be made available according to the open access licences defined for the H2020 funded projects.

Task 5.5. Dissemination planning, knowledge management and protection (Task lead: FHSS) (M1-36)

This task will include liaison with all partners to plan publishing of the research results. The dissemination plan will include a knowledge management and protection strategy. The open access to all project publications will provided either by taking "green" or "gold" open access model. The project will take the "open research data by default" approach. The project partners will disseminate the research results at the international conferences, relevant, peer-reviewed international scientific and professional journals etc. in order to achieve maximum dissemination effect. This task will also involve scientific coordination of a conference to be held in M36 to mark the end of the project and provide a platform for the dissemination of the final results of the project.

WP interdependencies

The WP5 will base its activities on the input from all other WPs. Output from the communication, dissemination and educational activities will be fed back to the relevant WPs.

Deliverables

D.5.1. Communication strategy and action plan (M2, action plan revised on a yearly basis M12, M24)

D.5.2. Website and the identified optimal communication channels set up (M3) and maintenance (M4-36)

D.5.3. Data management plan and procedures (M4, regularly checked and updated M5-36)

D.5.4. Digital learning platform (M6) and educational materials (M7-36)

D.5.5. Dissemination plan (first version M6, regularly updated)

Work package number	6			Lead beneficiary				HU	
Work package title	(Self)Evaluation and impact								
Participant number	1	2	4	5	6	7	8	9	10
Short name of participant	FHSS	HEG	DedaPS	UCL	HU	EYS	UniMC	ETS	CCG
Person months per participant:	5.2	1.4	2.3	13.1	34	2.2	4	2	2.5
Start month	1				End month			36	

Objectives

1. To plan and build for the delivery of impact, in collaboration with relevant stakeholders.

2. To collate and develop findings concerning impact (the transformative impact of disruptive technologies in public e-services).

3. To continuously monitor the impact of project activities.

4. To assess social impact of introduction of disruptive technologies for public administration and citizens.

5. To assess the potential for an increase in trust in the data, decisions, and democracy.

Description of work

The lead partner's role will be to lead the activities in this WP, to coordinate tasks, and coordinate activities with other WPs ensuring timely delivery of input information and providing feedback to them. The involved partners will perform the planned activities.

WP6 consists of the following tasks:

Task 6.1. Evaluation of benefits, risks and social impact of using the disruptive technologies (Task lead: HU) (M1-36)

In this task findings from the WPs2-4 will be collated to lead to the development of a holistic report on the transformative impact of disruptive technologies (Al, big data analytics and visualisation, blockchain/DLT, intelligent automation, simulation and gamification) in public administration e-services. During this process, additional surveys and assessment models will be developed for measuring the potential for business process impact and social impact. At minimum the following evaluation will be performed:

1. Assessment of benefits and risks from the disruptive technologies-improved public administration e-services for citizens and businesses.

2. Assessment of benefits, risks and business processes efficiency gain for public administration.

3. Assessment of accountability and transparency increase in public e-services.

4. The social impact analysis of introduction of disruptive technologies to public administration e-services.

5. Assessment of the needed change management procedures in relations to evaluation assessment results under 1-2.

Task 6.2. Evaluation of the infrastructure (Task lead: HU) (M1-30)

This task includes test-beds assessments (such as SWOT and risk assessments) and will be carried out to explore current conditions and potential challenges in the institutions that will be used by testbeds as the demonstrator cases for piloting in WP4. The evaluation of the testbed environment will be performed. The assessment tools will be developed and the initial analysis will be conducted during the first year of the project (M1-12). Following this, the continuous monitoring and evaluation of the used testbed infrastructure will be carried out in order to ensure quality outputs of all processes using the infrastructure (M13-30).

Task 6.3. Building impact through stakeholder engagement (Task lead: UCL) (M1-36)

This task focuses on building and maintaining mutually beneficial relationships with relevant stakeholders with a view to maximising impact. It will include organization of four workshops (M12, M18, M24, M30) in four different countries (countries of origin of project partners) to invite dialogue on the work being undertaken in WPs2-4. The participants in previous workshops will be invited to the later ones, to slowly expand a community around the project. The stakeholder perspectives from the workshops will be used in the production of educational and informational resources (published and presented on the platform developed by Task 5.4.).

Task 6.4. Ongoing evaluation of impact (Task lead: HU) (M1-36)

In this task the partners will record and monitor details of developing impact. Analysis of web page logs, social media posts, downloads, feedback from stakeholder engagement activities etc. will be conducted and information about the dissemination activities of every partner organization will be collected and reported. This collected information will be fed back into the WP5 to allow for changes to the communication action plan and dissemination plan, and to WPs1-4 to allow for changes in dissemination and impact activities as necessary.

Task 6.5. Legacy building (Task lead: UCL) (M30-36)

This task focuses on bringing the project to an end in a way that will allow its impact to continue. It will include working with the established stakeholder community over the last 6 months of the project to discover how project outputs and results might best be configured to ensure that they remain of ongoing benefit to that community. It will also involve inviting community input into the identification of impact to the end of the project.

WP interdependencies

The WP6 will base its activities on the input from all other WPs. Output from the (self)assessment and impact analysis fill be fed back to the relevant WPs.

Deliverables

D.6.1. Report assessing the benefits, risks and social impact of using disruptive technologies (M35)

D.6.2. Infrastructure evaluation reports (draft M12, final M30)

D.6.3. Co-created educational/informational resources (M12, M18, M24, M30). Designed in conjunction with stakeholders, these resources will ensure that outputs from the project are framed in terms relevant to different communities, in order to maximise their exploitation.

D.6.4. Impact reports (M12, M24, M36), detailing all communication and stakeholder engagement activities completed and planned, leading to updated or confirmed dissemination and impact strategies and plans.

Work package number	**7**	**Lead beneficiary**		EYS
Work package title	Project Management			
Participant number	1		7	
Short name of participant	FHSS		EYS	
Person months per participant:	8.8		54	
Start month	1	**End month**		36

Objectives

1. To provide the overall project management ensuring that the envisaged project results are achieved according to the plan, including timely and correct fulfilment of all obligations that arise from the Grant Agreement

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Description of work

This WP is divided into 3 main tasks as described below. All tasks will be implemented and coordinated by WP7 lead partner – EY, while Project coordinator – FHSS will be included on overall management level and will be in charge of overall communication with European Commission representatives as well as submission of all Project deliverables, reports and requested information. Other project partners will contribute to implementation of WP7 by giving their inputs about progress of activities, finances and other information, as well as by participating in project meetings and visibility events.

WP7 consists of the following tasks:

Task 7.1. Overall project coordination and WPs coordination (Task lead: FHSS) (M1-M36)

This includes day-to-day monitoring of project implementation dynamics and progress based on regular communication with all project partners. It is expected that all project partners will regularly inform the Project coordinator on the progress of their work. Special attention will be paid to inter-dependencies between work packages (progress and results of WP1 directly depend on progress and results of WP2, WP3 and WP4; progress and results of WP5 and WP6 depend on progress and results of WP1, WP2, WP3 and WP4) and for this purpose Project coordinator and WP leaders will regularly report on activities, risks and necessary mitigation measures under each WP.

