

SCOOP4C

STAKEHOLDER COMMUNITY
FOR ONCE-ONLY PRINCIPLE



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Identification and mapping of stakeholders (D2.1)

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Abstract:	This report documents the results of task 2.1, i.e. the identification and mapping of stakeholders that are interacting in OOP contexts. The report includes the findings of relevant literature review, OOP cases analysis and expert opinion, defines the OOP stakeholder roles and provides generic and domain-specific stakeholder maps both in matrix and graphical formats.



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TABLE OF CONTENTS

Executive Summary	1-- 6 -
1. Introduction	1-- 7 -
1.1. <i>Scope</i>	1-- 7 -
1.2. <i>Audience</i>	1-- 7 -
1.3. <i>Structure</i>	1-- 7 -
2. Methodology	2-- 7 -
3. OOP stakeholders in literature	3-- 9 -
3.1. <i>OOP literature</i>	3-- 9 -
3.2. <i>Personal data protection</i>	3-- 13 -
3.3. <i>European Interoperability Framework</i>	3-- 14 -
3.4. <i>Life events</i>	3-- 15 -
4. OOP stakeholders in current implementations	4-- 18 -
4.1. <i>Individuals involved in OOP</i>	4-- 18 -
4.2. <i>Registries of OOP data</i>	4-- 22 -
4.3. <i>Service providers (public authorities & private entities) involved in OOP</i>	4-- 35 -
5. Feedback from stakeholder community	5-- 39 -
5.1. <i>1st Stakeholder workshop in Brussels, March 2017</i>	5-- 39 -
5.2. <i>2nd Stakeholder workshop in Tallinn, May 2017</i>	5-- 40 -
5.3. <i>3rd Stakeholder workshop in Athens, September 2017</i>	5-- 40 -
6. OOP stakeholder definitions	6-- 40 -
7. Generic OOP stakeholder maps	7-- 46 -
8. Domain-specific OOP stakeholder maps	8-- 49 -
8.1. <i>Education</i>	8-- 49 -
8.1.1. <i>Analysis of stakeholders</i>	8-- 49 -
8.1.2. <i>Synthesis of education-specific stakeholder map</i>	8-- 60 -
8.2. <i>Health</i>	8-- 61 -
8.2.1. <i>Analysis of stakeholders</i>	8-- 61 -

8.2.2. Synthesis of health-specific stakeholder map	8-- 75 -
8.3. <i>Taxation</i>	8-- 76 -
8.3.1. Analysis of stakeholders	8-- 76 -
8.3.2. Synthesis of taxation-specific stakeholder map	8-- 84 -
8.4. <i>Social protection</i>	8-- 85 -
8.4.1. Analysis of stakeholders	8-- 85 -
8.4.2. Synthesis of social protection-specific stakeholder map	8-- 90 -
9. Discussion and conclusion	9-- 91 -
References	9-- 91 -
Annex I: Short description of examined OOP cases	9-- 92 -
Annex II: Glossary of key terms	9-- 100 -

LIST OF FIGURES AND TABLES

Figure 1: OOP stakeholders vs. the adapted EIF model (EC, 2010)	3-- 15 -
Figure 2: Use case diagram of OOP stakeholder roles and actions	6-- 45 -
Figure 3: OOP stakeholder model	7-- 47 -
Figure 4: Education domain: main OOP stakeholders and interactions	8-- 60 -
Figure 5: Health domain: main OOP stakeholders and interactions	8-- 75 -
Figure 6: Taxation domain: main OOP stakeholders and interactions	8-- 84 -
Figure 7: Social protection domain: main OOP stakeholders and interactions	8-- 90 -
Table 1: OOP study terms relevant to stakeholders' analysis (Cave et al, 2017, see Annex I, p.54)	3-- 11 -
Table 2: GDPR terms relevant to stakeholders' analysis (EU, 2016, pp.33-34, 65)	3-- 13 -
Table 3: Main life events (De Keyzer et al, 2016, p.61)	3-- 16 -
Table 4: Individuals involved in OOP cases	4-- 18 -
Table 5: Registries of data of OOP cases	4-- 23 -
Table 6: Service providers involved in OOP cases that provide and/or consume data	4-- 35 -
Table 7: Mapping of stakeholder roles and main characteristics	7-- 47 -
Table 8: OOP stakeholders in the Education domain (data for Estonia, Spain, Ireland, the Netherlands and the UK)	8-- 51 -
Table 9: OOP stakeholders in the Health domain (data for Austria and Estonia)	8-- 62 -
Table 10: OOP stakeholders in the Taxation domain (data for Greece, Austria, the UK, France, Estonia) ..	8-- 77 -
Table 11: OOP stakeholders in the Social protection domain (data for Austria, Poland, Estonia and France)	8-- 86 -



ABBREVIATIONS AND ACRONYMS

Abbreviation	Description
CERTH	Centre for Research and Technology Hellas, Greece
CPSV-AP	Core Public Service Vocabulary Application Profile
EC	European Commission
EGA	E-Riigi Akadeemia Sihtasutus E-Governance Academy EGA, Estonia
EIF	European Interoperability Framework
EU	European Union
GDPR	General Data Protection Regulation
INIT	INIT Aktiengesellschaft für Digitale Kommunikation-Init AG, Germany
IT-K	IT-Kommunal GmbH, Austria
MS	Member State
NGO	Non-Governmental Organisation
OOP	Once-Only Principle
UKL	University of Koblenz-Landau, Germany
WP	Work Package



Executive Summary

This deliverable reports the findings and results of work performed under task T2.1, the first task of WP2: Stakeholder map and engagement plan, aiming at investigating OOP from the stakeholder perspective, i.e. investigating the types and roles of stakeholders involved in OOP.

The methodology followed is based first on analysis of relevant literature and current OOP implementations and feedback gathered from the stakeholder community, and second on synthesis of findings to a set of clearly defined stakeholder roles and mapping of stakeholders both in a generic context and in specific domains.

The reviewed literature includes not only OOP literature but also other relevant EU developments, i.e. the recent EU regulation on personal data protection (GDPR), the European Interoperability Framework, and life events. The findings of the literature review showed that many different stakeholders are involved in OOP implementations, covering in essence the whole society. Additionally, they showed that these stakeholders may operate under specific roles in relation to OOP and that these roles are not yet clearly defined.

The analysis of stakeholders involved in existing OOP implementations across Europe includes 30 OOP cases from nine MS. The findings of cases analysis revealed details as to the types of individuals involved in OOP, acting as data subjects and sometimes as data recorders; the registries holding data needed in OOP implementations including data types and registry owners; and the public and private entities involved in OOP acting as data providers and/or data consumers.

This deliverable reports also the validation of the aforementioned findings by the stakeholder community. Feedback from discussions in the stakeholder workshops was mostly targeted on defining the stakeholder roles, their interactions and how best to structure the stakeholder model.

A major result reported in this deliverable is the definition of stakeholder roles as these have been finally formulated in the project. Nine roles have been defined for OOP stakeholders, i.e. data subject, database owner, data controller, data processor, data supervisor, data consumer, data provider, data recorder and data aggregator. The roles have been mapped in a UML use case diagram for clearer depiction of responsibilities.

Furthermore, two generic stakeholder maps for the identified stakeholders are presented. One in the format of a graphical stakeholder model, mapping the different stakeholder roles and types under four layers, i.e. the infrastructure level, the data exchange level, the legal level and the policy level. And one map in the format of a matrix, mapping the different stakeholder roles and types with key characteristics, i.e. key concerns, burden reduction, duties/obligations, and requirements on data quality.

Finally, the deliverable presents a specialisation of the identified stakeholders in the four domains where OOP is being most commonly practiced, i.e. education, health, taxation and social protection. In each domain a stakeholder matrix is provided analysing in detail the specific stakeholders involved in each examined case and their characteristics, and a graphical stakeholder map as a synthesis of findings, depicting the main stakeholders of the domain, the roles they undertake and the interactions among them.

In subsequent work of WP2, the results of this deliverable are used to analyse stakeholder engagement with the aim of developing a strategic stakeholder engagement plan for successful OOP implementations. This deliverable will also provide background information to WP4 for performing gap analysis and reporting of challenges, needs and benefits of OOP implementations.



1. Introduction

1.1. Scope

This deliverable reports the findings and results of work performed under task T2.1, the first task of WP2: Stakeholder map and engagement plan, aiming at investigating OOP from the stakeholder perspective, i.e. investigating the types and roles of stakeholders involved in OOP.

T2.1: Identification and mapping of stakeholders, aims at investigating OOP stakeholders in literature and current implementations but also among the OOP4C community. The deliverable reports not only the findings of this investigation but also further analysis and synthesis of findings towards the identification and definition of OOP stakeholders and roles. The deliverable reports results not only in textual but also in other formats, i.e. lists, matrices as well as graphical formats and maps.

It should be noted that SCOOP4C focuses on the once-only principle in the service of citizens and individuals. For this reason, the deliverable puts emphasis on the citizens' – and not the businesses' – perspective, and thus, e.g. discusses the type of citizens involved and the relevant life events (but not business events).

1.2. Audience

The intended audience for this document is the overall SCOOP4C community, including the consortium partners, the Steering Board members, the stakeholder community, the liaison partners, the antennas and the European Commission, as well as the general public.

1.3. Structure

The structure of the document is as follows:

- Section 2 presents the methodology followed;
- Section 3 reports the findings from literature investigation;
- Section 4 reports the findings from investigating the existing OOP implementations;
- Section 5 reports the feedback gathered from the stakeholder community
- Section 6 presents OOP stakeholder definitions
- Section 7 presents generic stakeholder maps
- Section 8 presents domain-specific stakeholder maps, i.e. maps of stakeholders as these are involved in different cases in the same domain; and
- Section 9 concludes the deliverable.

2. Methodology

This section presents the methodology followed for the work reported in this deliverable.

As regards stakeholder identification, we followed two parallel streams of investigation; theoretical evidence from relevant literature and empirical evidence from current OOP implementations. As SCOOP4C focuses on OOP for citizens and individuals, emphasis was put on citizen-to-government interactions, i.e. where citizens provide data to governments, which governments require in different public service provisioning contexts in different policy domains, but also on government-to-government interactions, i.e. where government agencies exchange data provided by citizens in different public service contexts and domains, and on citizens' life events, while business events or business-to-government interactions were not analysed.



Literature review on OOP produced poor results as research in this field is only now evolving. In specific, there are no OOP indexed scientific papers and only a few papers mentioning OOP can be found online, the most prominent being the EC studies on administrative burden (Gallo et al, 2014) and OOP (Cave et al, 2017), the eGovernment Benchmark 2016 (Tinholt et al, 2016) as well as a few references to OOP in national implementations (Buyle et al, 2016; Ribeiro et al, 2016; Ströbele et al, 2017). At the same time, the recent EU regulation on personal data protection, also referred to as GDPR (EU, 2016), was examined due to the security and privacy considerations related to OOP, as well as the European Interoperability Framework (EC, 2010) in order to investigate relevant implications with OOP stakeholders. Life events were also included in the literature as a way to identify citizen-to-government and government-to-government interaction points and to understand the roles of the individuals involved in OOP as well as the areas of OOP applicability.

