The Once-Only Principle Project

Position Paper on Definition of OOP and Situation in Europe (updated version)

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Abstract:

The once-only principle (OOP) is a principle which states that public administrations should collect information from citizens and businesses only once, and then share and reuse this information. This is seen as a way to increase government efficiency and reduce the administrative burden of citizens and businesses in their interactions with public administrations. In the context of the European Single Market, data should not only be shared internally within a country but also between Member States. In spite of political expectations and technical advances, the cross-border implementation of the OOP in the EU has been limited to a few services so far. The Once-Only Principle Project (TOOP) is an EU-funded large-scale project which aims to explore and demonstrate the OOP on a cross-border pan-European scale, focusing on reducing the administrative burden of businesses. This will be achieved by developing a federated architecture for interconnecting information systems in different countries, and testing this in multiple pilots. TOOP has the potential to provide lessons learned which may assist future implementation and a wider usage of the OOP. This is expected to bring positive changes both for public administrations and public service users across Europe and beyond. This position paper describes the current state of affairs as regards the implementation of the OOP in Europe and explains the project's approach towards OOP, summarizing the motivation and ambition behind the project.

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List of Abbreviations

Acronym	Explanation
BRIS	Business Register Interconnection System
CEF	Connecting Europe Facility
DSI	Digital Service Infrastructure
EBR	European Business Register
EC	European Commission
EIF	European Interoperability Framework
EIRA	European Interoperability Reference Architecture
EU	European Union
FSOD	Framework for Supporting OOP Project Development
LSP	Large Scale Pilot
OOP	Once-Only Principle
TOOP	The Once-Only Principle Project
XML	eXtensible Markup Language

Executive Summary

The objective of this position paper is to explain the once-only principle (OOP) as it is understood by the partners in **The Once Only Principle Project** (hereinafter "**TOOP**", 2017-2019), and to summarize the motivation and ambition behind the project. This deliverable is an update of TOOP Deliverable 2.6 from April 2017.

OOP is a principle that puts forth the idea that public administrations should collect information from citizens and businesses only once and then share and reuse the information that has already been collected, keeping in mind legal requirements and restrictions. This principle aims to reduce the administrative burden of individuals and businesses by re-organising public sector internal processes, rather than making individuals and business users adjust to existing processes.

The EU-wide implementation of the OOP is a political priority. Large-Scale Pilots have already been implemented within Europe, technical building blocks have been developed and piloted in various domains, and interoperability standards and frameworks have been developed. However, while many European Union (EU) countries have started to implement the OOP at a national level, the cross-border implementation of the OOP is so far limited to a few services.

TOOP aims to explore and demonstrate OOP on a European scale by using a federated architecture to implement multiple cross-border pilots. **TOOP's approach to the OOP** is specific, focusing on information related to **businesses** activities and on **cross-border** sharing of this information. TOOP aims to contribute to a situation where businesses could provide certain standard information to a national or supra-national public administration only once, and this information could be shared between those public bodies, based on the data subject's consent and relevant privacy legislation.

Three pilots will be implemented in the following areas: (1) Cross-border e-Services for Business Mobility, (2) Updating Connected Company Data, and (3) Online Ship and Crew Certificates.

One of the key innovative solutions to be developed within TOOP is a **generic federated architecture** that supports the organisational, semantic and technical interoperability of national registries across state borders. Such an architecture aims to provide consolidated and reusable building blocks for the implementation of the OOP in public services within Europe.

The project also works to identify and mitigate **barriers** and **legal issues**, which is not only necessary for the correct execution of the pilots, but may also provide guidance for future legislative or policy measures in the EU and beyond. The pilots will be **evaluated** to identify the tangible and intangible benefits and impacts of the cross-border implementation of OOP and generate lessons learned that could help introduce OOP-based initiatives in the future.

Exploring and demonstrating the functionality of the OOP on a cross-border European scale may bring positive changes both for public administrations and public service users across Europe and beyond. The exercise that TOOP is undertaking will give valuable insights into how the OOP could be extended, what the drivers and barriers are, and which obstacles need to be overcome to make the OOP a reality throughout Europe. The project is thus an important learning environment for the OOP in particular and European e-Government in general.

1. Introduction

The objective of this position paper is to articulate how the partners of **The Once-Only Principle project** (**"TOOP"**, 2017-2019) understand the **once-only principle (OOP)** and, secondly, it aims to summarize the motivations and ambitions behind the project. This position paper will give a brief overview of the current political context and existing OOP initiatives in Europe, describe areas where this principle will be piloted in the framework of TOOP, and provide details on the implementation of the project.