Task 7.2. General project management (Task lead: EYS) (M1-M36)

This task aims to ensure effective overall management of all project activities. For this purpose, the following activities will be carried out throughout the whole project duration:

- **Monitoring financial progress of WPs and overall project.** In order to ensure the implementation of WPs is within planned budget and according to the described work plan WP7 lead partner will set-up an internal financial monitoring system which will enable planning and monitoring the information about personnel engagement, subcontracting, in-kind contributions and all other costs that will arise from project implementation, as well as planning and monitoring of received payments from the European Commission. This will be done on level of each project partner and on level of each WP.

- **Monitoring physical progress of WPs and overall project.** The purpose of this activity is to regularly monitor to which extent have the planned activities been implemented under each WP and to have a clear understanding of next steps in project implementation. The purpose of this activity is also ensuring that the outputs of the WPs and the whole project are produced is in accordance with planned timeline, without delays and that project milestones are being achieved.

- **Preparing and implementing a project quality management plan.** By applying quality management activities and procedures, Project partners want to ensure not only that the WPs and whole project are being implemented on time and producing planned deliverables, but also that

project deliverables and outputs are of high quality which will allow that this project gives the best possible results which can be used for implementation of concrete disruptive technologies as well as for next step researches. In order to ensure consistent level of quality of work and deliverables of all partners and for all WPs a project quality management plan will be prepared in the beginning of project implementation. This document will serve as a guideline for all project partners and as a checklist for project coordinator and WP7 lead partner.

- **Risk management.** This activity includes regular risk identification, risk classification into categories, risk assessment and prioritization. Risk management will be implemented by using a risk register as a tool for notating identified risks and their assessment results, as well as developing specific action plans to address those risks and to reduce the likelihood and impact of risk appearance. Risk management activities that need to be continuously applied by all partners will also be included in the risk register. Risk register will be regularly updated by WP7 lead partner and shared with all partners.

- **Ensuring effective collaboration and communication between partners.** In order to ensure timely, high quality and efficient project implementation, a continuous and fluent communication between partners is crucial. Therefore, several collaboration and communication tools and methods will be applied. Firstly, already at the stage of preparation of this project proposal an indicative plan of project meetings has been produced which envisages the following: (i) Consortium meetings – meetings of all project partners which will be held every 6 months for purpose of wide discussion and detailed presentation of project activities progress, potential issues and next steps planned by each partner, (ii) Steering Committee meetings – meetings of Project coordinator and WP lead partners' representatives which will be held once a year for purpose of high level coordination, (iii) Advisory Board meetings – meetings of Steering Committee members with external experts and collaborators for purpose of additional quality review of project results and recommendations for next steps. Apart from project meetings an online collaboration tool will be used as a document storage and facilitator in document exchange to ensure availability of updated information and overall information and data flow between partners.

- **Ensuring project activities are in compliance with applicable EU and national legal framework.** Throughout the project implementation WP7 lead partner will regularly follow changes in national and EU regular framework and encourage other partners to share information from their respective countries. This activity also includes monitoring of respect of data-protection and ethics regulation framework with respect to this project activities and results.

Task 7.3. Grant Agreement management (Task lead: EYS) (M1-M36)

The purpose of this task is to ensure that all obligations that arise from Grant Agreement are being duly respected throughout the whole project implementation. The following activities will be implemented:

- **Timely reporting in accordance with Grant Agreement.** As per Model Grant Agreement, there are two main types of reports that must be submitted to European Commission. Firstly, WP7 lead partner will prepare technical part of Periodic reports which will contain information about progress of activities and WPs implementation in the reporting period; information about progress in achieving project milestones, results and objectives; information about possible difficulties, causes of those difficulties and plan for resolving them; information about identified risks and planned mitigation measures; information about implementation plan for the next reporting period and for the whole remaining period until the end of the project. In addition, technical part of the Periodic reports will contain an updated Plan for the exploitation and dissemination of the result, a summary for publication and answers to the questionnaire. Periodic reports are planned to be submitted to European Commission at the beginning of each calendar year for period covering previous calendar year ending with 31 December, if not differently required per Grant Agreement.

  WP7 lead partner will also prepare a Final report which will be delivered in addition to the Periodic report for the last reporting period within 60 days following the end of the last reporting period. Technical part of the Final report will contain information about activities that were carried out; information about concrete results of the project and project impact; information about dissemination of project results and their exploitation in the upcoming period.

- **Preparation and submission of Payment requests.** Besides technical part of Periodic reports and the Final report, a financial part will also be prepared and submitted alongside. As part of Periodic reports, a Financial periodic report will be prepared which will contain information about various types of costs (personnel costs, other direct costs, subcontracting, in-kind contribution, etc.) incurred in the respective reporting period by per each beneficiary and per each WP. Financial periodic report will contain individual financial statements, copies of receipts, personnel timesheets, explanation of the use of resources and request for interim payment for respective reporting period. WP7 lead partner will collect and thoroughly review all partners' costs and attached documentation before submitting the Report.

  As part of the Final report, a Final financial report will be prepared and submitted. The Final financial report will contain Request for payment of the balance and a certificate on the financial statements, where applicable.

- **Submission of project deliverables**. WP7 lead partner will collect all project deliverables and sort them per WPs regularly. Before the deadlines set in Grant Agreement for submission of deliverables WP7 lead partner will review all WPs packages and Project coordinator will submit the deliverables. All deliverables will be described in more details during reporting.

- **Preparation and submission of information and data requested for carrying out reviews, checks and audits.** WP7 lead partner will ensure that there is a complete, verifiable and systematized audit trail in each stage of the project implementation. This includes keeping on-line records for all project partners (statements, deliverables, subcontracts, receipts, timesheets, etc.) as well as giving clear guidelines to all partners for keeping of physical records. WP7 lead partner will ensure that required partners are present during reviews, checks and audits and will together with partners' inputs prepare answers to checks or audit findings. This includes on-the-spot checks, ex-ante and ex-post checks as well as audit or any other kind of review European Commission might request.

- **Regular communication with EC and exchange of information.** Project coordinator and WP7 lead partner will be the first line of communication for European Commission representatives. Any important information during project implementation will immediately be shared with the EC representatives and all information that will be requested by the EC representatives will be made available in due time. This also includes preparing and providing relevant information requested by the EC to support evaluation of the impact of taken actions. There are also Review meetings with EC representatives envisaged to take place during project implementation for which dynamic will be agreed upon Grant Agreement signature.

WP interdependencies

This WP is interdependent with all other WPs since it enables effective coordination and ensures timely communication and collaboration between all partners under all WPs. WP7 tasks have preparatory and reactive nature (sets ground for implementation of all WPs and gives proper response based on WPs progress and inputs).