The analysis of current OOP initiatives and good practice cases was based on the cases collected until July 2017 by all partners within WP1 as these were documented in SCOOP4C project deliverable, D1.2: State of play report of best practices, and in the knowledge base of the SCOOP4C portal¹. Each of these cases was closely examined as regards the involved stakeholders, their roles (e.g. providing or consuming OOP data), interactions (i.e. who interacts with whom), types (citizens, public authorities, etc.), level (national, local, etc.), the data type concerned, the registries involved, etc. As this deliverable was prepared in parallel to deliverable D1.2 and in parallel to a continuously evolving knowledge base, effort has been made in order to include the most detailed and most actual information possible in the analysis. Thus, work for stakeholder analysis included multiple iterations in case analysis, juxtaposing and merging of information (e.g. for stakeholders being mentioned in multiple cases), enhancement (e.g. level and data type were not initially included in the case template) even contacting experts for additional information.

The theoretical and empirical findings of this analysis allowed us to conclude on the main OOP stakeholders and roles. These results were then presented to and validated by the OOPC community through workshops and online discussions, in specific at:

- SCOOP4C 1st Stakeholder Workshop on Good Practice Cases, Brussels, 14th March 2017
- SCOOP4C 2nd Stakeholder Workshop on Good Practice Cases, Tallinn, 31st May 2017
- SCOOP4C 3rd Stakeholder Workshop on Good Practices, Athens, 19th September 2017
- SCOOP4C Portal Community Forum: <https://www.scoop4c.eu/forum-topic/definition-oop-stakeholder-roles>

As regards to stakeholder mapping, we investigated different methods for presenting and analysing stakeholders, including the following:

- TOGAF stakeholder map matrix^{2 3}
- Project management methods⁴ (Maylor, 2003)
- various methods identified by desktop research, e.g. ^{5,6}
- UML diagrams⁷ and other generic diagrams, e.g. Venn diagrams

¹ The SCOOP4C knowledge base is at <https://www.scoop4c.eu/casetable> however registration is needed in order to access it.

² <http://pubs.opengroup.org/architecture/togaf9-doc/arch/chap24.html>

³ <https://www.slideshare.net/RealIRMSolutions/stakeholder-driven-ea>

⁴ <https://www.slideshare.net/CTESolutions/stakeholder-management-29733079>

⁵ <http://www.tools4dev.org/resources/stakeholder-analysis-matrix-template/>

⁶ <https://www.trainerbubble.com/downloads/stakeholder-management/>

⁷ <http://creately.com/blog/diagrams/uml-diagram-types-examples/>



Building on the aforementioned methods, we constructed an adapted matrix for analysing the identified stakeholders that is suitable for our purposes. The matrix includes the following information per stakeholder role: type, key concern, burden reduction, duties/obligations, and requirements on data quality. We also decided to use UML's use case diagram for graphically depicting the activities performed by each role.

Apart from generic stakeholder analysis and mapping, we also studied stakeholders in the domains where OOP is being most commonly practiced according to the examined cases, i.e. education, health, taxation and social protection. For each of these domains we produced a stakeholder matrix including the specific stakeholders involved according to the cases examined. Additionally, we sketched a graphical stakeholder map depicting the main stakeholders of the domain, the roles they undertake and the interactions among them.

3. OOP stakeholders in literature

The aim of this section is to report and discuss the findings of a literature review regarding the stakeholders involved in OOP.

Before commencing the analysis of the literature review findings, it would be useful to discuss the definition of stakeholders. The term 'stakeholder' is borrowed from organisational theory and strategic management, and is an integral part of any organisation's strategic plan. Examining relevant literature, stakeholders may be defined as follows:

- *"any group or individual who is affected by or can affect the achievement of an organization's objectives"* (Freeman, 2001, p.3)
- *"all parties who will be affected by or will affect [the organization's] strategy"* (Nutt & Backoff, 1992, p.439)
- *"the term refers to persons, groups or organizations that must somehow be taken into account by leaders, managers and front-line staff"* (Bryson, 2004, p.22)

WP2 of SCOOP4C seeks to examine stakeholders in relevance to OOP acceptance and implementation with the ultimate goal to develop a strategic plan for engaging these stakeholders. In this respect, SCOOP4C targets all stakeholders in society, i.e. including not only policy makers and governmental officials who will enforce OOP or public servants who will implement OOP but also the individual citizens who will be the beneficiaries of OOP and the private sector (profit and non-profit) who may and should be involved in OOP implementations. Thus, stakeholders in SCOOP4C WP2 may be defined as follows.

An **OOP stakeholder** is any natural or legal entity who will be affected by or can affect the implementation of OOP.

3.1. OOP literature

A Public Services study titled **Public Services Online: Digital by Default or by Detour?** commissioned by the EC (Tinholt et al, 2013) was one of the first papers introducing OOP. According to this study, services should be designed to be 'customer-centric by default', focusing in particular on simplifying life events by seamlessly combining service building blocks from different government entities. The study discusses the importance of high levels of accessibility and usability, including easy navigation and search, reduction of the number of needed steps and automation of as many of these steps as possible through *"the reuse of user data via the 'once-only' principle"*.

According to the **EU eGovernment Action Plan 2016-2020** (EC, 2016, p.3), the once-only principle requires governments to *"ensure that citizens and businesses supply the same information only once to a public*



administration. Public administration offices take action if permitted to internally re-use this data, in due respect of data protection rules, so that no additional burden falls on citizens and businesses."

Considering this simple definition, it is evident that OOP is about data exchange and that the main stakeholders and roles refer to providing and (re-)using data. A simple model would, thus, view stakeholders as either providing or consuming (using) data. In specific:

- Citizens and businesses act in OOP as "data providers";
- Public administrations act in OOP as "data consumers", obtaining citizens' and businesses' data and sharing it internally among public administrations.
- Public administrations act also as "enablers or facilitators" of OOP since they provide the technological, ethical and legislative base for data sharing.

However, through a closer examination of OOP cases and challenges it is obvious that the aforementioned model is over-simplistic and that it needs to be further elaborated. Consider, for example, the following:

- Is the citizens' and businesses' role only to provide data? Shouldn't they be able to monitor their own data but also the overall data handling according to the principles for enhanced transparency and accountability? Can citizens and businesses additionally act as data consumers?
- Are public administrations the only entities involved in consuming data? Considering especially the new mandate of open and collaborative public services, isn't it reasonable that NGOs, chambers, or even private enterprises may act as data consumers?
- Are public administrations the only entities involved in facilitating OOP? Enabling/facilitating actors are probably drawn from a vast network of governmental, non-governmental, research and corporate entities at national and multi-national levels who can provide the needed technological and legislative base to realize OOP, considering e.g. interoperability and integration issues, semantics and data quality, security and privacy issues, etc.

Some of these points are obvious also in the aforementioned Public Services study (Tinholt et al, 2013), especially in relation to utilising open data and big data. The study discusses the "*potential of incorporating users' own data, crowdsourced data, and relevant data from legitimate third parties*" and the fact that "*in the near future much of this data will be accessible in the cloud and available for use by many stakeholders, not just governments, to develop and co-create their own services*" (p.66).

More recently, an OOP study titled **EU-wide digital Once-Only Principle for citizens and businesses** has been commissioned by the EC (Cave et al, 2017). This study defines various stakeholders to be likely affected by OOP implementations (p.31) as follows:

- Public administrations:
 - European Union
 - Directorates-General with specific sectoral remits;
 - Statistical offices and owners and operators of existing databases (e.g. ECRIS⁸, SIS⁹-II);
 - Providers of data brokerage, search and other OOP-related services;
 - EU Regulators
 - Member State

⁸ European Criminal Records Information System

⁹ Schengen Information System

- Public service providers who collect or request information;
 - Sectoral ministries who may need to choose required and alternative information and implementation strategies for specific aspects of OOP;
 - Owners, controllers and operators of base and other registries and databases who may develop and supply data catalogue entries and ingress, access and egress procedures for re-used data;
 - Providers of data brokerage, search and other OOP-related services;
 - Regulators (including competition, data protection, communications and sectoral regulators) who will mediate legal and regulatory barriers and drivers
- Individuals
 - Benefit claimants;
 - Recipients of public services (including information);
 - Subjects of reporting and information requirements;
 - Subjects of legal and regulatory obligations

The same study defines a useful set of terms for OOP in general and OOP stakeholders and roles in specific (Annex I of the study). The terms most relevant to stakeholders' analysis have been adapted by the OOP study authors from the terms provided by the EU Directives on personal data and the new General Data Protection Regulation (GDPR) (EU, 2016). The terms and definitions are presented in below as exactly as appearing in the study along with corresponding footnotes.

Table 1: OOP study terms relevant to stakeholders' analysis (Cave et al, 2017, see Annex I, p.54)

Term	Meaning
Data subject ¹⁰	The (natural) person whose personal data are collected, held or processed.
Personal data ¹¹	Any information relating to an identified or identifiable natural person ('data subject'); an identifiable natural person is one who can be identified, directly or indirectly, in particular by reference to an identifier such as a name, an identification number, location data, an online identifier or to one or more factors specific to the physical, physiological, genetic, mental, economic, cultural or social identity of that natural person.
Data referent ¹²	The natural person or business to whom the data pertains; in this context also the person, citizen or business requesting the service for which data are used.
Data Ownership	Under EU law, personal data may not be owned. For other types of data, the following definition ¹³ may be useful: "The act of having legal rights and complete control over a single piece or set of data elements. It defines and provides information about the rightful owner of data assets and the acquisition, use and distribution policy implemented by the data owner. Data ownership is primarily a data governance process that details an organisation's legal ownership of enterprise-wide data. A specific organisation or the data owner has the ability to create, edit, modify, share and restrict access to the data. Data ownership also defines the data

¹⁰ Directive 95/46/EC at: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31995L0046:en:HTML>

¹¹ GDPR, Article 4(1)

¹² Author's own definition

¹³ Techopedia: see <https://www.techopedia.com/definition/29059/data-ownership>



	owner's ability to assign, share or surrender all of these privileges to a third party. This concept is generally implemented in medium to large enterprises with huge repositories of centralised or distributed data elements. The data owner claims the possession and copyrights to such data to ensure their control and ability to take legal action if their ownership is illegitimately breached by an internal or external entity."
Database ownership	In the OOP study, the term 'owner' shall be used to indicate the entity that controls, governs and/or is liable for the operation of a database. This is a complex area, partially clarified by the Database Directive ¹⁴ , which distinguishes the rights of database 'makers' and 'users.' For present purposes, however, the intuitive definition suffices.
Data controller	From Art. 4(1) of the GDPR: The natural or legal person, public authority, agency or other body which, alone or jointly with others, determines the purposes and means of the processing of personal data; where the purposes and means of such processing are determined by Union or Member State law, the controller or the specific criteria for its nomination may be provided for by Union or Member State law. The European Data Protection Supervisor defines it ¹⁵ as: The institution or body that (either alone or jointly or in common with other persons) determines the purposes and means of the processing of personal data. In particular, the controller has the duties of ensuring the quality of data and, in the case of the EU institutions and bodies, of notifying the processing operation to the data protection officer (DPO). In addition, the data controller is also responsible for the security measures protecting the data. The controller is also the entity that receives requests from data referents to exercise their rights.
(Data) processing ¹⁶	Any operation or set of operations which is performed upon personal data, whether or not by automatic means, such as collection, recording, organisation, storage, adaptation or alteration, retrieval, consultation, use, disclosure by transmission, dissemination or otherwise making available, alignment or combination, blocking, erasure or destruction. In particular, includes: a) organisation, adaptation or alteration of the information or data, b) retrieval, consultation or use of the information or data, c) disclosure of the information or data by transmission, dissemination or otherwise making available, or d) alignment, combination, blocking, erasure or destruction of the information or data.
Data processor ¹⁷	A natural or legal person, public authority, agency or any other body which processes personal data on behalf of (and subject to instruction by) the controller. The processor only acts on behalf of (and subject to instruction by) the data controller.