The OOP is a principle that posits that public administrations should collect information from citizens and businesses only once and then share and reuse this collected information while keeping in mind privacy regulations and other constraints. The application of this principle provides an effective means for the reduction of administrative burden for companies in their reporting duties towards the government and in procedures such as public procurement where companies need to prove the possession of certain licences or mandates. In the context of the EU single market, it has become necessary to allow such sharing and reuse of information at the cross-border level as well. This means that if one public authority in an EU Member State has collected certain data about a company, all other EU Member States should be able to access and reuse this data. The implementation of the OOP at the EU level will save citizens and businesses time and money by eliminating multiple requests for previously provided information.

The aim of TOOP is to explore and demonstrate the application of this principle at a cross-border scale. Being the first initiative of this scale, TOOP is expected to create evidence on various issues surrounding the cross-border implementation of the OOP and its impacts. The project's real-life pilots should provide valuable insights into any future implementation of the OOP within the EU. TOOP also analyses the legal context of the OOP and contributes to shaping the EU legal landscape on this principle.

This position paper is divided into four main chapters. After the current introduction, Chapter 2 will describe the political context, benefits and barriers associated with the OOP, and will also give an overview of selected OOP initiatives within Europe paying special attention to cross-border initiatives in the field of business data. In Chapter 3, TOOP's ambition and innovation potential will be described, demonstrating the aspects where it aims to go beyond the state-of-the-art. Also, TOOP pilot areas will be discussed and some general information about the implementation of the project will be provided. Conclusions will be provided in Chapter 4.

This deliverable is an update of TOOP Deliverable 2.6 from April 2017. This updated version reflects the developments in the project and its context and addresses the recommendations from the TOOP interim review (28 October 2017). It draws on the work done in Task 2.3 (Drivers and barriers) and several related tasks in the project, including the technical (T2.1) and legal (T2.2) aspects of OOP as well as the impact evaluation (T2.4).

2. The Once-Only Principle

Political Context

The European Union (EU) strives to further develop the common (digital) single market by reducing the administrative burden for citizens and businesses. In 2009, the ministers of the EU Member States agreed upon a Ministerial Declaration on e-Government[1] to reduce administrative burden, one way to do this is through adjusting administrative processes and applying the OOP.

The EU-wide implementation of the OOP is also a main pillar of the Digital Single Market Strategy. The new "eGovernment Action Plan 2016-2020"[2] calls for the implementation of the OOP; it also calls for a European free flow of data initiative and improvement of the European Interoperability Framework. One of the underlying principles of the Action Plan is that public administrations should ensure that citizens and businesses supply the same information only once to a public administration.

Moreover, the most recent ministerial declaration on e-Government from 6 October 2017[3] explicitly mentions cross-border OOP as one of the focus development areas. With this declaration, ministers committed to:

> *take steps to identify redundant administrative burden in public services and introduce once only options for citizens and businesses in digital public services by collaboration and data exchange across our administrations at national, regional and local level as well as with other countries for cross-border digital public services;*

> *take steps to increase the findability, quality and technical accessibility of data in key base registers and/or similar databases, to build up readiness for applying the once only principle for national or cross-border digital public services;*

> *work to create a culture of re-use, including responsible and transparent re-use of data within our administrations;*

> *make use of available funding to digitise all necessary key data and implement data exchange services between administrations for applying once only on both national and/or cross-border levels.*

In order to improve the cross-border provision of public services, several Large Scale Pilots (hereinafter LSPs), such as e-SENS[4], STORK[5] and eCodex[6], have already been implemented in Europe. These LSPs have facilitated the use of innovative technologies for the deployment of EU-wide services in selected areas, demonstrating that cross-border service provision can be made simpler. In numerous domains, technical building blocks[7] have been developed and piloted to enable the provision of seamless cross-border services. Existing interoperability standards and frameworks, the Digital Service Infrastructures (DSIs) of the Connecting Europe Facility (CEF), the building blocks of the LSPs, and the solutions offered under the ISA^2 Programme[8] all facilitate the further development of the OOP in Europe.

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[1] https://ec.europa.eu/digital-single-market/sites/digital-agenda/files/ministerial-declaration-on-egovernment-malmo.pdf
[2] http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52016DC0179
[3] http://ec.europa.eu/newsroom/document.cfm?doc_id=47559
[4] See https://www.esens.eu
[5] See http://www.eid-stork2.eu
[6] See https://www.e-codex.eu
[7] See https://ec.europa.eu/cefdigital/wiki/display/CEFDIGITAL/CEF+Digital+Home
[8] See https://ec.europa.eu/isa2/home_en

In addition to the technical efforts, the EU has also granted funding to initiatives exploring the OOP in cross-border settings via the dedicated Horizon 2020 call "Co-creation between public administrations: once-only principle" (H2020-SC6-CO-CREATION-2016-2017), where funding was allocated to TOOP as well as to SCOOP4C[9]. Furthermore, the EC has proposed a regulation on establishing a Single Digital Gateway (SDG)[10]. The SDG constitutes a single entry point through which citizens and business should be able to access information about the rules and requirements they have to comply with in various EU countries, as well as access a number of key procedures which the Member States will be required to provide online. §12 of the SDG regulation highlights "the use of the once-only principle for the purpose of the exchange of evidence between competent authorities in different Member States". TOOP is expected to deliver the technical system for its implementation as one of its results.