Deliverables

D.7.1. Quality management plan and risk register (M1)

D.7.2. Progress reports as per dynamics set in the Grant Agreement (M12, M24 and last Periodic report to be sent together with the Final report 60 days after the last month (M36) of Project implementation)

D.7.3. Final report (60 days after the last month (M36) of project implementation)

Table 8. List of deliverables

Deliverable No	Deliverable name	Work package number	Short name of task lead participant	Type	Dissemi- nation level	Delivery date (in months)
D.1.1.	E-services assessment methodology and metrics	1	EYS	R	PU	3
D.1.2.	Online repository	1	UniMC	DEC	PU	first version M6; final version M36
D.1.3.	Recommendation of use cases to be further analysed within WP2 and WP3	1	FHSS	R	PU	6
D.1.4.	Best practices and policy recommendations for domain-based implementations of public e-services in the context of disruptive technologies	1	FHSS	R	PU	drafts and iterations during the project, final version in M36
D.2.1.	Recommendation of use cases to be piloted in WP4 based on research results of WP2 – integrated with deliverable D.3.1.	2	HEG	R	PU	12
D.2.2.	Model for application of disruptive technologies to (re)creation, collection, description and appraisal of data and information in the public administration e-services	2	UNIGE	R	PU	30
D.2.3.	Model for application of disruptive technologies in management of structured and unstructured information in the public administration e-services	2	HEG	R	PU	30
D.3.1.	Recommendation of use cases to be piloted in WP4 based on research results of WP3 – integrated with deliverable D.2.1.	3	TNA	R	PU	12
D.3.2.	Model for application of disruptive technologies to preservation of records of public e-service delivery	3	TNA	R	PU	30
D.3.3.	Model for application of disruptive technologies to access to records	3	TNA	R	PU	30
D.4.1.	Reference model for the development of the pilots, data integration and dashboard for the pilots KPIs	4	DedaPS	R	PU	15
D.4.2.	TrustChain prototype and documentation describing requirements for implementation	4	ETS	DEM R	PU PU	prototype M28, documentation M30
D.4.3.	Evaluation of toolset components and pipelines for automatically generated description	4	TNA	R	PU	14

Deliverable No	Deliverable name	Work package number	Short name of task lead participant	Type	Dissemi-nation level	Delivery date (in months)
D.4.4.	Research prototype for automated curation of a coherent digital record from distributed administrative sources and documentation, including approaches to visualisation of uncertainty and complexity, and outputs from user tests and refinements	4	TNA	DEM R	PU PU	prototype M28, documentation M30
D.4.5.	Prototype of intelligent e-interaction with public administration and evaluation report of toolsets and application scenarios	4	UniMC	R	PU	30
D.5.1.	Communication strategy and action plan	5	EYS	R	PU	(M2, action plan revised on a yearly basis M12, M24)
D.5.2.	Website and the identified optimal communication channels set up and maintenance	5	UniMC	DEC	PU	web & communi-cation channels M3, maintenance M4-36
D.5.3.	Data management plan and procedures	5	UCL	R	PU	M4, regularly checked and updated M5-36
D.5.4.	Digital learning platform and educational materials	5	UniMC	DEC	PU	platform M6, materials M7-36
D.5.5.	Dissemination plan	5	FHSS	R	PU	1st version M6, regularly updated
D.6.1.	Report assessing the benefits, risks and social impact of using disruptive technologies	6	HU	R	PU	35
D.6.2.	Infrastructure evaluation reports	6	HU	R	PU	draft M12, final M30
D.6.3.	Co-created educational/informational resources	6	UCL	DEC	PU	12, 18, 24, 30
D.6.4.	Impact reports detailing all communication and stakeholder engagement activities completed and planned, leading to updated or confirmed dissemination and impact strategies and plans	6	UCL	R	PU	12, 24, 36
D.7.1.	Quality management plan and risk register	7	EYS	R	PU	1
D.7.2.	Progress reports as per dynamics set in the Grant Agreement	7	FHSS/EYS	R	CI	12, 24, M36+60 days
D.7.3.	Final report	7	FHSS/EYS	R	CI	M36+60 days

3.2. Management structure, milestones and procedures

The InterPARES Disrupt project gathers partners from the EU and non-EU member states. **The management structure is organised around the Project Coordinator (PC), Steering Committee (SC), Advisory Board (AB) and Work Package Leaders (WPL)** (Figure 11). Following the subsidiarity principle, the decisions will be taken both at the WP level by WP leaders and at the project level by the Project Coordinator, Advisory Board and Steering Committee. Due to the large number of partners and the complexity of the whole project (contains many different phases such as research, selection of use cases, piloting and testing, impact assessment and dissemination that require different set of skills and expertise), the management and quality assurance structure is organized at different levels.
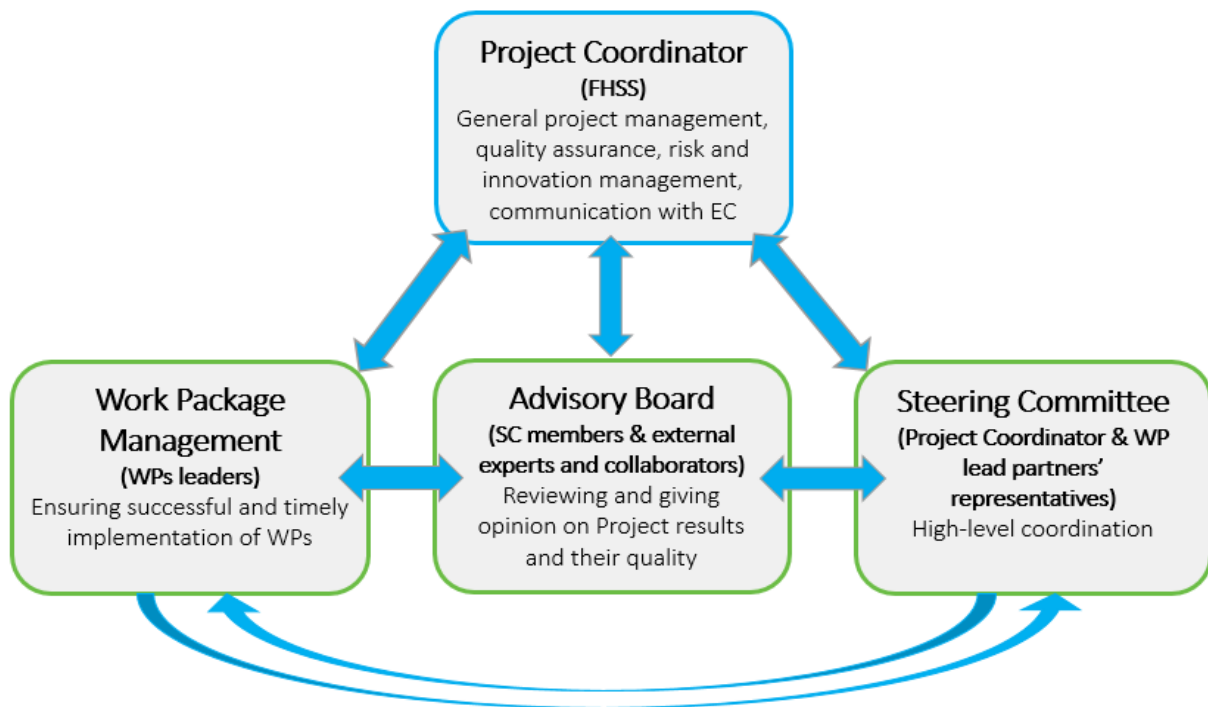

Figure 11. Project management structure

Project Coordinator (PC)

Project Coordinator – FHSS will be included in the general project management activities on one side and on the other side will be in charge of regular communication with EC as well as for submission of all project deliverables, reports and any requested information. PC will, together with the lead partner for WP7 (project management), perform the activities related to the project management and, among other, will:

- Coordinate the overall project progress and WPs to ensure successful implementation of the project and to timely address possible risks and delays.
- Coordinate communication between the partners to ensure effective collaboration and timely submission of all deliverables and reaching the project milestones.
- Organise and chair Consortium meetings (meetings of all project partners every six months), Steering Committee (SC) meetings (meetings of Project coordinator and Work Package Leaders (WPL) once a year) and Advisory Board (AB) meetings (meetings of SC members with external experts once a year).