¹⁴ Directive 96/9/EC of the European Parliament and of the Council of 11 March 1996 on the legal protection of databases, Official Journal No. L 77 27 March 1996, p. 20-28:

http://www.europa.eu.int/smartapi/cgi/sga_doc?smartapi!celexapi!prod!CELEXnumdoc&lg=en&numdoc=31996L0009&model=guichett

¹⁵ Official definition from European Data Protection Supervisor glossary at:

<https://secure.edps.europa.eu/EDPSWEB/edps/EDPS/DataProtection/Glossary/pid/74>

¹⁶ Article 2 (b) of Regulation (EC) No 45/2001:

https://secure.edps.europa.eu/EDPSWEB/webdav/site/mySite/shared/Documents/EDPS/DataProt/Legislation/Reg_45-2001_EN.pdf. Note that this applies to processing of *personal* data

¹⁷ Article 2 (e) of Regulation (EC) No 45/2001:

https://secure.edps.europa.eu/EDPSWEB/webdav/site/mySite/shared/Documents/EDPS/DataProt/Legislation/Reg_45-2001_EN.pdf

Data supplier	A public administration or authorised data controller or data processor who holds data about data referents on behalf of a public administration and who makes these data available to data requestors.
Data requestor ¹⁸	A public administration data controller that uses data about a data referent to complete an administrative procedure, deliver a service or make a decision. In the OOP study, this refers to the data controller who obtains information under the OOP.

3.2. Personal data protection

As OOP refers to re-using of citizen data, it is important to examine the stakeholders involved also from the data protection perspective. Until 2016, the EU issued different directives on personal data protection and work up to that time was mostly based on these. However, the recent **EU Regulation 2016_679 on personal data** (EU, 2016), also referred to as GDPR (General Data Protection Regulation), is the most up-to-date and official source in the EU for defining the stakeholders in relevance to processing and control of personal data. Thus, in below we present the most relevant terms and definitions from the GDPR, albeit many terms are the same as the ones presented in above.

Table 2: GDPR terms relevant to stakeholders' analysis (EU, 2016, pp.33-34, 65)

Term	Meaning
Personal data	Any information relating to an identified or identifiable natural person ('data subject'); an identifiable natural person is one who can be identified, directly or indirectly, in particular by reference to an identifier such as a name, an identification number, location data, an online identifier or to one or more factors specific to the physical, physiological, genetic, mental, economic, cultural or social identity of that natural person.
Processing	Any operation or set of operations which is performed on personal data or on sets of personal data, whether or not by automated means, such as collection, recording, organisation, structuring, storage, adaptation or alteration, retrieval, consultation, use, disclosure by transmission, dissemination or otherwise making available, alignment or combination, restriction, erasure or destruction.
Controller	The natural or legal person, public authority, agency or other body which, alone or jointly with others, determines the purposes and means of the processing of personal data; where the purposes and means of such processing are determined by Union or Member State law, the controller or the specific criteria for its nomination may be provided for by Union or Member State law.
Processor	A natural or legal person, public authority, agency or other body which processes personal data on behalf of the controller.
Recipient	A natural or legal person, public authority, agency or another body, to which the personal data are disclosed, whether a third party or not. However, public authorities which may receive personal

¹⁸ Note that this differs slightly from the GDPR definition of a 'recipient' in a way that is relevant for OOP. The GDPR (Art. 4(1)) defines a recipient as "a natural or legal person, public authority, agency or another body, to which the personal data are disclosed, whether a third party or not. *However, public authorities which may receive personal data in the framework of a particular inquiry in accordance with Union or Member State law shall not be regarded as recipients*; the processing of those data by those public authorities shall be in compliance with the applicable data protection rules according to the purposes of the processing." GDPR Art. 4(1)



	data in the framework of a particular inquiry in accordance with Union or Member State law shall not be regarded as recipients; the processing of those data by those public authorities shall be in compliance with the applicable data protection rules according to the purposes of the processing.
Third party	A natural or legal person, public authority, agency or body other than the data subject, controller, processor and persons who, under the direct authority of the controller or processor, are authorised to process personal data.
Supervising authority	An independent public authority which is established by a Member State pursuant to Article 51, where it is stated that each Member State shall provide for one or more independent public authorities to be responsible for monitoring the application of this Regulation, in order to protect the fundamental rights and freedoms of natural persons in relation to processing and to facilitate the free flow of personal data within the Union ('supervisory authority').

3.3. European Interoperability Framework

The European Interoperability Framework (EC, 2010) describes a conceptual model for public services that is directly relevant to OOP and, thus, useful for identifying relevant stakeholders. Among others, the model's structure focuses on:

- reuse of data and services, in order to decrease costs and increase service quality and interoperability;
- integrated service delivery in order to decrease complexity for the end-user;
- catalogues describing reusable services and other assets to increase their findability and usage;
- security and privacy.

EIF's conceptual model has been discussed in SCOOP4C project deliverable, D1.2: State of play report of best practices presenting the main actors and systems processing citizen data as well as the enablers and infrastructure services ensuring OOP implementation. Among others, the model includes components relevant to:

- **Storage and re-use of data and other assets¹⁹**, such as:
 - **Base and secondary registries:** Base registries are trusted and authoritative²⁰ sources of information, which can and should be digitally reused by others and in which one organisation is responsible and accountable for the collection, usage, updating and preservation of information. Base registries are reliable sources of basic information on items such as persons, companies, vehicles, buildings, etc. This type of information constitutes the master data²¹ for public administration and European Public Service delivery. Secondary registries can contain own master data and master data from base registries transferred over a Secure Data Exchange layer.
 - **Catalogues.** Catalogues describe reusable services and other assets to increase their findability and usage. This component allows publishers to document and make available resources with the potential to be reused by others. Various types of catalogues exist, e.g. directories of services, libraries of software components, open data portals, registries of registries, metadata catalogues, and catalogues of standards.

¹⁹ Examples of assets are agreements on reference data, in the form of taxonomies, controlled vocabularies, thesauri, code lists and reusable data structures/models.

²⁰ Authoritative here means that a base registry is considered to be the source of information i.e. which represents the correct status, which is up-to-date and which is of highest possible quality.

²¹ Master data may be defined as basic items of information, which can and should be digitally reused by others.

Referring to the terms identified in **Fehler! Verweisquelle konnte nicht gefunden werden.** above, the most important stakeholders of base and secondary registries and catalogues are database owners. Nonetheless, stakeholders relevant to integration and aggregation of data and other assets are also important for these components, especially for utilising legacy systems. For this reason a relevant stakeholder role should be defined.

- **Security and privacy**, such as:
 - **Secure Data Exchange** that aims to ensure that all data exchanges are done in a secure and controlled way.
 - **eID and Trust Services** that refer to infrastructure for identification, signing, encryption, sealing, timestamping, and certificates validation.

Referring to the terms identified in **Fehler! Verweisquelle konnte nicht gefunden werden.** and above, the main stakeholders relevant to data security and privacy are (data) controllers and data supervisors (supervising authorities).

- **User interfaces**, such as:
 - **Front end systems** and **citizen portals**, i.e. portals for supplying integrated services to authorized users including also single sign-on service to citizens. Over the FE data subjects and data consumers interact with different registries.

Referring to the terms identified in **Fehler! Verweisquelle konnte nicht gefunden werden.** and above, the main stakeholders relevant to user interfaces are data consumers. Furthermore, stakeholders relevant to registration of data are also important for these components. For this reason a relevant stakeholder role should be defined.

The aforementioned on the relation of OOP stakeholders and the components of the EIF model are depicted in below.

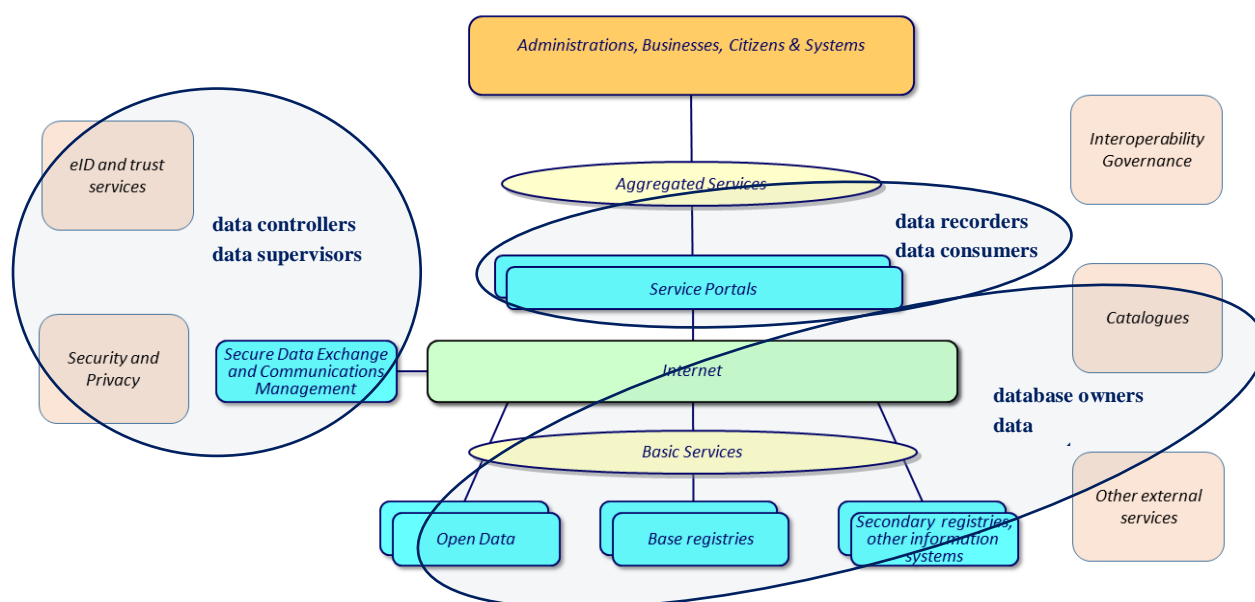


Figure 1: OOP stakeholders vs. the adapted EIF model (EC, 2010)

3.4. Life events



Life events are defined as important events or situations in a citizen's life (European Communities, 2003), such as school, marriage, or buying a property, where public services may be required. From the administration perspective, life events refer to packaged government services, which are usually provided by multiple government agencies, around a situation in a citizen's life (IDABC, 2003, Tinholt et al, 2013). Thus, life events denote the interactions between citizens and governments throughout a citizen's life, and as such provide a good estimation of the activities where administrative burden could be reduced by applying OOP.