Benefits

The OOP is seen as a viable way to reduce the administrative burden in the EU member states and make the digital single market a reality. This is based around the assumption that collecting information is more expensive and burdensome than sharing information that has already been collected. Both the administration storing the data and the administration using the data may see an opportunity to streamline their processes: first, to enable automated data-sharing and second, to replace redundant data collection with information requests.

The use of the OOP is associated with a number of benefits. According to Gallo et al. (2014), countries implementing the OOP see cost savings, time savings, improved service quality and administrative efficiency as the main benefits to be realized. The analysis undertaken by TOOP (D2.9, 2017) found that the key benefit expected from implementing the OOP in the field of business data is administrative burden reduction for businesses, including time-savings and reduced administrative costs which frees up time to focus on companies' core business.

There is also a potential for major gains for public administrations in the form of fewer calls to customer service centres, less paper mailing, faster processing, time-savings due to a decreased need for data collection, improved re-utilisation of data and a reduced number of unnecessary data submission demands. The implementation of the OOP may lead to process optimization in governments and remove the duplication of some tasks. This would be seen as costs savings and a reduction of the number of errors made in administrative procedures.

In addition to efficiency-related benefits, cross-border OOP implementation is also expected to improve the quality of public services. One particular benefit is non-discrimination, which can be achieved by reducing asymmetries between the treatment of domestic and cross-border individuals and businesses seeking services that require them to submit information to public authorities. Better public value delivery can in turn improve the legitimacy, transparency and accountability of public administrations.

Barriers

While the implementation of the once-only principle has been associated with significant potential benefits, the adoption of the OOP on the cross-border level is packed with challenges of different kinds. According to the analysis carried out in the TOOP project, current barriers that complicate the

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[9] See https://scoop4c.eu
[10] See https://ec.europa.eu/info/law/better-regulation/initiatives/com-2017-256-0_en

implementation of the OOP come from legal, technical, organisational, political and demand-side issues.[11]

In regards to legal challenges, the key barriers are associated with ensuring the lawfulness and compliance (an adequate legal basis for the OOP) and the legal value and validity of the data exchanged. Equally important concerns are related to privacy and data protection of natural persons as well as protecting confidentiality and business secrecy.[12]

From a technical point of view, the realisation of the OOP is related to the interconnection of (base) registries. Such registries are the consolidated source of information for certain domains, such as business, buildings, persons, etc. For example, the national business registry of each country is the base registry for company information of all businesses in that country. The OOP foresees the use of such registries as information sources, as they should always keep the latest version of information. However, the interconnection of heterogeneous information systems entails major technical challenges. Furthermore, public administrations are generally not willing to undertake substantial technological changes in order to enable the OOP at a cross-border level. This means that the cross-border interconnection of local databases needs to ensure a very high level of compatibility with the existing technical solutions at national and organisational levels.

Regarding the drivers of cross-border OOP, end user benefits – administrative simplification and efficiency for businesses – are perceived as the most important driver. However, uncertainty about the number of potential end users and concerns about low take-up may constitute a barrier that makes governments cautious about the OOP. Thus, in the development of the OOP, priority should be given to developing services that would benefit a larger number of end users, or bring considerable benefits to certain groups of users. This also implies the need for ex-ante impact assessments of concrete services to be developed as well as ex-post impact assessments to document the benefits and impacts and derive recommendations for further development and scaling up.

Finally, there are several organisational and political factors that act as barriers to OOP implementation. These relate to organisational inertia and reluctance to change, low political prioritisation of the OOP in Member States, the difficulty of balancing the interests of multiple stakeholders, limited resources, organisational interoperability, and different data pricing policies.

OOP Applications in Europe in the Field of Business Data

National efforts

The OOP has become an important principle in administrative modernisation processes throughout Europe. According to a report by Gallo and colleagues (2014), 25 European countries had started to implement the OOP at some level, and 13 had legislation in place supporting the implementation of the OOP for businesses and/or individual citizens. A more recent report on the OOP in Europe concludes that "the implementation of the OOP throughout European Member States is still evolving and fragmented; experience with cross-border implementation is limited to a few services and cross-border arrangements between individual Member States. Thus, it is not yet a principle" (Cave et al. 2017). Hence, while there seems to be a movement towards a more widespread implementation of the principle, not much is yet there at the cross-border level.