Steering Committee (SC)

Steering Committee will be composed of a Project Coordinator and WP lead partners' representatives. The SC will be stablished for the purpose of high-level coordination where all WPLs will together:

- Discuss the project progress and already reached project milestones.
- Discuss any possible obstacles/barriers that appeared during the project implementation and accordingly decide on the need for the modification of the time plan and deadlines for submission of deliverables.
- Make decisions concerning legal, contractual and financial aspects.
- Validate dissemination activities.
- Monitor project's results for protection of IPR and possible exploitation and standardization.

As in the other boards, in the composition of the SC, the gender balance will be respected.

Advisory Board (AB)

Advisory Board will be comprised of SC members and external experts and collaborators. With their knowledge and experience, external experts and collaborators will provide added value to the project results by additionally reviewing them and give their opinion on their quality. In communication with AB members, advice on further steps in the project implementation might be discussed. AB members will also provide access to the information or resources that the project team does not have, or dissemination possibilities to the stakeholders or groups of professionals that the project team otherwise would not have access to. The project will actively seek to broaden the base of AB members.

The InterPARES Disrupt project has formed an Advisory Board consisting of experts who can provide added value to the project (Table 9). The project will actively seek to broaden the Advisory Board with new members once the project starts, especially trying to achieve gender balance.

Table 9. InterPARES Disrupt project Advisory Board members

Name: Kuldar Aas	**Gender:** male
Institution & position: 1. E-ARK initiative / Technical lead 2. Digital Archive of the National Archives of Estonia / Deputy Director	
Country: Estonia	
As an expert with broad knowledge in digital preservation and implementation of public administration e-services in Estonia he will: • provide a connection with the E-ARK initiative • ensure project partners are taking into account all relevant EU policies, practices and interests appropriately • enable wider dissemination of project results with cross-border effect, including outside of the EU	
Name: Dr. Shadrack Katuu	**Gender:** male
Institution & position: University of South Africa, Department of Information Sciences / Research Fellow	
Country: Kenya	
As an expert with broad knowledge in information management and experience in working for the international organizations (International Atomic Energy Agency, UN) he will: • provide an insight for application of disruptive technologies to the services and processes that might be of interest for international organizations • provide expertise in application of maturity models • enable dissemination of project results throughout the African continent	

Name: Raivo Ruusalepp	Gender: male

Institution & position:
1. National Library of Estonia / Director of Development
2. Information management and digital transformation specialist in Singapore

Country: Estonia / Singapore

As an expert who has long experience with e-government services and cultural industries, and has been part of teams that define national strategies for data embassies and e-government services he will:
- provide an insight in the development of e-government services in Estonia
- provide expert advice in application of disruptive technologies to public administration e-services and application of the digital first principle

Also, as an information management and digital transformation specialist in Singapore he will:
- enable dissemination of project results in the Singapore area and bring their experiences to the project

Name: Dr. Sven Schlarb	Gender: male

Institution & position: Austrian Institute of Technology / Scientist

Country: Austria

As an expert with the broad knowledge in the field of data mining and natural language processing (NLP) in the context of very large digital document collections and digital archives he will:
- provide expert advice in software development and large-scale data processing platforms, NLP and machine learning (ML) frameworks to be applied to large volumes of public administration documents
- provide expert advice on smart contracts and blockchain/DLT

Extended support

The support to the InterPARES Disrupt project has been extended by the following institutions:

1. Barcelona Education Consortium, Spain
The research findings and recommendations arising from this project should assist the Barcelona Education Consortium to develop and implement policies and practices for responding to and using disruptive technologies to establish trust in the data, information, documents and records it creates, and thereby make the Barcelona Education Consortium's systems infrastructure stronger, being able to provide better and innovative services to citizenship, and define more accurate evidence-based public policies.
2. International Federation of Red Cross and Red Crescent Societies (IFRC), Switzerland
The project results will assist the International Federation develop and implement sound policies and practices for responding to and using disruptive technologies to establish trust in the data, information, documents and records it creates and maintains across its 60+ offices worldwide, and thereby enhance the International Federation's ability to prevent and alleviate human suffering around the world.
3. National Archive of Brazil, Brazil
The research findings and recommendations arising from this project should assist the National Archives develop and implement sound policies and practices for responding to and using disruptive technologies to establish trust in the data, information, documents and records created and maintained by government agencies, and thereby enhance the National Archives ability to guide government agencies on digital records management and preservation.
4. National Autonomous University of Mexico, Mexico
The research findings and recommendations arising from this project should assist undergraduates for responding to and using disruptive technologies to establish trust in the data, information, documents and records it creates and maintains, and thereby enhance our research group ability to prepare students generate knowledge.
5. Open Administration of Catalonia (AOC), Spain
The research findings and recommendations arising from this project should assist the Consorci Administracio Oberta de Catalunya to provide better and more innovative services to citizens.
6. Regione Emilia-Romagna, Italy
The Polo Archivistico dell'Emilia-Romagna (PArER) of Istituto per i beni artistici, culturali e naturali (IBC) of the Region Emilia-Romagna preserves in the repository over a billion of digital records for one thousand administrations and will be actively following the project as it develops, and implementing the

project findings where applicable. The research findings and recommendations arising from this project should assist the ParER develop and implement sound policies and practices for responding to and using disruptive technologies to establish trust in the data, information, documents and records, for record-making, record-keeping and record preservation to ensure good governance, support a strong digital economy, and produce a persistent documentary memory in respect of the rights of every human being.

Work Package Management

Each of the 7 work packages (WP) has a lead partner who is in charge of ensuring its successful implementation by respecting deadlines and ultimately reaching its objectives. The leaders of the work packages have been selected between the partners and they have been designated to a particular WP according to their expertise and experience in a particular area. The responsibilities of each WPL include:

- Ensuring successful and timely completion of WP activities.

- Ensuring communication and management of the activities of all other partners involved in the WP.

- Reviewing project deliverables and ensuring their quality.

- Assisting the Project Coordinator in monitoring the WP progress and reporting PC about all tasks that have been completed and the ones that are still to be performed as well as about reaching the milestones of the WP.