Various categorisations of life events have been proposed in literature and are utilised by the different MS web portals, without a unanimous approach across Europe²². An effort to bridge this gap has been recently performed within the 2nd version (De Keyzer et al, 2016) of the Core Public Service Vocabulary Application Profile (CPSV-AP)²³ incorporating contributions of both researchers and practitioners from across Europe. CPSV-AP v2 proposed a list of the main life events as presented in .

Table 3: Main life events (De Keyzer et al, 2016, p.61)

1st level life event	Description
Having a child	This life event groups public services related to becoming a caretaker for a child, for instance in case of giving birth, adopting, receiving a foster child...
Becoming a (social) caretaker	This life event groups public services related to the situation where you need to take care of another person (other than when you get a child), for instance for an elder, a disabled person...
Starting education	This life event groups any public service related to education, for example pre-school education, elementary school, higher education and university...
Looking for a new job	This life event groups public services for when someone looks for a new job or starts a new job.
Losing/quitting a job	This life event groups public services related to the situation when someone leaves or quits a particular jobs on his own, or when someone loses his job, for instance getting fired, collective dismissal, in case of failure of the company...
Looking for a place to live	This life event groups public services related to a person's place of living, for instance, changing residence, buying a house or a piece of land, building, renting a house or apartment...
Changing relationship status	This life event groups public services related to a person's official relationship, for instance marriage, registered partnership, divorce...
Driving a vehicle	This life event groups public services related to driving a vehicle, for instance car, motorcycle... Some example public services are getting your driver license, following driving lessons, registering your car...

²² See for example the portals of Greece: <http://www.ermis.gov.gr/portal/page/portal/ermis/egcl>, Ireland: <http://www.citizensinformation.ie/en/lifeevents/>, Lithuania: <https://www.epaslaugos.lt/portal/en> and Malta: <https://www.gov.mt/en/Life%20Events/Pages/All-Life-Events.aspx>

²³ The CPSV-AP is prepared in the context of Action 1.3 – Accessing Member State information resources at European level – Catalogue of Services of the European Commission's Interoperability for European Public Administrations (ISA) programme. The CPSV-AP has been seen as a first step for creating a model for describing public services related to life and business events, to facilitate the set-up of catalogues of services in the context of the Services Directive. More information at: https://joinup.ec.europa.eu/asset/cpsv-ap/asset_release/core-public-service-vocabulary-application-profile-v100

Travelling abroad	This life events groups public services related to what you need to do when travelling abroad, for instance getting an international passport or driving license, getting a visa, getting vaccination...
Moving to/from the country	This life event groups public services that relate to when someone moves from one country to another.
Going into military service	This life event groups public services related to taking up a mandatory military or civil service.
Facing an emergency / health problem	This life event groups public services related to when someone faces an emergency, for instance in the case of an accident, or a severe health problem, for instance getting disabled.
Facing a crime	This life event groups public services related to a crime, for instance in case you are the committer of that crime, or the victim or witness of a particular crime.
Retirement	This life event groups public services related to when someone retires from his job or becomes a senior.
Death of a relative	This life event groups public services that relate to when a relative passes a way, and cover the public services directly related to the decease of that person (for instance notifying the authorities, arranging the funeral...), as well as related to settling inheritance and donations.

Examining the list of life events of , we may define the main areas where public services are needed and data need to be exchanged. These are relevant to:

- Relationships and family: Marriages, registered partnerships, divorces, births and deaths;
- Education of all levels;
- Military of civil service;
- Employment and retirement, e.g. including job search, starting a new job, quitting a job or getting fired, retiring but also social care;
- Property: renting, buying or building a house to live;
- Transport, i.e. driving licenses;
- Cross-border travelling or moving;
- Law and order;
- Health and emergencies;
- Caretaking for another person.

The aforementioned areas where citizens interact with governments in order to accept public services, are areas that may be optimised by implementing OOP. At the same time, these areas indicate potential types of individuals involved in OOP, as follows:

- Citizens as subjects of a state;
- Partners;
- Parents and guardians;
- Caretakers;
- Patients;
- Students;
- Servants (military/civil);
- Employees;
- Unemployed;
- Retired;

- Beneficiary;
- Property owner/renter;
- Driver;
- Traveler;
- Foreigner;
- Immigrant or emigrant;
- Criminal or accused of a crime.

4. OOP stakeholders in current implementations

WP1 has gathered a substantial amount of OOP cases from across Europe. The collected cases have been analysed in relation to involved stakeholders and their roles. The results of this analysis are reported in the following subsections, while a short description of each examined case is provided in . For a full case description the reader should refer to SCOOP4C project deliverable, D1.2: State of play report of best practices, and in the continuously evolving knowledge base of the SCOOP4C portal.

As mentioned in the methodology section, great effort has been put into considering the most actual information possible in cases' analysis for stakeholder identification. However, it has not been possible to identify every piece of information, hence the N/A (not available) marks in the tables in this chapter.

Another limitation we would like to mention refers to stakeholders' naming. In the following tables stakeholders and registries are mentioned either in English or in the native language or both and either with the full name or with the acronym or both. Effort was put in harmonizing this information as much as possible but it has not been possible to provide fully harmonised data for two reasons. First, case analysis relies heavily to information provided by experts and it is not possible to get all needed information from experts outside the consortium. Second, it is not possible to follow a 100% uniform style. For example, if opting for providing all stakeholder names in the native languages there would be problems reading/spelling them, e.g. names in Greek or Cyrillic alphabet. If opting for providing all stakeholder names in English it would demand translations from the partners as not all countries have official English translations for their authorities and registries, thus naming would be subjective and not easily recognizable even from natives of that country. Thus, the approach followed was to keep the names provided by experts in both native and English languages (if available) and the relevant acronyms.

4.1. Individuals involved in OOP

According to the examined cases, the individuals involved in OOP are as described in . Referring to the roles described in , the identified individuals of are in essence the data subjects.

The findings of show that the individuals currently involved in OOP implementations are operating under the capacity of parents, family members, patients, drivers, applicants, students, (un)employed, citizens and taxpayers. This finding is in line with the potential types of individuals involved in OOP as identified from literature and reported in the previous section. Finally, it is interesting to note that in many cases the data recorders are the data subjects themselves.

Table 4: Individuals involved in OOP cases

Individual involved	Interacts with	Data recorder	Relevant data	Other involved stakeholders	Case
Parent	Civil Registry Office; Hospitals	The authorities	Birth data; Social	Hospitals; Social Insurance; Tax Authority	Birth registration



	hosting Registry Office subsidiaries		Security number		and family allowance, AT
	Department for Work and Pensions (DWP)	Parent (if online) or the authorities	Birth data	HM Passport Office, HM Revenue and Customs, local councils	Tell Us Once Program (TUO), UK
	Online system	Parent (if online) or the authorities	Birth data	Ministry of Working Family and Social Policy, Ministry of administration, employers and banks	Baby bonus (Becikowe), PL
	State Portal or regional bureau of the Social Insurance Board	Parent or regional bureau of the Social Insurance Board	N/A	Social Insurance Board, Health Insurance Fund, Tax & Customs Board	Parental Benefit, EE
Baby	Interaction made by parents	The authorities	Birth data; Social Security number	Parents; Hospitals; Social Insurance; Tax Authority	Birth registration and family allowance, AT
	Interaction made by parents	Parent (if online) or the authorities	Birth data	Department for Work and Pensions (DWP), HM Passport Office, HM Revenue and Customs, local councils	Tell Us Once Program (TUO), UK
	Interaction made by parents	Parent (if online) or the authorities	Birth data	Ministry of Working Family and Social Policy, Ministry of administration, employers and banks	Baby bonus (Becikowe), PL
Family member	Department for Work and Pensions (DWP)	Family member (if online) or the authorities	Mortality data	HM Passport Office, HM Revenue and Customs (HMRC), Driver and Vehicle Licensing Agency (DVLA), local councils, Armed forces pension schemes as data consumers.	Tell Us Once Program (TUO), UK
Patient	Health care providers (GP, hospital, emergency service, dentists, nurses),	Health care providers, pharmacies	Prescription data	Estonian Health Insurance Foundation; public administrations	Digital Prescription, EE ²⁴

²⁴ Patients are also data consumers (seeing their prescriptions) in this case



	pharmacists				
	Health care providers (GP, hospital, specialists)	Health care providers	Health data	Ministry of Social Affairs, Health Insurance Foundation, Health care Board, State Information Board	Doctor-doctor-consultation, EE
	Health Care providers (GP, Hospital, Emergency service, Dentists IS)	Health care providers	Health data (about visit, anamnesis, diagnoses, treatment, examinations and recommendations)	Ministry of Social Affairs, State Agency of Medicine, Health Insurance Foundation, Health care Board, State Information Board, Road Administration Board, Social Security Board, National Health Development Institute, Universities, scientists	Estonian Central Health Information System (EHR), EE ²⁵
	Health care providers (GP, Hospital, Dentists)	Health care providers	Health data (radiological images and films)	Medical Images Foundation, Health care Board, State Information Board	Medical Digital Image Bank, EE
	Hospitals, doctors, care facilities, pharmacies	Hospitals, doctors, care facilities, pharmacies	Health data	ELGA GMBH	Electronic Health Records (ELGA), AT
Driver	Health Information System, doctor	Drivers, Health care providers	Health data	Road administration/Motor registry, Health care Board	Medical Certificate, EE
	Online system	Driver	Data concerning domicile, income and car registration	City administrations, registration office, tax authority	Application for a parking vignette, FR
Student /Applicant (for studying)	Sisseastumise InfoSüsteem (SAIS)	Applicants, universities	Education data	Universities, EHIS, RR, EIS, ÕIS, VVIS, Ministry of Education	Sisseastumise InfoSüsteem (SAIS), EE
	N/A	N/A	Education data	Ministry of Education and Research, different public authorities	Estonian Education Information