One of the challenges for the cross-border implementation of the OOP is national differences in how the OOP is defined and the level at which it is in use in different countries. According to the study by

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[11] See TOOP D2.7: http://toop.eu/sites/default/files/D27_Drivers_and_Barriers.pdf
[12] See TOOP D2.5: http://toop.eu/sites/default/files/D25_legal_landscape_and_regulations.pdf

Cave et al. (2017), Estonia, the Netherlands and Belgium are currently considered to have the most mature OOP infrastructures – all three countries have national legislation in place that not only explicitly refers to the OOP but also enforces its implementation. In these countries, public administrations are encouraged or even obliged to retrieve data from the registers in which they are already stored instead of duplicating data requests and storage.

In **Estonia,** the OOP is a universal principle applied in most administrative procedures. Several key preconditions, including legal, administrative and technical, are fulfilled. Since 2007, the Public Information Act prohibits the establishment of separate databases for the collection of the same data (Estonian Public Information Act, § 43). Also, the General Part of the Economic Activities Code Act (2011) establishing the general conditions and procedures for exercising the freedom of economic activity states that economic administrative authorities are prohibited to require companies to provide information that is already entered in a public database. The prohibition also applies to information which can be obtained from the relevant register of another Contracting State (§ 13).

Other preconditions for the OOP include the existence of unique identifiers for citizens and companies and the technical interconnection of registers via the X-Road data exchange system, which allows harmonized data exchange between close to a thousand public organisations. The OOP-based exchange of data is widely applied in Estonia (within public administration, but also extending to private sector), resulting in administrative burden reduction, increase in government efficiency and end-user satisfaction (Kalvet et al. 2013).

In the **Netherlands**, the OOP is applied in several areas. The *Stelsel van Basisregistraties* (System of Base Registers) was established in 2003 and includes 12 base registers, containing general information about companies and individual persons such as business names, personal addresses, cadastre information, income, vehicle registration information, etc. This allows businesses and citizens to only provide these data once. The system includes open registers that are publicly accessible as well as closed registers where information is only accessible by those who need it for their work (Website Dutch Government 2017).

Regarding OOP for individual citizens, the Dutch Tax Office (*Belastingdienst*) introduced prefilled tax declaration reports in 2014 and made this the default standard in 2016. As tax data from different databases is automatically combined and added to the tax forms, users no longer have to fill out tax forms manually, making reporting much easier and faster (Consumers Union 2017, Tax Office 2017). The OOP is also applied in the *Elektronisch Patiënten Dossier (EPD,* Electronic Patient Record), allowing caregivers to ask other care providers for patient information through a national exchange point. Information can only be accessed if patients have given their consent up front. Patients can see their file online (the authentication is done by eID) and give permission of access to care providers.

Belgium adopted a dedicated OOP law in 2014.[13] The law requires federal public administrations to retrieve all available data from official registers using unique identifiers, instead of asking citizens and businesses to provide these data multiple times. The implementation of the law is facilitated by the system of base registries and the eID system, which provides a single identifier for each data holder, whereby public administrations can exchange data and individuals and businesses can access public e-services. A number of official service integrators have been appointed by law to facilitate access to the base registries both at the federal and regional level. These service integrators function as a single point of contact for data consumers. The system also allows citizens to always know which organisation has accessed their data.

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[13] http://www.ejustice.just.fgov.be/cgi_loi/change_lg.pl?language=fr&la=F&cn=2014050506&table_name=loi

Regarding services for businesses, a number of common transactions (e.g. registering a company's name and address, withholding taxes and social security contributions from wages, etc.) can be completed online using prefilled forms. The administrative burden of starting up a business has also been reported as being minimal due to the extensive reuse of data existing in public sector databases (see Cave et al. (2017) for a more detailed overview of OOP services in Belgium).

In addition to efforts at the federal level, Belgium's region of Flanders has been using the service integrator's platform MAGDA (Maximum Data Sharing between Administrations and Agencies) since 2004-2005, which provides a common service-oriented data exchange infrastructure for the 190 agencies and 13 departments of the Flemish regional government and 308 local governments[14]. The platform allows for the retrieval of data from federal and Flemish base registries and the exchange and reuse of data in line with the once-only principle. MAGDA currently connects more than 25 data sources and provides more than 75 data services.

Cross-border initiatives

Thus far, only a few cross-border initiatives applying the OOP for businesses have been documented (a few more initiatives exist where the focus has been on sharing and reusing data about citizens but these are beyond the scope of TOOP). Some of them are currently in the planning, some are being piloted and some have been terminated.