- Organisation and chairing meetings on the WP level with all the partners who participate in the WP that is under the responsibility of a particular WPL. WP-level kick-off meeting will be organized before launching each WP.

Besides the SC and AB and their meetings, Consortium meetings will be held every 6 months, at the location of a different partner, where all project partners will be present. The aim of these meetings is to present and discuss the project activities progress, potential issues and next steps planned by each partner. The fact that all partners will be present will be used to organise a visibility and community engagement event (workshop) on the margins of the meeting in order to save on the travel expenses.

Management procedures

A set of management principles and procedures will be implemented in order to establish project organization and decision-making structure that will be adequate for development and successful completion of all project activities and tasks.

Project planning, coordination and control

The project progress will be planned, coordinated and controlled on the overall level of the project by PC and on the WP level by WPL. Work progress and resource allocation will be based on an initial time plan set at the start of the project and will be continuously monitored by using dedicated project management tools. Control of the completed activities and activities in progress as well as planning of next steps will be performed by organizing meetings on WP level and Consortium, SC and AB meetings. Since most of the meeting (Figure 12) are set to correspond to the milestones (Table 10, Figure 10), during the meetings the decisions will be made based on the expected project dynamics. Progress reports will be prepared periodically by WPLs for every WP and after being consolidated by the Project Coordinator they will be submitted to the European Commission.

Table 10. List of milestones

Milestone number	Milestone name	Related work package(s)	Due date (in month)	Means of verification
1	Kick-off meeting	7	1	Meeting notes incorporating a project manifesto
2	Use cases selected for further research in WP2 and WP3	1	6	Report with recommendation of use cases to be further analysed within WP2 and WP3 (D.1.3.)
3	Use cases selected to be piloted in WP4	2, 3	12	Reports with recommendations of use cases to be piloted in WP4 (D.2.1., D.3.1.)
4	Preliminary results of piloting disseminated	4, 5	24	Information on preliminary results of piloting disseminated in accordance with the project's communication strategy
5	Final results of WP2-4 disseminated	2, 3, 4, 5	30	Reports on models for application of disruptive technologies (D.2.2, D.2.3, D.3.2, D.3.3), TrustChain prototype (D.4.2), evaluation report for automatically generated description (D.4.4), and prototype for automated curation of a coherent digital record (D.4.5)
6	Best practices and policy recommendations and impact assessment formulated	1, 6	36	Final project report
	Project closure and final dissemination event held	5, 7		Meeting notes, final conference programme, dissemination in accordance with the project's communication strategy

Quality assurance and risk management

As part of the project management activities, a quality management plan and a risk register will be prepared. **Quality management plan** will contain guidelines and procedures related to the management of the project activities on a daily basis. The plan will set the quality objectives, standards, control activities, roles and responsibilities as well as tools and reporting practices for all project deliverables. For quality assurance previous experience of partners in the implementation of the EU funded projects, experience and organisation of experts' work, motivating working environment focused on innovation and mutual collaboration, usage of different project management tools and adequate risk management will be used.

During the implementation of the project, it is necessary to identify all threats in real time, i.e. the risks that may endanger the whole implementation and lead to incomplete realization of desired results and objectives. To promptly address all the risks, all identified risks will be assessed, prioritized and grouped. Prioritized and grouped risks will be saved in a form of a **risk register** that will be timely updated and will serve as input data for qualitative and quantitative risk analysis. The risk register will, besides the risks, contain risk mitigation or avoidance measures. Since the project is required to be regularly monitored, the risk mitigation measures will be redefined and adapted as necessary. To ensure that the risk management process is at the highest level of quality and to ensure the successful implementation of the project, regular communication between the partners and EC will be ensured. In addition to communicating about the identified risks and risk management status, the goal of communicating is to provide a clearer picture of the status of project implementation.

For each risk, a risk matrix (Table 11) will be used to analyse the probability of occurrence / risk realization, the extent of its impact on the project and the success of the implementation. Each risk will be assessed to be at one of the three levels:

- Low – risk cannot endanger the project, it can cause minor and easy solving difficulties.

- Medium – risk can cause significant difficulties, additional costs, delays in implementation.

- High – risk can cause serious and hardly solving difficulties and significantly jeopardize the overall implementation of the project, even cause the impossibility to complete the implementation, by seriously bringing the project's cost-effectiveness into question.

Table 11. Risk matrix

		Impact		
		Low	Medium	High
Likelihood	High	Medium	High	High
	Medium	Low	Medium	High
	Low	Low	Low	Medium

Table 12 shows the identified risks and the appropriate risk-mitigation measures.

Table 12. Risks for implementation of project activities

Description of risk (likelihood / impact)	Work package(s) involved	Proposed risk-mitigation measures
Internal risks		
1. Lack of cooperation from team members (low / medium = low)	All	Effective management of the team members and activities.
2. Inability to keep qualified team members during the whole duration of the project (low / high = medium)	All	Taking appropriate measures to ensure the availability of qualified team members.
3. Lack of clearly defined, communicated and mutually accepted project responsibilities between team members (low / low = low)	All	Development of action and work plan with clearly defined responsibilities of each team member.
4. Lack of communication between team members (low / medium = low)	All	Establishment of effective communication channels, development of a communication plan, additional training in communication skills (if necessary).
5. Project activity exceeds timeframe (medium / high = high)	All	Active monitoring of the activities and taking timely measures to notify the team members if an activity might exceed the timeframe.
6. Technology-related problems during piloting, or web, repository, learning environment development (medium / medium = medium)	4	Hardware and software setup will be adjusted, and extra measures will be taken in order to make sure that the system runs smoothly.
7. Results of piloting are not representative enough (low / high = medium)	4	Increase the number of input resources to achieve representativeness.

8. Quality of the research results does not reach the required level	1-6	Improvement of the quality management plan and its clear communication to all team members.
External risks		
9. Inability to acquire enough information on public administration e-services to reach informative decisions (low / high = medium)	1, 2, 3	Exploration of alternative ways to find relevant information. Consultation with the Advisory Board members.
10. Inability to obtain access to the resources needed for piloting (low / high = medium)	4	Exploration of alternative resources. Consultation with the Advisory Board members.
11. Dissemination reach – inability to reach targeted audiences, connect with targeted stakeholders, disseminate project results (low / high = medium)	5	Improvement of the dissemination plan, communication strategy and action plan. Consultation with the Advisory Board members.

As far as the quality check of deliverables is concerned, all deliverables done by the partners for a particular WP will be sent to the WPL and the Project Coordinator who will review them before submitting them to the Steering Committee. SC will then review the documents and approve the final version or ask for additional changes or improvements of the document. The decisions in the SC will be taken by using the majority vote principle.

Innovation management

The project will implement the principles of **living lab research concept** since it will use the real life cases (examples of public e-services) in the research process and involve the end users (public servants, citizens, businesses) in the research, piloting and testing phase of the project. The end users will have an active role as co-creators since they will contribute by exposing their problems regarding actual way of providing e-services and by giving their ideas for improvement of these services. The partners who bring their expertise to the project and cover different areas (such as computer science, social sciences, public sector business processes and digital customer experience, etc.) will be actively involved in the research settings, confronted with the technical, social and political dynamics of innovation.