²⁵ Patients are also data consumers in this case



					System (EHIS), EE
	Studieliink	Applicants /students, universities	Education data	Universities and other non-private institutions of higher education, DUO (Education Executive Agency/ Ministry of Education)	Studieliink, NL
	Central Applications Office (CAO)	Applicants	Education data	Irish Higher Education Institutions (HEIs)	Central Applications Office (CAO), IE
	Universities and Colleges Admissions System (UCAS)	Applicants /students	Education data	Public and private universities	Universities and Colleges Admissions System (UCAS), UK
	N/A	N/A	Academic data	The Conference of Principals of Spanish Universities (CRUE), RedIRIS (the spanish academic and research network), MINHAP (Ministry of Finance and Public Administration of the national government), Universities/ academics	Interoperability node of the Spanish University System (NISUE), ES
Citizen	Municipalities	Municipalities	Civil data	Public authorities	Citizens' Registry, GR
	Government Portal	N/A	eGovernment services data	Department of Public Expenditure and Reform, Citizens Information Board, Irish Government News Service and 16 other government departments	Government Portal, IE
	E-file system	Citizen	Legal procedural data	Ministry of Justice	E-file system, EE
Employee / Unemployed	-	Employer	Employment data	Tax and Customs Board, Estonian Health Insurance Fund, Estonian Unemployment Insurance Fund, Estonian Labour Inspectorate, Social Insurance Board and Police and Border Guard Board	Register of Employment, EE
	Caisse d'allocations	Unemployment	Information	Revenu de solidarité active	Application



	familiales (Caf) Mutualité sociale agricole (MSA)	ed	n, public authorities already have, e.g. address, family situation, nationality	(RSA)	of work welfare – RSA, FR
Taxpayer	TAXIS system	Tax payer	Revenue and other data relevant to taxation	Various public authorities and private entities (e.g. banks)	TAXIS, GR
	FinanzOnline (FON)	Tax payer		Federal Ministry of Finance and other public authorities	FinanzOnline (FON), AT
	HM Revenues and Customs	Tax payer		Employers, banks, building societies and other public authorities	Making Tax Digital (MTD), UK
	e-Tax	Tax payer		Various public authorities	The electronic tax filing system (e- Tax), EE
	Online system	Tax payer	Family situation, number of dependents , reference tax income, number of shares in household, student grant	Tax authority, Ministry of Education, city administrations	Electronic tax filing system, FR

4.2. Registries of OOP data

According to the examined cases, the registries utilised for maintaining OOP data are as described in . Referring to the roles described in , the owners of the identified registries are in essence the database owners.

The findings of show that there are many registries in various domains that are being utilised in OOP, i.e. registries regarding civil, residential, geographical, ownership, health, educational, (un)employment, business/commercial and agricultural, cultural, transport, legal, financial, social, and public services information. What is interesting to note is that, according to the authors' knowledge, all currently used registries are owned by public entities and mostly refer to the national level of a MS.



Table 5: Registries of data of OOP cases

Registry type	Registry	Level	Data type	Owner	Involved stakeholders	Case
Civil / (non-) citizenship	Central civil register (ZPR)	National	Personal data	Ministry of Interior	Civil Registry Office; Social Insurance; Tax Authority	Birth registration and family allowance, AT
	Central citizenship register (ZSR)	National	Personal data	Ministry of Interior	Civil Registry Office; Social Insurance; Tax Authority	Birth registration and family allowance, AT
	Municipal personal records database (GBA)	Local	Personal data	N/A	DUO (Education Executive Agency/ Ministry of Education)	Studielink, NL
	Citizens' Registry	National	Civil data	Ministry of Interior	Municipalities & other public authorities	Citizens' Registry, GR
	Population Register (RR)	National	Civil data, database of citizens ID number and name	Ministry of the Interior	N/A	Register of Employment, EE; Estonian Education Information System (EHIS), EE; Digital Prescription, EE; E-file system, EE; Parental Benefit, EE; Doctor-doctor-consultation, EE; Estonian Central Health Information System (EHR), EE; Medical Certificate, EE; Medical Digital Image Bank, EE; E-Census, EE; e-PRIA, EE; The electronic tax filing system (e-Tax), EE
	Register of Marriage Contracts	National	Marriage data	N/A	N/A	E-Notary, EE
	The State Human Resources Database (SAP)	National	N/A	Ministry of Finance	N/A	E-Census, EE



	e-Census database	National	Citizen-ship and other personal data	Estonian Board of Statistics	Various public authorities	E-Census, EE
	Migration Register	National	N/A	N/A	N/A	E-Notary, EE
(Non-) Residence	Central residence register (ZMR)	National	Personal data	N/A	Civil Registry Office; Social Insurance; Tax Authority	Birth registration and family allowance, AT
	Register of Residence and Work Permits (ETR)	National	N/A	Ministry of the Interior	N/A	E-Census, EE
	Non-residents register (MRR)	National	N/A	N/A	N/A	The electronic tax filing system (e-Tax), EE
	Population and Housing Census (REL)	National	(legacy data)	Board of Statistics Estonia	N/A	E-Census, EE
	Address Data System (ADS)	National	Address data	Land Board	N/A	Register of Employment, EE; Estonian Education Information System (EHIS), EE; Digital Prescription, EE; E-file system, EE; Doctor-doctor-consultation, EE; Estonian Central Health Information System (EHR), EE; E-Census, EE; e-PRIA, EE
Land & Property	Estonian Register of Buildings (EHR)	National	N/A	Ministry of Economic Affairs and Communications	N/A	E-Census, EE; E-Notary, EE
	Land Cadastre	National	N/A	N/A	N/A	E-Notary, EE
	Land Register (KR)	National	N/A	Ministry of Finance	N/A	E-Census, EE; E-Notary, EE
Health	Prescription Centre	National	Prescription data	Health Insurance	public administration	Digital Prescription, EE; Central Health



				Foundation	s; Health care providers; pharmacists	Information System (EHR), EE
	Health Information System (TEHIK)	National	Health data (doctors' visit, anamnesis, diagnosis, treatment, examinations and recommendations)	Ministry of Social Affairs	Health care providers (GP, hospital, specialists, etc.)	Estonian Central Health Information System (EHR), EE ²⁶ ; Digital Prescription, EE; Parental Benefit, EE; Doctor-doctor-consultation, EE; Medical Digital Image Bank, EE
			Health data (medical certificates)	Ministry of Social Affairs	Health care providers, Road administration /Motor registry	Medical Certificate, EE
	Medical Digital Images Bank	National	Health data (radiological images and films)	Medical Images Foundation	Health care providers, Health care Board	Estonian Central Health Information System (EHR), EE ²⁷ ; Medical Digital Image Bank, EE
	ELGA	National	Health data	ELGA GMBH	Hospitals, doctors, care facilities, pharmacies	Electronic Health Records (ELGA), AT
	Medicines Coding Centre – ATC code and Medicines	National	N/A	State Agency of Medicine	N/A	Digital Prescription, EE; Estonian Central Health Information System (EHR), EE
	Medical devices Registry	N/A	N/A	Health Care Board	N/A	Digital Prescription, EE
	Cancer Register	National	N/A	National Health	N/A	Estonian Central Health Information

²⁶ Patients are also data consumers in this case

²⁷ Patients are also data consumers in this case



				Development Institute		System (EHR), EE
	Infection Diseases register	National	N/A	Health Care Board	N/A	Estonian Central Health Information System (EHR), EE
	Health Insurance Status Register	National	N/A	Health Insurance Foundation	N/A	Digital Prescription, EE; Doctor-doctor-consultation, EE; Estonian Central Health Information System (EHR), EE
	Health Insurance Information System (KIRST)	National	N/A	Health Insurance Fund	N/A	E-Census, EE
	HIS X-Road MISP – Portal for GP	N/A	N/A	N/A	N/A	Digital Prescription, EE; Doctor-doctor-consultation, EE; Estonian Central Health Information System (EHR), EE; Medical Certificate, EE; Medical Digital Image Bank, EE
	HIS X-Road MISP – portal for Emergency Mobile Stations	N/A	N/A	N/A	N/A	Digital Prescription, EE; Estonian Central Health Information System (EHR), EE
	HIS X-Road MISP – Portal for Pharmacies	N/A	N/A	N/A	N/A	Digital Prescription, EE
Education	Sisseastumise InfoSüsteem (SAIS)	International	Education data	Ministry of Education and Research	Applicants, universities, EHIS, RR, EIS, ÕIS, VVIS	Sisseastumise InfoSüsteem (SAIS), EE
	Estonian Education Information System (EHIS)	National	Education data	Ministry of Education and Research	Different public authorities and other registers	Estonian Education Information System (EHIS), EE; Parental Benefit, EE; E-Census, EE
	Examination Information System (EIS)	National	Exam data	N/A	N/A	Estonian Education Information System (EHIS), EE; Sisseastumise



						InfoSüsteem (SAIS), EE
	The study information system in universities and colleges (ÕIS)	National	N/A	N/A	N/A	Sisseastumise InfoSüsteem (SAIS), EE
	System for applicants from abroad (VVIS)	National	N/A	N/A	N/A	Sisseastumise InfoSüsteem (SAIS), EE
	Administration System of School Milk Subsidy	National	N/A	N/A	N/A	e-PRIA, EE
	Central Applications Office (CAO)	National	N/A	Central Applications Office (CAO)	Applicants, Irish Higher Education Institutions (HEIs)	Central Applications Office (CAO), IE
	IB-Groep's General Register for Student Numbers	National	Education and exam data	DUO (Education Executive Agency/ Ministry of Education)	Applicants/students and universities through Studielink	Studielink, NL
	Universities and Colleges Admissions System (UCAS)	National	Education data	UCAS (charity, non-governmental organisation)	Applicants/students and universities	Universities and Colleges Admissions System (UCAS), UK
	NISUE	National	Academic data	Conference of Principals of Spanish Universities (CRUE), RedIRIS (the Spanish academic and research network), MINHAP (Ministry of Finance)	Universities/academics	Interoperability node of the Spanish University System (NISUE), ES



				and Public Administration)		
	Register of Professions	National	Occupational qualification standards, occupational qualification certificates, catalogue of occupational qualifications	Ministry of Education and Research & Estonian Qualifications Authority	Estonian Unemployment Insurance Fund, Statistics Estonia, Estonian Environment Information Centre, Estonian Rescue Board and other public authorities	Estonian Education Information System (EHIS), EE
Employment/Unemployment	Register of Employment (TÖR)	National	Employment data	Tax and Customs Board / Ministry of Finance	Employers, Estonian Health Insurance Fund, Estonian Unemployment Insurance Fund, Estonian Labour Inspectorate, Social Insurance Board and Police and Border Guard Board	Register of Employment, EE; E-Census, EE; The electronic tax filing system (e-Tax), EE
	Estonian Unemployment Information System (EMPIS)	National	N/A	Estonian Unemployment Insurance Fund	N/A	E-Census, EE
Business	Business Register (ARIREG)	National	N/A	Ministry of Finance	N/A	Register of Employment, EE; National; Digital