In 2013, the state of **Bavaria (Germany) and Upper Austria (Austria)** initiated the cross-border pilot project "X-trans.eu"[15] to assist and innovate the process of applying for and approving of international oversize-load transport. Due to the differences in the application forms and procedures for obtaining permits for heavy transport in different countries, the aim of the pilot was to create a central system that would save companies from submitting multiple applications to different local authorities for the same transport. The central permit portal x-trans.eu allowed applicants to provide their data only once for the specific transport. The collected information would then be shared with relevant agencies in the respective countries based on the application requirements in each country. The basis for the portal was a common data model that included all the information needed for a permit. Rules could then be formulated to describe the information and application formats required in each country. As such, the system was fully scalable to any European country. In the pilot phase, data exchange was successfully tested between Austria and Germany. However, due to organisational and political changes, the project was terminated in 2015.

In 2017, **Finland and Estonia** founded the Nordic Institute for Interoperability Solutions to share data pertaining to citizens and businesses between public administrations. According to the agreement, the main Finnish data exchange solution for public sector organisations, *Suomi.fi-palveluväylä*, was connected to the Estonian national data exchange layer X-Road. *Palveluväylä* is based on the Estonian X-Road technology, and the public sector organisations in Finland have a statutory obligation to use it. The interconnection between the two national data exchange layers enables data sharing between numerous data repositories in both countries. As the first step, the two countries plan to start automated inquiries into each other's population registers in 2018. There is also some interest towards data sharing and reuse from the tax offices.[16] The goal of this project is to move towards the provision of cross-border public services for both citizens and businesses.

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[14] https://joinup.ec.europa.eu/node/159272
[15] http://ec.europa.eu/newsroom/document.cfm?action=display&doc_id=5522
[16] See https://www.ria.ee/en/estonia-and-finland-set-up-a-non-profit-organisation-for-the-development-of-x-road.html

In addition to bilateral initiatives, some pilots have been launched at the EU level. For example, the **eManifest pilot project** was launched in 2016 to test the implementation of the OOP in the field of maritime data. This pilot represents a collaboration between DG MOVE, DG TAXUD, the European Maritime Safety Agency (EMSA) and representatives of maritime and customs authorities of 13 EU Member States and industry associations. The aim of the project is to test procedures that would simplify reporting formalities for maritime transport, facilitating the implementation of Directive 2010/65/EU on reporting formalities. [17] The pilot foresees that data elements submitted by economic operators in the maritime sector could be reported once through a single submission to the national or EU maritime Single Window and subsequently distributed to the competent national authorities.[18]

A relevant EU-level initiative towards the cross-border implementation of the OOP is the **Business Registers Interconnection System (BRIS).** In line with Directive 2012/17/EU, BRIS provides a cross-border cooperation platform for European business registers and acts as a single point of access for the European e-Justice Portal through which citizens, businesses and public administrations can search for information on companies and their branches opened in other Member States. BRIS provides a human interface/search facility to access company data at the EU level, increasing consumer confidence in cross-border transactions; it reduces the administrative burden of businesses in fulfilling cross-border obligations, and increases the legal certainty and efficiency of procedures undertaken by public administrations.[19]

3. The Once-Only Principle Project

Ambition

TOOP is a large-scale cross-border initiative that explores the feasibility of the **once-only principle** at a cross-border scale. TOOP takes a specific approach to the OOP by (1) focusing on **information related to businesses** (i.e. excluding data about individual citizens), and (2) on **cross-border sharing** of this information. TOOP aims to contribute to a future where businesses would need to provide certain standard information to a national or supra-national public administration only once, and this information could be shared and reused by public authorities, respecting legal requirements and constraints.

It is important to note that in some EU Member States OOP is defined in terms of data storage, in which case national legislation requires the collected data to be stored in one database. In other countries, the OOP refers to data collection, stipulating that data should be submitted to public administrations only once, while still allowing for multiple repositories. TOOP uses the latter definition of OOP, focusing on **once-only collection of data** by public sector organisations and subsequent sharing of the collected data across public administrations and country borders.

TOOP aims to work on developing a solution that would enable the exchange of business-related data or documents between public administrations. This is done through four main strands of activities:

1. **Identifying the drivers and barriers**, including **legal challenges**, technical, political, organisational and other issues that affect the cross-border implementation of the OOP, and proposing solutions to manage the challenges and risks;

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[17] See https://ec.europa.eu/transport/modes/maritime/digital-services/e-maritime_en
[18] See https://ec.europa.eu/taxation_customs/sites/taxation/files/2016-ecustoms-progress-report-v1.00.pdf
[19] See https://ec.europa.eu/cefdigital/wiki/display/CEFDIGITAL/2017/09/19/Business+Register+Interconnection+System

2. **Designing a generic federated architecture** which allows for the connection of different registries and the interconnection of e-Government architectures in different countries;
3. **Implementing multiple cross-border pilots** of once-only based e-Government services in fields such as cross-border e-services for business mobility, data exchange between business registers, and ship and crew certificates;
4. **Evaluating the results of the pilots** and conducting a cost-benefit analysis to identify the benefits and impacts and generate insights for the wider use of the OOP.