Internal communication

All partners will be up to date with the project status, any potential issues and next steps. For this purpose, an online collaboration tool will be used as a document storage and facilitator in document exchange. In this way all partners will receive the most recent relevant information. Furthermore, both online and onsite meetings will be organized. Meetings will be organized by the Project Coordinator and WPL who will also prepare and distribute meeting minutes internally and to the European Commission. To avoid unnecessary travel and to reduce the travel expenses, most of the meetings will be organized virtually, using an online tool for organization of electronic meetings. Moreover, online meetings enable certain flexibility since they can be organized at any time without additional costs. Figure 12 summarizes the meetings that will be organized during the project (additional meetings may be organized if necessary).
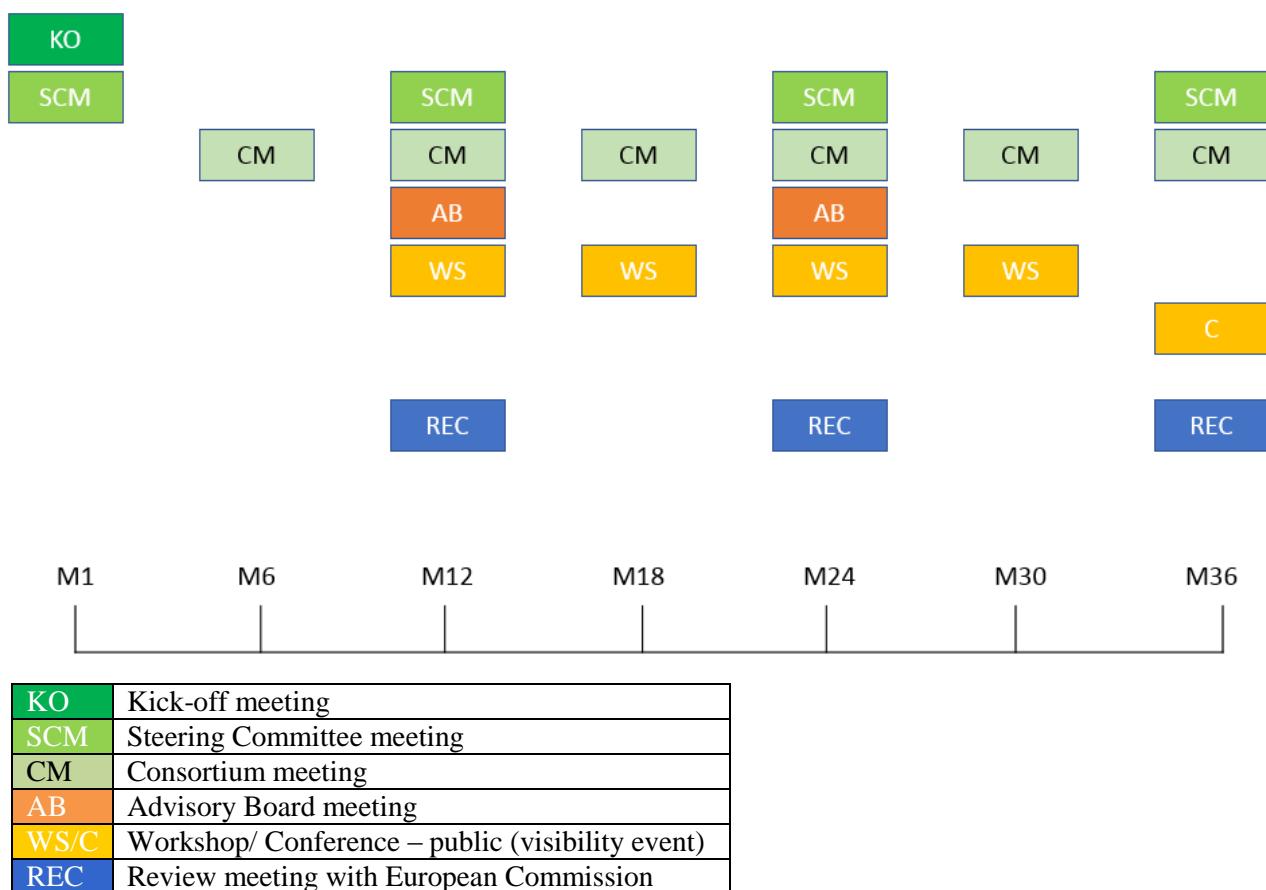
KO	Kick-off meeting
SCM	Steering Committee meeting
CM	Consortium meeting
AB	Advisory Board meeting
WS/C	Workshop/ Conference – public (visibility event)
REC	Review meeting with European Commission

Figure 12. Overview of project meetings dynamics

3.3. Consortium as a whole

The InterPARES Disrupt project brings together experts from both public and private organizations across EU and worldwide. An interdisciplinary team composed of researchers, experts for the analysis of business processes in public sector, information scientists and experts for implementation of digital and disruptive technologies both in the public and private sector will work together to reach the project and Horizon 2020 objectives under topic "DT-TRANSFORMATIONS-02-2018-2019-2020: Transformative impact of disruptive technologies in public services" objectives. Furthermore, for delivering project results, the Consortium members will not only collaborate with each other, but also with the end users of public services, i.e. public servants, citizens using G2C services and representatives of businesses who are using G2B services. Table 13 summarizes the role of each partner in the project and their respective expertise relevant to the Project activities.

Table 13. InterPARES Disrupt project partners and their expertise

Partner	Type of organization	Expertise
University of Zagreb, Faculty of Humanities and Social Sciences, Croatia (FHSS) **Project Coordinator**	University	• Development of user studies, analysis of benefits, risks and impacts of technology • Experience in research and application of machine learning (ML), data preparation and normalization, natural language processing (NLP), blockchain/DLT, gamification, digitisation, document and records management, knowledge management (KM), long-term preservation (LTP) • Experience in research of governmental e-services • Development of models, checklists and methodologies

		• Experience project coordination • Experience in organisation of international conferences and workshops for knowledge dissemination purposes • Development of (online) educational materials and life-long learning programmes • Consulting private IT companies (internationally) • Involvement in ISO standardisation (ISO/TC 307 blockchain and DLT)
Geneva School of Business Administration HES-SO, University of Applied Sciences and Arts Western Switzerland (HEG)	University	• Blockchain algorithmic evidence (including smart contracts) • RDF/ontology • IR, SEO, SMO, data mining • MOOC (Massive Open Online Course) on research data in development • Training catalogue on research data (DLCM project) • Training and consulting in private and public administration
The National Archives, UK (TNA)	Non-ministerial department, the official archive and publisher for the UK Government	• High quality technical solutions for the heritage sector • Information and archival management • Digital preservation • Development and trialling of transformational new distributed ledger technology (DLT) • Experience in machine learning, blockchain, uncertainty
Dedagroup Public Services SRL, Italy (DedaPS)	Private company (IT)	• Experience in developing the Digital Hub solution • Data ingest • Data integration and analysis (specific dashboards)
University College London, UK (UCL)	University	• Experience of working in the public services/policy arena (specifically social care) with both public servant (social worker) and citizen (those with lived experience of out of home care) stakeholders • Expertise in more participatory methods of conducting research
Hacettepe University (HU)	University	• Information asset management analysis and risk assessments • Information evaluation: data mining and text mining applications in data/records centres, archives and social media resources • Disruptive technologies for information formation, organization, distribution and usage • Effectiveness of disruptive technologies on information preservation and security • The relationship between users and archival systems • Digitisation standards and applications within the new technologies • Integration of the content from different archival systems • Digital curation and digital museum management • Geographic information systems
Ernst & Young Savjetovanje d.o.o., Croatia (EYS) **Project Management**	Private company (Consulting)	• Creating customer segments and customer journeys, implementation of websites, applications and products based on those insights • Smart capture, collection, integration and aggregation of data and information using disruptive technologies • Wide experience with gathering, exploring and integrating of data through various technologies, databases and APIs • Data preparation and normalization • AI-based data analysis of structured and unstructured data • Data categorization and classification with help of the