						Prescription, EE; Doctor-doctor-consultation, EE; Estonian Central Health Information System (EHR), EE; Medical Certificate, EE; Medical Digital Image Bank, EE; E-Census, EE; e-PRIA, EE; The electronic tax filing system (e-Tax), EE; E-Notary, EE
	Small Ship Register	National	N/A	N/A	N/A	E-Notary, EE
	Register of Handlers of medicines – Licences of Pharmacies and pharmacists	National	N/A	State Agency of Medicine	N/A	Digital Prescription, EE; Estonian Central Health Information System (EHR), EE
	Health care providers Register	N/A	N/A	Health care Board	N/A	Digital Prescription, EE; Doctor-doctor-consultation, EE; Estonian Central Health Information System (EHR), EE; Medical Certificate, EE; Medical Digital Image Bank, EE
	Health professionals Register	N/A	N/A	Health care Board	N/A	Digital Prescription, EE; Doctor-doctor-consultation, EE; Estonian Central Health Information System (EHR), EE; Medical Certificate, EE; Medical Digital Image Bank, EE
	The reporting system of electronic gaming (EHMA)	National	N/A	N/A	N/A	The electronic tax filing system (e-Tax), EE
	Monuments register	National	N/A	N/A	N/A	E-Notary, EE



	The list of persons of gaming restrictions (HAMPI)	National	N/A	N/A	N/A	The electronic tax filing system (e-Tax), EE
	Registry of Recreational Craft	National	N/A	N/A	N/A	E-Notary, EE
Transport	Motor registry	National	N/A	Road Administration	N/A	Medical Certificate, EE
	Traffic Register (liiklusregister).	National	N/A	Road Administration	N/A	E-Census, EE; E-Notary, EE
Law	Punishment Records Register	National	N/A	N/A	N/A	Estonian Education Information System (EHIS), EE
	Register of prisoners, post-sentence prisoners, detainees and arrested peoples (KIR)	National	N/A	Ministry of the Interior	N/A	E-Census, EE
	System of detention orders transmission (e-arrest)	National	N/A	N/A	N/A	The electronic tax filing system (e-Tax), EE
	Consolidated List of Terrorist	National	N/A	N/A	N/A	E-Notary, EE
	E-Notary	National	N/A	Chamber of Notaries / Centre of Registers and Information Systems	N/A	E-Notary, EE
	E-file system (E-Toimik)	National	Legal procedural data	Ministry of Justice, Ministry of Finance	N/A	E-file system, EE; E-Census, EE
	Estonian Central Register of Securities	National	N/A	N/A	N/A	E-Notary, EE
	Register of	National	N/A	N/A	N/A	E-Notary, EE



	Official Announcements					
	Register of Constructions	National	N/A	N/A	N/A	E-Notary, EE
	Succession Register	National	N/A	N/A	N/A	E-Notary, EE
Taxation & finance	TAXIS	National	Personal data, revenue data and other data relevant to taxation	Ministry of Finance	Various public authorities and private entities (e.g. banks)	TAXIS, GR
	FinanzOnline (FON)	Federal	Personal data, revenue data and other data relevant to taxation	Federal Ministry of Finance	Various public authorities	FinanzOnline (FON), AT
	Register of taxable persons (EMTA)	National	N/A	Ministry of Finance	N/A	Estonian Education Information System (EHIS), EE; E-file system, EE; E-Census, EE; The electronic tax filing system (e-Tax), EE
	IS of Tax & Customs Board (EMTA)	National	N/A	Tax & Customs Board	N/A	Parental Benefit, EE
	e-Tax	National	N/A	N/A	N/A	The electronic tax filing system (e-Tax), EE
	The VAT return (KMD) subsystem	National	N/A	N/A	N/A	The electronic tax filing system (e-Tax), EE
	Land Tax Information system (MAKIS)	National	N/A	N/A	N/A	The electronic tax filing system (e-Tax), EE
	Foreign Account Tax Compliance Act application	National	N/A	N/A	N/A	The electronic tax filing system (e-



	(FATCA)					Tax), EE
	N/A	National	Personal data, revenue data and other data relevant to taxation	HM Revenues and Customs	Taxpayers, employers, banks, building societies and other public authorities	Making Tax Digital (MTD), UK
	Excise goods Customs Surveillance Information System (JVIS)	National	N/A	N/A	N/A	The electronic tax filing system (e-Tax), EE
	Information system MOSS	National	N/A	N/A	N/A	The electronic tax filing system (e-Tax), EE
	The register of declarations of interests (HDR)	National	N/A	N/A	N/A	The electronic tax filing system (e-Tax), EE
	The Control system of import (ICS)	National	N/A	N/A	N/A	The electronic tax filing system (e-Tax), EE
	The system of permits (LUBA)	National	N/A	N/A	N/A	The electronic tax filing system (e-Tax), EE
	Information system of fiscal stamps (MAIS)	National	N/A	N/A	N/A	The electronic tax filing system (e-Tax), EE
Government services	Government Portal	National	eGovern ment services data	Departmen t of Public Expenditur e and Reform	Citizens and businesses, Citizens Information Board, Irish Government News Service and 16 other government departments	Government Portal, IE
	System of electronic standard forms (AITA)	National	N/A	N/A	N/A	The electronic tax filing system (e-Tax), EE
	State Register of State and Local	National	N/A	Ministry of	N/A	E-Census, EE; The electronic tax filing



	Government Institutions (RKOARR)			Finance		system (e-Tax), EE; E-Notary, EE
	Register for Agencies of State and Municipalities	National	N/A	N/A	-	Register of Employment, EE
Social	Social Services and Benefits Registry (STAR)	National	Baby data	Social Insurance Board / Ministry of Social Affairs	Health Insurance Fund, Tax & Customs Board and other authorities	Parental Benefit, EE; E-Census, EE
	Register of Mandatory Funded Pension (KPR)	National	N/A	Ministry of Finance	N/A	E-Census, EE; E-Notary, EE
	Social Security Information System (SKAIS)	National	N/A	Ministry of Social Affairs	N/A	E-Census, EE
	N/A	National	Personal data	Ministry of Working Family and Social Policy and Ministry of administration	Employers and banks	Baby bonus (Becikowe), PL
	DWP database	National	Personal data	Department for Work and Pensions (DWP)	HM Passport Office, HM Revenue and Customs (HMRC), Driver and Vehicle Licensing Agency (DVLA), local councils, Armed forces pension schemes	Tell Us Once Program (TUO), UK
Defence	National Defence Obligation Register (KVKR)	National	N/A	Ministry of Defence	N/A	E-Census, EE



Agriculture	Administration System of National Subsidies	National	N/A	N/A	N/A	e-PRIA, EE
	e-PRIA	National	N/A	Ministry of Rural Affairs/ Agricultural Registers and Information Board (ARIB)	N/A	e-PRIA, EE
	Client register	National	N/A	Ministry of Rural Affairs/ Agricultural Registers and Information Board (ARIB)	N/A	e-PRIA, EE
	Rural development aid system	National	N/A	N/A	N/A	e-PRIA, EE
	Rural development support administration system	National	N/A	N/A	N/A	e-PRIA, EE
	Register of agricultural support and agricultural parcels	National	N/A	N/A	N/A	e-PRIA, EE
	Estonian Agricultural Geographical Information System (EAGIS)	National	N/A	N/A	N/A	e-PRIA



4.3. Service providers (public authorities & private entities) involved in OOP

According to the examined cases, the public authorities and private entities involved in OOP cases are as described in . These entities are involved in public service provision and are either providing or consuming OOP data. Thus, the public authorities and private entities of refer to the data providers and data consumers.

The findings of show that both public authorities and private entities act as data providers and data consumers in current OOP implementations. The private entities identified are mainly health care providers (e.g. hospitals and doctors), pharmacists, Universities and academics, private employers, banks, and building societies.

Table 6: Service providers involved in OOP cases that provide and/or consume data

Area	Stakeholder	Type	Level	Role	Case
Citizenship	Civil Registry Office	Public	Local	Provides and consumes data	Birth registration and family allowance, AT
	HM Passport Office, local councils	Public	National	Consumes data	Tell Us Once Program (TUO), UK
Government services	Municipalities	Public	Local	Provides and consumes data	Citizens' Registry, GR; Application for a parking vignette, FR
	Ministry of the Interior	Public	National	Provides data	E-Census, EE
	Federal Ministry of the Interior	Public	Federal	Provides and consumes data	Birth registration and family allowance, AT
	Federal Ministry of Families and Youth Affairs	Public	Federal	Consumes data	Birth registration and family allowance, AT
	MINHAP (Ministry of Finance and Public Administration)	Public	National	Provides and consumes data	Interoperability node of the Spanish University System (NISUE), ES
	Citizens Information Board	Public	National	Provides data	Government Portal, IE
	Irish Government News Service	Public	National	Provides data	Government Portal, IE
	Board of Statistics Estonia	Public	National	Provides data	E-Census, EE
	State Information Board	Public	National	Provides data	Digital Prescription, EE; Doctor-doctor-consultation, EE; Estonian Central Health Information System (EHR), EE
Social	Ministry of Working Family and Social Policy	Public	National	Consumes data	Baby bonus (Becikowe), PL
	Social Insurance Agency	Public	National	Provides and consumes data	Birth registration and family allowance, AT



	Social Insurance Board	Public	National	Provides and consumes data	Register of Employment, EE; Parental Benefit, EE
	Social Security Board	Public	National	Consumes data	Estonian Central Health Information System (EHR), EE
	Department for Work and Pensions (DWP), Armed forces pension schemes	Public	National	Consumes data	Tell Us Once Program (TUO), UK
Taxation & Finance	Federal Ministry of Finance (tax authority)	Public	Federal	Provides and consumes data	Birth registration and family allowance, AT; FinanzOnline (FON), AT
	HM Revenue and Customs (HMRC)	Public	National	Consumes data	Tell Us Once Program (TUO), UK; Making Tax Digital (MTD), UK
	Ministry of Finance	Public	National	Provides and consumes data	TAXIS, GR
				Provides data	E-Census, EE
	Ministry of Economic Affairs and Communications	Public	National	Provides data	E-Census, EE
	Banks	Public / private	National	Provides data	Making Tax Digital (MTD), UK; TAXIS, GR; Baby bonus (Becikowe), PL
	Tax & Customs Board	Public	National	Provides and consumes data	Parental Benefit, EE
Health	Hospital	Any	N/A	Provides data	Birth registration and family allowance, AT
				Provides and consumes data	Electronic Health Records (ELGA), AT
	Health Insurance Foundation	Public	National	Provides and consumes data	Digital Prescription, EE; Parental Benefit, EE; Estonian Central Health Information System (EHR), EE
				Provides data	Doctor-doctor-consultation, EE; E-Census, EE
				Consumes data	Register of Employment, EE
	Health care providers (GP, hospitals,	Public/private	N/A	Provides and consumes data	Digital Prescription, EE; Electronic Health Records



	emergency services, dentists, nurses, specialists)				(ELGA), AT; Doctor-doctor-consultation, EE; Estonian Central Health Information System (EHR), EE; Medical Certificate, EE; Medical Digital Image Bank, EE
	Doctors	Public/private	N/A	Provides and consumes data	Electronic Health Records (ELGA), AT
	Pharmacists	Private	N/A	Provides and consumes data	Digital Prescription, EE; Electronic Health Records (ELGA), AT
	Ministry of Social Affairs	Public	National	Provides and consumes data	Digital Prescription, EE
				Provides data	E-Census, EE
	State Agency of Medicine	Public	National	Provides data	Digital Prescription, EE; Estonian Central Health Information System (EHR), EE
	National Health Development Institute	Public	National	Consumes data	Estonian Central Health Information System (EHR), EE
	Health Care Board	Public	National	Provides and consumes data	Estonian Central Health Information System (EHR), EE
				Provides data	Digital Prescription, EE; Doctor-doctor-consultation, EE; Medical Certificate, EE; Medical Digital Image Bank, EE
Transport	Road Administration Board	Public	National	Consumes data	Medical Certificate, EE; Estonian Central Health Information System (EHR), EE
				Provides data	E-Census, EE
	Driver and Vehicle Licensing Agency (DVLA)	Public	National	Consumes data	Tell Us Once Program (TUO), UK
Education	Universities	Public/private	Any	Provides and consumes data	Sisseastumise InfoSüsteem (SAIS), EE; Studielink, NL; Universities and Colleges Admissions System (UCAS), UK; Interoperability node of the Spanish University System