As one of the first steps, TOOP has studied the **legal issues** and **other barriers** around the implementation of the once-only principle. Legal restrictions may raise a number of issues that need to be identified and mitigated within the TOOP project. This is not only necessary for the execution of the project but also for providing guidance for future legislative and policy measures at the national and EU level. In addition to legal issues, the project explores political, organisational, administrative and demand-side barriers to identify possible challenges for cross-border OOP. The results of the analysis conducted in the first project year will be refined in the end based on actual evidence from pilots.

One of the key innovative solutions being developed as part of TOOP is a **generic federated architecture** that supports the interconnection and interoperability of national registries across state borders. The cross-border exchange and reuse of information requires the information systems of different countries to be interoperable, i.e. able to communicate and cooperate with each other. The TOOP solution aims at interoperability on the organisational, semantic and technical level. The architecture aims to provide consolidated reusable building blocks for the implementation of the once-only principle in public services in Europe.

The TOOP architecture is not being developed from scratch. The reuse of previous work is one of the main principles of the project. The EC has set up the Connecting Europe Facility (CEF) to facilitate the development and implementation of existing building blocks or Digital Service Infrastructures (DSIs). The EC-funded e-SENS project has consolidated a large set of building blocks that were developed as part of previous European LSPs. Finally, the EC ISA programme has also made an effort to define a European Interoperability Reference Architecture (EIRA) with building blocks for the interconnection and interoperability of cross-border government systems. TOOP has used the results of these projects and initiatives as the starting point and will only extend the OOP architecture where new OOP-specific building blocks or specifications are needed.

In addition to the architecture, the project will provide a **framework for supporting OOP project development** (hereinafter FSOD). This framework should provide a common core infrastructure for shared digital systems, technology and processes, which will make building OOP-based applications easier and more efficient. As the generic architecture may be implemented in a number of ways, the FSOD will include a set of specifications and designs for tools that will make creating OOP applications more effective and efficient. The FSOD enables the provision of information about the information systems and databases in different countries that can be used in an OOP-related application, the data that are collected and processed, the services that are available and how they are implemented, and the organisations and persons responsible for the development and maintenance of the information systems. It will also provide information on the legal basis for data processing and the reusable components that ensure the interoperability of information systems, such as XML assets, classifications, dictionaries and ontologies, and other.

The end result of the TOOP architecture is a set of specifications and building blocks that are necessary for each TOOP pilot. Such specifications include the business, information, and technical levels of the building blocks. In order to be useful for direct implementation in the pilots, building block profiles will

be documented that indicate at interface level which elements are used to interact with the building block and which syntax and semantics need to be used. Through **pilots**, the architecture will be tested in real-life settings in the fields of company data, cross-border e-services for business mobility, and ship and crew certificates. As an initiative of some 50 organisations in 20 EU Member States and Associated Countries, TOOP aims to connect 36 information systems as data consumers (i.e. receiving data) and 30 as data providers (i.e. sending data to data consumers) in any-to-any transactions.[20]

Since precise and systematic data could assist the introduction of OOP-based initiatives in the future, the project aims to carry out an **evaluation**, including a cost-benefit analysis of the pilots, to identify the tangible and intangible benefits and impacts and generate insights for the wider use of the OOP.

Pilots

In order to demonstrate the implementation of the OOP in real-world settings, TOOP will conduct several pilots, which allows for testing of the cross-border exchange of company and registry data. Based on their cross-border relevance, estimated feasibility, and potential to reduce administrative burden, three areas were selected for the pilot tests.

The first pilot area – **Cross-border e-Services for Business Mobility** – is composed of different usage scenarios that are of interest to the participating states, such as participation in public procurement procedures across borders, doing cross-border business, and cross-border service provision. It is based on the assumption that government administrations from different countries expose e-services directed at Economic Operators from various countries. During service provision, company-related information is needed. The pilot will show how such information can be automatically retrieved from the Economic Operators' country of origin without the business representative having to enter it again.