		• supervised and unsupervised machine learning models • IT security governance and project result testing • Piloting and testing different technologies for clients in different industries and sectors • Extensive knowledge and expertise of developing brand identities, marketing strategies and UX/UI driven web development projects • Development of digital, marketing and communication strategies • Experience in project management, grant contract management for EU co-financed projects
University of Macerata, Italy (UniMC)	University	• Center of National academic research on digital records management and digital preservation methodologies and practices in Italy, collaborating with National Association of Italian Archives (ANAI) and the hugest Italian best practices • Management of several researches on Access behaviours and theoretical implications • Machine learning, natural language processing • Development and implementation of websites, repositories and e-Learning environment
Enigio Time AB, Sweden (ETS)	Private company (IT)	• Experience in cryptographically securing that born-digital data cannot have been created at an earlier time and that it cannot have been changed after that time (using linked timestamping as well as blockchain and DLT principles) • Experience in securing digital data-streams and making sure they are intact and in real time • Developed method for binding digital data to physical events and the opposite • Experience in creating cloud-based eArchive solutions integrated with time:beat timestamping and aggregation in other blockchains like Bitcoin and Ethereum • Experience in international research project • Successful experience in patenting own solutions in Sweden and the US
City Council of Girona, Spain (CCG)	City	• Expertise in analysis of processes in public administration • Analysis of benefits, risks, impact of technology • Records management and developing of a records management system • Developed an appraisal model for retention and selection, but also related to access, privacy, transparency or open data
University of Geneva, Switzerland (UNIGE)	University	• AI, information retrieval (IR), natural language processing (NLP), medical informatics • Information quality assessment tools, methods • Appraisal and classification processes design, tools, standards and approaches • Systematisation and semi-automation of archival processing in Public Administration • Research data management services and tools • Digital public records services • Risk management & information assets • Developed a proof-of-concept-based on blockchain for certifying documents • Developed an RDF-based platform for digital humanity collections • Organization of conferences and writing papers

The InterPARES Disrupt project also involves the International Partners. They will take active role in the project research with in-kind contribution free of charge and will search for the co-funding opportunities in their respective countries (Table 14).

Table 14. InterPARES Disrupt International Partners with in-kind contribution matrix (technology expertise perspective)

Partner	Type of organization	Expertise
University of British Columbia, Canada (UBC)	University	• The partner has led previous 4 phases of the InterPARES projects for 20 years • Primary source of information about InterPARES findings, and the theory and methodologies that new technologies may disrupt • Experience in research on records in the cloud, records management, archiving, managing records in financial markets • Building presence in the blockchain & fintech and establishment of a blockchain research cluster • Development of (online) educational materials • Lead partner in development of Computational Archival Science (CAS) • Consulting international financial institutions in the area of digital records management, big data and visualisation as well as private IT sector • Experience in research on the impact of blockchain/DLT to transparency, financial stability, public accountability and human rights and its application to healthcare and public land registries • Information security expertise
University of Brasilia, Brazil (UnB)	University	• Expertise in founding and supervising IT startups • Experience in automated text clustering, semantic web, construction of domain ontologies, analytics for market intelligence • Research in blockchain/DLT, big data and IoT • Software development

The InterPARES Disrupt project will also associate with the third parties (institutional and individual experts) with in-kind contribution to InterPARES Disrupt project. These third parties will be associated with two of the main partners as shown below (Table 15).

Table 15. InterPARES Disrupt associated third parties contribution matrix (technology expertise perspective)

Partner	Type of organization	Expertise
Highflott d.o.o., Croatia (HFT) - 1 individual expert – associated partner to Faculty of Humanities and Social Sciences, Croatia	Private company (RM & IT consulting)	• Expertise in archival standards (ISAD(G), ISAAR CPF, OAIS, PAIS, METS, PREMIS) • ICT implementation of various archival processes • Expertise in development of digital archival information system • Expertise in digitisation • Expertise in development of personal digital archiving service • Experience in development of (online) educational materials • Experience in research in international projects

Israel State Archives, Israel (ISA) - 1 individual expert – associated partner to Faculty of Humanities and Social Sciences, Croatia	Government institution	- Development of archival management system - Experience in research in international projects - Analysis of users' data - Development of retention and disposition processes and metadata description schemes for governmental websites - Thesauri construction
Silvia Schenkolewski-Kroll, Israel (SSK) - 1 individual expert – associated partner to Bar-Ilan University, Israel	Individual expert	- Experience in analysis of user behavior in using governmental e-resources - Development of methodology, together with the Israeli State Archives, for retention and disposition processes and metadata description schemes for governmental websites - Digital preservation - Experience in development of (online) educational materials - Experience in research in international projects
University of Bologna, Italy (UniBo) - 1 individual expert, associated partner of University of Macerata, Italy)	University	- Impact of digital technologies to public administration - Preservation of social media - Research centre on artificial intelligence (AI) - Experience in development of (online) educational materials - Experience in research in international projects

The InterPARES Disrupt project partners have the necessary technological expertise in order to carry out the research. Table 16 outlines partners' expertise in the technologies which will be investigated and piloted in the project. Each partner has expertise in at least two groups of disruptive technologies.

Table 16. InterPARES Disrupt project partner contribution matrix (technology expertise perspective)

Participant No.	Participant acronym	AI & Machine Learning	Blockchain & DLT	Big Data Analytics & Visualisation	Intelligent Automation & Algorithmic Techniques	Simulations (VR/AR/MR) & Gamification
1	FHSS	✓	✓			✓
2	HEG	✓		✓	✓	
3	TNA	✓	✓		✓	
4	DedaPS	✓	✓	✓		✓
5	UCL	✓			✓	
6	HU	✓		✓		
7	EYS	✓	✓		✓	✓
8	UniMC	✓				✓
9	ETS		✓		✓	
10	CCG	✓	✓			✓
11	UNIGE		✓	✓		
International partners						
12	UBC		✓	✓	✓	
13	UnB	✓	✓			
Third parties						
14	HFT			✓	✓	
15	ISA	✓		✓		
16	SSK	✓		✓		
17	UniBo	✓		✓		

Table 17 shows where the partners' contribution lays in terms of theoretical knowledge, technical knowledge or testbed possibilities.