					(NISUE), ES
	Universities, Scientists	N/A	N/A	Consumes data	Estonian Central Health Information System (EHR), EE
	Academics	Public/private	Any	Provides and consumes data	Interoperability node of the Spanish University System (NISUE), ES
	Irish Higher Education Institutions (HEIs)	Any	N/A	Provides and consumes data	Central Applications Office (CAO), IE
	Ministry of Education	Public	National	Provides and consumes data	Studielink, NL
	Ministry of Education and Research	Public	National	Provides and consumes data	Estonian Education Information System (EHIS), EE
				Consumes data	Sisseastumise InfoSüsteem (SAIS), EE
	Conference of Principals of Spanish Universities (CRUE)	Public	National	Provides and consumes data	Interoperability node of the Spanish University System (NISUE), ES
	RedIRIS (the spanish academic and research network)	Public	National	Provides and consumes data	Interoperability node of the Spanish University System (NISUE), ES
(Un)Employment	Estonian Unemployment Insurance Fund	Public	National	Provides and consumes data	Register of Employment, EE
				Provides data	E-Census, EE
	Estonian Labour Inspectorate	Public	National	Consumes data	Register of Employment, EE
	Employers	Public / private	National	Provides data	Making Tax Digital (MTD), UK; TAXIS, GR; Baby bonus (Becikowe), PL
	Caisse d'allocations familiales (Caf) Mutualité sociale agricole (MSA)	Public	National	Consumes data	Application of work welfare – RSA, FR
Reinforcement & Defence	Police	Public	National	Consumes data	Register of Employment, EE
	Border Guard Board	Public	National	Consumes	Register of Employment,



				data	EE
	Ministry of Defence	Public	National	Provides data	E-Census, EE
Agriculture	Agricultural Registers and Information Board	Public	National	Provides data	e-PRIA, EE
	Veterinary and Food administration	Public	National	Provides data	e-PRIA, EE
Land & Construction	Building societies	Private	National	Provides data	Making Tax Digital (MTD), UK
	Land Board	Public	National	Provides data	Register of Employment, EE; Estonian Education Information System (EHIS), EE; Digital Prescription, EE; E-file system, EE; Doctor-doctor-consultation, EE; Estonian Central Health Information System (EHR), EE; E-Census, EE
Law	European Network of Registers of Wills	N/A	European	Provides and consumes data	E-Notary, EE

5. Feedback from stakeholder community

SCOOP4C aims at gathering information for analysis not only from relevant literature and current practice but also from the expertise and experience of the stakeholder community members. For this reason, progress and findings of T2.1 have been presented and discussed in the three first stakeholder workshops of the project and in the project's portal, i.e. at:

- SCOOP4C 1st Stakeholder Workshop on Good Practice Cases, Brussels, 14th March 2017
- SCOOP4C 2nd Stakeholder Workshop on Good Practice Cases, Tallinn, 31st May 2017
- SCOOP4C 3rd Stakeholder Workshop on Good Practices, Athens, 19th September 2017
- SCOOP4C Portal Community Forum: <https://www.scoop4c.eu/forum-topic/definition-oop-stakeholder-roles>

This section reports the feedback gathered from the experts of the stakeholder community in the three stakeholder workshops. Feedback from the community forum has not been included in this chapter as nothing relevant was received when until the submission of this deliverable

5.1. 1st Stakeholder workshop in Brussels, March 2017

By the first stakeholder workshop, WP2 was still at its beginning and therefore did not have a dedicated session or presentation in the agenda. Nonetheless, a first draft model of OOP stakeholder roles and interactions was presented to the audience. The main feedback gathered referred to highlighting the importance of existing available datasets and to introducing a role for data aggregation. This feedback was well accepted and, hence, the data aggregator role was defined.



5.2. 2nd Stakeholder workshop in Tallinn, May 2017

At the second stakeholder workshop, WP2 organised a dedicated session on verification of stakeholder maps and stakeholder engagement. In this session, an update of the previous stakeholder model was presented and the stakeholder types, roles and interactions were discussed in detail, based on the real-case examples of the Austrian birth registration and the Estonian health cases. Additionally, a new stakeholder model was presented, depicting the stakeholders within four different levels of OOP, i.e. the policy, legal/ethical, process, and infrastructure levels.

The audience participated in a vivid discussion on the stakeholder roles and the interactions among them, proposing relevant changes in the presented models. The potential role of data viewer (i.e. for citizens wanting to check their data) was discussed but was finally decided that this role is included within the data subject role (named data referent at that time). The ethical aspect of the legal / ethical level was also discussed. Since the ethical aspect in this context refers more to good governance in terms of accountability and transparency, it was decided to be included as a monitoring and accountability part within the process level. Moreover, the need for closer collaboration and alignment of results between SCOOP4C and TOOP emerged in this session, i.e. aligning terminology for stakeholder roles. For example, the projects should use one common term for data provider (not e.g. data supplier) or for the data consumer (not e.g. data requestor or data user).

The discussion continued during the Steering Board meeting conducted the following day, where the workshop suggestions were processed and specific actions were decided.

5.3. 3rd Stakeholder workshop in Athens, September 2017

At the third stakeholder workshop, WP2 organised a dedicated session on OOP stakeholders and how to successfully engage them in OOP implementations. In this session, the final stakeholder model and roles were presented and well-received by the audience. The discussion in this workshop focused more on the problems faced in OOP implementations and how these impact stakeholders' engagement. Thus, the feedback was mostly relevant to deliverable D2.2 and will be reported there in more detail. Very briefly, the main topics of the discussion referred to the need for top-down will and commitment to OOP, to the importance of relevant legal and institutional frameworks, and to human resources aspects.

6. OOP stakeholder definitions

The aim of this section is to clearly define a list of stakeholder roles in the context of the once-only principle.²⁸ The definitions and discussion presented in this section are based on the findings of the analyses reported in the three previous sections and serve as the basis upon which the stakeholder maps and the stakeholder engagement plan (deliverable D2.2) will be constructed.

The GDPR²⁹ refers to the data subject as “an identifiable natural person who can be identified, directly or indirectly, in particular by reference to an identifier such as a name, an identification number, location data, an online identifier

²⁸ Literature studied are e.g. the indications provided in footnote **Fehler! Textmarke nicht definiert., Fehler! Textmarke nicht definiert.**, 13 or the European Interoperability Framework in version 2 (Annex II of COM(2017)134, see http://eur-lex.europa.eu/resource.html?uri=cellar:2c2f2554-0faf-11e7-8a35-01aa75ed71a1.0017.02/DOC_3&format=PDF)

²⁹ REGULATION (EU) 2016/679 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation), available at:



or to one or more factors specific to the physical, physiological, genetic, mental, economic, cultural or social identity of that natural person.”³⁰ The drawback in this definition is that it refers only to natural persons and does not include legal persons as well. This was noted by the OOP study³¹, where the terms data referent and data subject are used both for individuals and businesses to whom the data refers. In specific, in the OOP study data referent is defined as “The natural person or business to whom the data pertains; in the OOP context also the person, citizen or business requesting the service for which data are used”³² and data subject is defined as “The (natural) person whose personal data are collected, held or processed”³³. In SCOOP4C, we believe that only one of these terms needs to be adopted. We opt for the term data subject in order to comply with the GDPR. However, we do acknowledge that its definition should be more universal (including natural and legal persons). Furthermore, recognising data subjects’ expectation to be able to monitor own data but also the overall data handling according to the principles for enhanced transparency and accountability, we expand the definition accordingly as follows.

Data subject is defined as an identifiable natural or legal person to whom the data, which are collected, held or processed in OOP contexts, pertains. Data subjects are to be given access to view data (and usage of such data) that are relevant to themselves and/or other information relevant to OOP data usage.

The **Personal data** definition is adopted from the GDPR, i.e. “Any information relating to an identified or identifiable natural person (‘data subject’); an identifiable natural person is one who can be identified, directly or indirectly, in particular by reference to an identifier such as a name, an identification number, location data, an online identifier or to one or more factors specific to the physical, physiological, genetic, mental, economic, cultural or social identity of that natural person.”³⁴

As the ownership of personal data is not clearly and uniformly defined in the different Member States³⁵, we adopt the OOP study’s approach that **personal data may not be owned**. Thus, **we refrain from using any term relevant to data ownership or data owner for personal data** in SCOOP4C. However, we understand that the data ownership concept is useful when discussing data governance within enterprises. As the OOP study quotes: “Data ownership is primarily a data governance process that details an organisation’s legal ownership of enterprise-wide data. A specific organisation or the data owner has the ability to create, edit, modify, share and restrict access to the data. Data ownership also defines the data owner’s ability to assign, share or surrender all of these privileges to a third party. This concept is generally implemented in medium to large enterprises with

http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2016.119.01.0001.01.ENG&toc=OJ:L:2016:119:TOC

³⁰ Ibid. p. 33

³¹ Cave, J., Botterman, M., Cavallini, S., and Volpe, M. (2017). EU-wide digital Once-Only Principle for citizens and businesses, doi:10.2759/393169, available at: <https://ec.europa.eu/digital-single-market/en/news/eu-wide-digital-once-only-principle-citizens-and-businesses-policy-options-and-their-impacts>

³² Ibid. p. 58

³³ Ibid. p. 57, based on the explanations regarding data subject provided in the GDPR (see footnote **Fehler! Textmarke nicht definiert.**)

³⁴ Ibid. p. 33

³⁵ For example, considering the personal data that are usually used in transactions with public authorities, such as name, birth date, identification number, tax number, social security number, home address, or telephone number, it is difficult to determine who the owner of each piece of data is (e.g. the citizen? the state? and if the state which exact public body?) as this is also pursuant to the different MS legislations and way of conduct.

huge repositories of centralised or distributed data elements. The data owner claims the possession and copyrights to such data to ensure their control and ability to take legal action if their ownership is illegitimately breached by an internal or external entity.”³⁶ Thus, we do accept the concepts database ownership and database owners and define the latter as follows.