According to a first mapping of pilots' expectations (TOOP D2.9), the main benefits expected from this pilot are related to administrative burden reduction for businesses (including improved data quality, cost and time savings), better service quality, increased government efficiency, more transparent processes and an increased use of e-services across borders. At the same time, a number of barriers are seen to affect the feasibility of cross-border OOP in this pilot area (see TOOP D2.7 for a more detailed discussion). Challenges are technical (e.g. semantic interoperability, language and translation issues, absence of unique identifiers of businesses and citizens at the EU level), organisational (interoperability of existing processes and infrastructures used in national administrations), political (the risk of lacking political will), cultural (resistance to change, limited awareness of the benefits of the OOP) as well as demand-related (unclear demand for cross-border OOP and uncertainty about the level of take-up). For the moment, legal issues are seen less of a barrier for this pilot area.

The second pilot area – **Updating Connected Company Data** – foresees a central role for the business registers. At the moment, company data are officially stored in the business register within individual Member States according to requirements of relevant EU regulations and directives as well as national legislation. In particular, the BRIS Regulation (Directive 2012/17/EC) has established cross-border updating rules that regulate exchanges between national business registers in order to align data on shareholding companies involved in cross-border mergers or with branch offices abroad. The update notification service shifts the burden of reporting changes from the companies to the business registers. However, companies often deal with foreign public authorities other than the business registers. These include national and local agencies handling sector-specific trade registers and agencies ensuring compliance with specific national and EU regulations, for example in the areas of health, energy, the environment, labour, justice, etc. This means that information on companies is

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[20] These figures indicate the participating countries' intentions as of December 2017.

supplied to and stored by a number of public agencies, as well as by the base registers. Supplying the information and keeping it up-to-date creates significant burdens for the companies and challenges for the administrations involved. TOOP responds to these two needs with services for accessing business register data when needed: 1) on demand, or in "pull" mode, and also through a change notification service by subscription, or 2) in "push" mode – triggered by company "life event" changes which by law must be communicated to the base register. The change notification service will extend the existing BRIS updating service, and will build on "Event Notification Services" currently available in several MS.

The benefits expected with this pilot area are similar to those of the cross-border e-services pilot area. In addition to the benefits mentioned above, the cross-border application of the OOP in the area of connected company data is also expected to contribute to fraud reduction, more accurate processing of cases and more secure registration processes for companies. The barriers are also similar. However, some additional challenges stem from the existing commercial policies and data pricing models of business registers, which is seen as a potentially significant barrier to the availability of data.

The third pilot area – **Online Ship and Crew Certificates** – addresses the need for simplification in the area of ship and crew certificates, which are currently issued and maintained in paper format and stored by national Maritime Administrations. TOOP aims at connecting the databases of national Maritime Authorities and to make the information available to authorised parties, as well as provide a possibility of online certificates, which will substitute paper-based or electronically-signed certificates that have to be carried on board. Once the TOOP solution is implemented, the flag state's Maritime Authority will be able to issue online ship or crew certificates, while all other interested parties, such as port authorities, police and border guard, will be able to view and check the online certificates.

Regarding the expected benefits, this pilot area is different from the other two in its scope and ambition. The implementation of the OOP in the area of ship and crew certificates is expected to contribute to administrative burden reduction and government efficiency by turning a paper-based procedure into an online procedure, saving companies from the need to carry paper certificates on board and speeding up the work of port authorities. This is expected to decrease the delays of ships as well as reduce fraud and mistakes by eliminating the possibility for certificates with outdated or incorrect data. However, the global nature of the maritime sector makes it challenging to reach the expected benefits – real benefits will only start to manifest if the TOOP solution is adopted by a critical mass of users, not only in Europe but in flag states around the world. As ship and crew certificates may also include sensitive or confidential data, legal constraints at the national level are seen as one of the issues that may prevent a quick scale-up of the solution.

Overall, the implementation of these pilots will help to generate valuable insights into the benefits and challenges related to cross-border data sharing and reuse. The pilots demonstrate how the OOP could be extended to cross-border transactions, help identify the drivers and barriers that affect the implementation of the principle, and point to obstacles that need to be overcome. The project is thus an important learning environment for the OOP in particular and European e-Government in general. The pilots are expected to be scalable to other EU Member States in subsequent years. Through the architecture and the lessons learned from the pilots, TOOP aims to help reduce the cost of future e-Government pilots and the setting up of OOP-based services. TOOP also aims to give a contribution to European frameworks, standards and guidelines derived from pilots via integration with the OOP federated architecture.

Implementation

TOOP's implementation follows a holistic pilot life-cycle-based approach. The main focus of the project is on the pilots, which are developed in an agile manner. The planning and implementation of the pilots is supported by the development of a generic federated architecture and building blocks as well as identification and mitigation of barriers (including legal issues) and evaluation of the results. This allows for pro-active dissemination and sustainable exploitation of the results throughout the project. As different pilots will proceed at different speeds, a continuous mechanism for monitoring, risk assessment and mitigation is needed to ensure that pilots will remain on track and will deliver the expected results in line with their stated goals and stakeholder expectations.