Table 17. InterPARES Disrupt project partner contribution matrix (areas of expertise)

	Theoretical / academic knowledge *(can contribute to the analysis of benefits, risks, impact etc. of the disruptive technology)*	**Technical knowledge** *(can develop, pilot or implement the technology)*	**Testbed possibilities** *(can provide training sets, testing environments, existing solutions, or possible case studies for piloting and training purposes)*
AI & Machine Learning	FHSS, HEG, TNA, EYS, UCL, HU, UniMC, *UnB, ISA, UniBo, SSK*	HEG, TNA, DedaPS, EYS, *UnB*	HEG, TNA, CCG, *ISA*
Blockchain & Distributed Ledger Technologies	FHSS, TNA, CCG, UNIGE, *UBC, UnB*	TNA, EYS, ETS, UNIGE, *UBC, UnB*	TNA, DedaPS, EYS, ETS, CCG, UNIGE, *UBC, ISA*
Big data analytics & visualisation	HEG, HU, UNIGE, *UBC, ISA, UniBo, HFT, SSK*	HEG, HU, EYS, *UBC*	HEG, DedaPS, *ISA*
Intelligent automation & Algorithmic techniques	HEG, UCL, TNA, EYS, *UBC, HFT*	HEG, TNA, EYS, ETS, *UBC*	HEG, TNA, ETS
Simulations (VR/AR/MR) & Gamification	FHSS, EYS, UniMC, CCG	DedaPS, EYS, UniMC	DedaPS, EYS, CCG

Note: International partners and third parties are shown in italics

The results of research, piloting and testing of use cases will be available to the public authorities and they could serve as a **basis for further implementation of disruptive technologies in the public e-services**. Moreover, the project results that will be obtained from the use cases could also be implemented to the existing e-services. In this way there will not be a need to pilot and test the same e-services twice, but the project results could be implemented in practice. If successful, the same approach could be used in the analysis of the remaining e-services out of the representative basket of 20, as well as in analysis of many other that exist. The piloted solution for application of disruptive technologies could be directly applied to many e-services and their processes. The developed best practices and policy recommendations for domain-based implementations of public e-services in the context of disruptive technologies could be directly used in any relevant situation in public administration and elsewhere.

3.4. Resources to be committed

The number of person/months over the whole duration of the planned work, for each work package, for each participant is shown in the Table 18.

Table 18. Summary of staff effort

	WP1	WP2	WP3	WP4	WP5	WP6	WP7	Total Person-Months per Participant
FHSS	35.9	13.8	17.8	7.8	28.2	5.2	8.8	**117.5**
HEG	3.4	39.5	0.0	0.0	7.9	1.4	0.0	**52.2**
TNA	11.5	0.0	57.6	46.1	0.0	0.0	0.0	**115.2**
DedaPS	7.1	4.0	4.0	25.5	2.5	2.3	0.0	**45.4**
UCL	2.0	0.0	0.0	0.0	10.1	13.1	0.0	**25.2**
HU	11.0	0.0	0.0	8.0	20.0	34.0	0.0	**73.0**
EYS	20.7	9.5	9.5	15.8	10.3	2.2	54.0	**122**
UniMC	9.5	8.0	8.0	7.5	15.5	4.0	0.0	**52.5**
ETS	3.3	4.2	4.2	42.5	3.0	2.0	0.0	**59.2**
CCG	2.2	2.6	2.3	1.4	0.7	2.5	0.0	**11.7**
UNIGE	2.7	1.5	2.3	21.9	4.0	0.0	0.0	**32.4**
Total Person Months	**109.3**	**83.1**	**105.7**	**176.5**	**102.2**	**66.7**	**62.8**	**706.3**

There are some partners for which the sum of the costs for 'travel', 'equipment', and 'goods and services' exceeds 15% of the personnel costs for that participant (according to the budget table in section 3 of the proposal administrative forms). Breakdown of *Other direct costs* for these participants is shown in Table 19.

Table 19. 'Other direct cost' items (travel, equipment, other goods and services, large research infrastructure)

Participant number 1: FHSS	Cost (€)	Justification
Travel	115,500.00 €	FHSS is the Project coordinator and, thus, has overall responsibility for project coordination, communication and dissemination. This requires full presence of all FHSS members at all project meetings, conferences and project coordination events of any kind. (a) It is calculated that 5 experts that will work on InterPARES Disrupt project will participate in project meetings envisaged in the beginning of the project and every 6 months of the project. This results in the following calculation: **35 travels x 1,400.00 € = 49,000.00 €** (b) There are 3 meetings with the European Commission representatives planned throughout the project duration for purpose of project implementation monitoring and checks. It is envisaged that one or two people from FHSS will attend these meetings. This results in the following calculation: **5 travels x 1,400.00 € = 7,000.00 €**

		(c) There are 3 third parties with in-kind contribution and 2 International Partners which will participate in implementation of InterPARES Disrupt project as explained in chapter 3.3. All their travels and accommodation will be covered by FHSS and it is envisaged that they will participate in some of the project meetings and dissemination events and in others they will participate on-line. There are in total 20 travels planned for these experts which results in the following calculation: **20 travels x 1,400.00 € = 28,000.00 €**
		(d) There is a sum planned for purpose of dissemination activities which includes participation of FHSS in various events, conferences and seminars as well as presenting the InterPARES Disrupt project in these events. The sum amount planned for these purposes is **31,500.00 €**.
Equipment	-	
Other goods and services	-	
Total	115,500.00 €	

Participant number 4: DedaPS	Cost (€)	Justification
Travel	42,000.00 €	DedaPS will finance cost of travel for their experts and costs for cloud and hosting of the Digital Hub which will be used as a common logical and technological infrastructure to compare the pilot's results, as explained under WP4 description.
		(a) Travels are envisaged for project meetings and coordination as well as for work under WPs and dissemination events. Not all engaged experts will participate in all meetings and events. Therefore, the cost calculation for travels is as follows: **34 travels x 500.00 € = 17,000.00 €**
		(b) Costs for cloud and hosting of the Digital Hub are planned to a sum of **25,000.00 €**.
Equipment	-	
Other goods and services	-	
Total	42,000.00 €	

Participant number 5: UCL	Cost (€)	Justification
Travel	38,391.00 €	UCL plans to finance cost of travel for their experts and costs for Open Access charges (Article Processing Charges – APC) and printing of dissemination materials, as the lead partner for WP5. (a) Travels are envisaged for project meetings and coordination as well as for work under WPs and dissemination events. Not all engaged experts will participate in all meetings and events. Therefore, the cost calculation for travels is as follows: **13 travels x 642.50 € = 8,352.50 €** (b) Costs for Open Access charges and printing of project dissemination materials are summed up to **30,038.50 €**.
Equipment	-	
Other goods and services	-	
Total	38,391.00 €	

No large research infrastructure will be used for purpose of this project.

Participant Number/Short Name	Cost (€)	Justification
Large research infrastructure	-	Not applicable

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