TOOP is carried out by a consortium of 50 organisations, consisting of public administrations, companies and research partners. While public administrations carry out the pilots, research partners and other stakeholders are engaged in the development of the federated architecture and the analysis and evaluation activities. The consortium comprises 18 different EU Member States and 2 Associated Countries (see Figure 1).
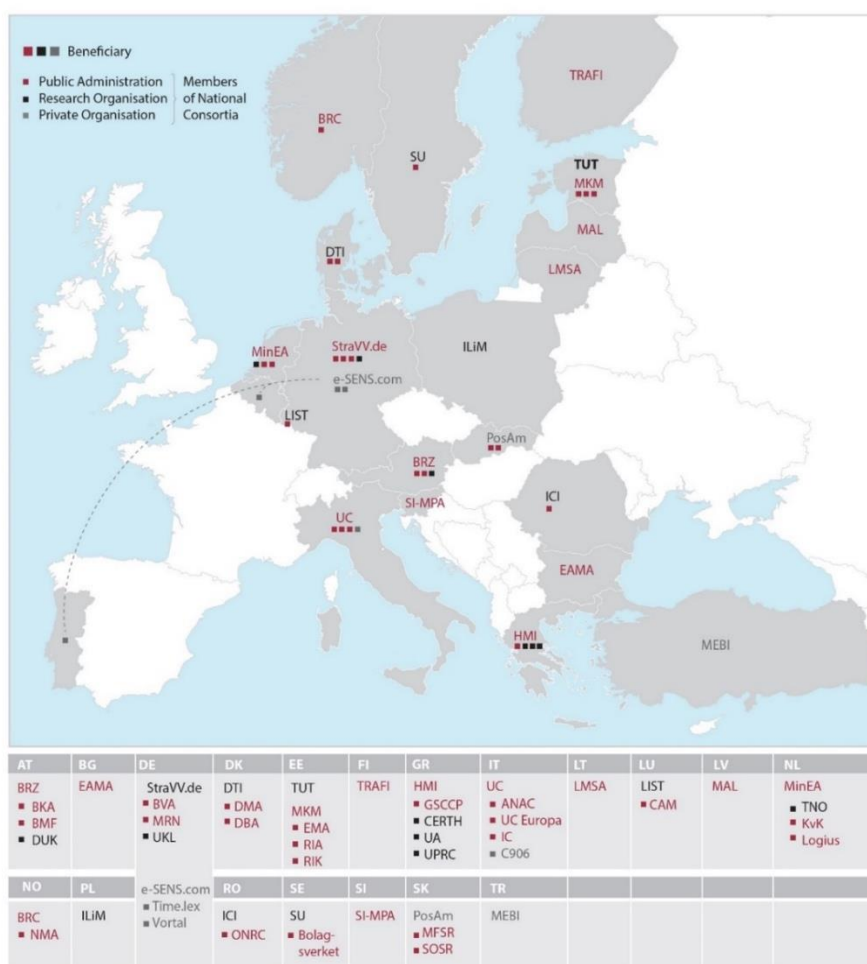

Figure 1. TOOP consortium

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4. Conclusions

The OOP is seen as a viable way to increase administrative efficiency and effectiveness in the EU Member States and to make the digital single market a reality. The OOP is expected to reduce the administrative burden for businesses, increase government efficiency and improve the quality of public services. However, the cross-border implementation of the OOP is packed with challenges, ranging from technical issues to legal, organisational, political and demand-side barriers.

As of the end of 2017, the European Commission and EU Member States have intensified their efforts to remove obstacles to the cross-border implementation of the OOP. The European Commission particularly emphasizes the need to overcome the existing technical and legal barriers.

TOOP is a large-scale EU-funded initiative of 20 countries that aims to contribute to the removal of the technical obstacles to cross-border data sharing. In order to facilitate the cross-border application of the OOP and provide a basis for the implementation of cross-border public e-services in the future, TOOP is developing a generic federated architecture that supports the organisational, semantic and technical interoperability of national registries across state borders. This architecture will be tested in practice via pilots in the fields of Cross-border e-Services for Business Mobility, Updating Connected Company Data and Online Ship and Crew Certificates.

However, in order for the TOOP pilots and any future cross-border public e-services to be successful, it is not only necessary to address the technical issues but to also identify and mitigate the "soft" organisational, political and legal barriers to the implementation of the OOP. To this end, TOOP also involves an analysis of the current legal, political and organisational landscape and a thorough evaluation of the costs, benefits and impacts of the pilots.

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