Database owner is defined according to the 2017 OOP study as “*the entity that controls, governs and/or is liable for the operation of a database.*”³⁷ To clarify that not only public but also private entities may be liable for a database holding data that should be shared and reused among government agencies in the OOP context, we slightly adapt the aforementioned definition and define database owner as follows.

Database owner is defined as any entity that controls, governs and/or is liable for the operation of a database that maintains data that can be reused and shared in OOP contexts.

Processing is to be understood according to GDPR definition, i.e. “*Any operation or set of operations which is performed on personal data or on sets of personal data, whether or not by automated means, such as collection, recording, organisation, structuring, storage, adaptation or alteration, retrieval, consultation, use, disclosure by transmission, dissemination or otherwise making available, alignment or combination, restriction, erasure or destruction.*”³⁸

Controller is defined in the GDPR as “*The natural or legal person, public authority, agency or other body which, alone or jointly with others, determines the purposes and means of the processing of personal data; where the purposes and means of such processing are determined by Union or Member State law, the controller or the specific criteria for its nomination may be provided for by Union or Member State law.*”³⁹ Moreover, as the OOP study explains quoting the European Data Protection Supervisor⁴⁰, “*In particular, the controller has the duties of ensuring the quality of data and, in the case of the EU institutions and bodies, of notifying the processing operation to the data protection officer. In addition, the data controller is also responsible for the security measures protecting the data. The controller is also the entity that receives requests from data referents to exercise their rights.*” In accordance with the aforementioned definitions, we define the data controller as follows.

Data controller is defined as any natural or legal entity that is liable for determining the purposes and means of the processing of personal data, ensuring the quality and security of OOP data, and notifying the processing operation to the data supervisor.

Processor is defined in the GDPR as “*A natural or legal person, public authority, agency or other body which processes personal data on behalf of the controller.*”⁴¹ The OOP study adds also that the data processor “only

³⁶ Ibid. p. 56

³⁷ Ibid. p. 57

³⁸ Ibid. p.33

³⁹ Ibid. p.33

⁴⁰ Official definition from European Data Protection Supervisor glossary at: <https://secure.edps.europa.eu/EDPSWEB/edps/EDPS/Dataprotection/Glossary/pid/74>

⁴¹ Ibid. p.33



*acts on behalf of (and subject to instruction by) the data controller*⁴². In accordance with the aforementioned definitions, we define the data processor as follows.

Data processor is defined as any natural or legal entity that processes personal data on behalf of (and subject to instruction by) the data controller.

The GDPR defines the supervisory authority as “An independent public authority which is established by a Member State pursuant to Article 51”⁴³, where it is stated that “each Member State shall provide for one or more independent public authorities to be responsible for monitoring the application of this Regulation, in order to protect the fundamental rights and freedoms of natural persons in relation to processing and to facilitate the free flow of personal data within the Union (‘supervisory authority’).”⁴⁴ In accordance with the aforementioned definition, we define the data supervisor as follows.

Data supervisor is defined as an independent public authority that is responsible for monitoring and enforcing the application of MS and EU regulations on data protection.

As regards data exchange, the OOP study defines the data supplier as “A public administration or authorised data controller or data processor who holds data about data referents on behalf of a public administration and who makes these data available to data requestors”⁴⁵ and the data requestor as “A public administration data controller that uses data about a data referent to complete an administrative procedure, deliver a service or make a decision. In this document, this refers to the data controller who obtains information under the OOP.”⁴⁶ The GDPR provides no definition for data supply, but it does define the recipient in a completely different way than the requestor, i.e. “A natural or legal person, public authority, agency or another body, to which the personal data are disclosed, whether a third party or not. However, public authorities which may receive personal data in the framework of a particular inquiry in accordance with Union or Member State law shall not be regarded as recipients; the processing of those data by those public authorities shall be in compliance with the applicable data protection rules according to the purposes of the processing.”⁴⁷ The definition provided by the OOP study is obviously more relevant to our purpose. However, considering the new mandate of open and collaborative public services we find it useful to include not only public administrations but also any other natural or legal entity as data requestor. For this reason, we also adopt a more generic name: data consumer. Thus, the data consumer is defined as follows.

Data consumer is defined as any natural or legal entity that uses data about a data subject to complete an administrative procedure, deliver a service or make a decision.

Similarly, the data provider is defined as follows.

Data provider is defined as any natural or legal entity who holds data about data subjects and makes these data available to data consumers.

It should be noted here that, according to this definition, an individual who provides personal data for completing a public service is not considered a data provider (just a data subject).

⁴² Ibid. p.57

⁴³ Ibid. p.34

⁴⁴ Ibid. p.65

⁴⁵ Ibid. p.58

⁴⁶ Ibid. p.57

⁴⁷ Ibid. p.33



Recognising that first (and only) registration of OOP data is crucial for correct OOP implementation, we define the data recorder as follows.

Data recorder is defined as any entity that registers/ updates the data of the data subject.

In the case that a data subject registers own data (e.g. through an online system), that data subject undertakes also the role of the data recorder.

Recognising that interoperability and integration are crucial enablers of OOP especially as regards cross-border cases, we define the data aggregator as follows.

Data aggregator is defined as any entity that is liable for integrating/aggregating OOP data from/to different databases, formats, etc.

presents a graphical depiction of defined stakeholder roles in the form of a UML use case diagram. This type of diagram is used to show the activities performed by each actor in an Information System, thus it is useful for depicting at a glance the rights and responsibilities of each role. In specific, the data recorder is the entity registering data (either new data or updates), the database owner is the entity in charge of the database storing the data, the data aggregator is the entity for integrating and aggregating data from different sources, the data provider is the entity supplying the data it has to other entities and data consumer is the entity requesting and consuming the data of another entity. All aforementioned roles are processing data and are thus child roles to the data processor role. There are three more entities: the data controller as the entity ensuring data privacy and security and legal compliance of data processing, the data supervisor as the entity enforcing and monitoring data privacy regulation, and data subject to whom the data refer and who may access information on how data are being used and by whom.

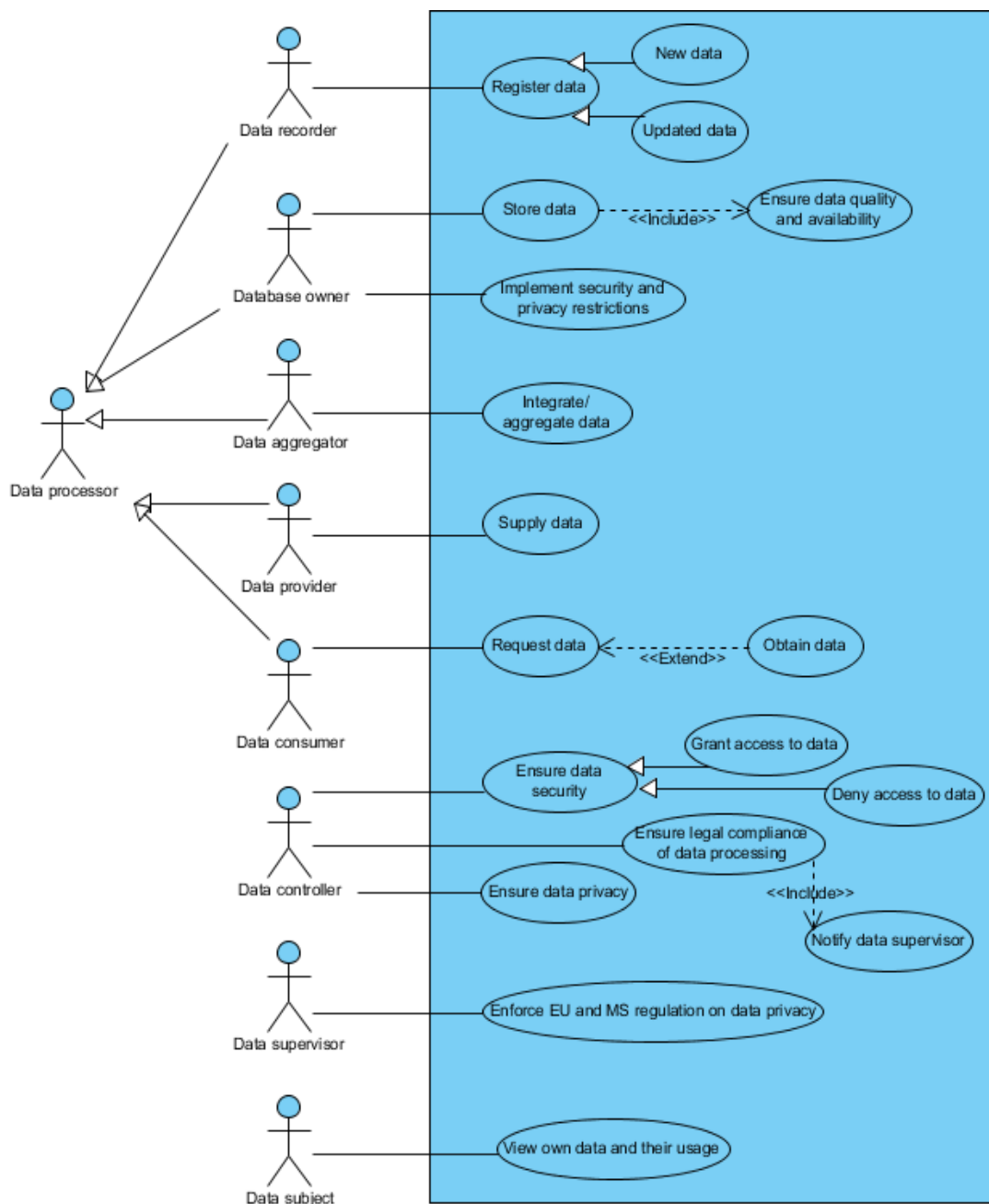


Figure 2. Use case diagram of OOP stakeholder roles and actions



7. Generic OOP stakeholder maps

The aim of this section is to map the OOP stakeholders according to the findings reported in the previous sections. presents a comprehensive model of OOP stakeholders depicting the different stakeholder types and stakeholder roles according to four levels of involvement (policy; legal; data exchange; infrastructure). Furthermore, the OOP stakeholder roles and their main characteristics are mapped in a matrix format in .

Referring to , the identified stakeholders have been mapped to four levels as follows.

The bottom level is the infrastructure level referring to data storage and maintenance, technically ensuring data privacy and security, data interoperability and data integration and aggregation among different databases, registries and legacy systems and also in a cross-border context. At this level public and private organisations are involved as database owners and data aggregators.

On top of the infrastructure level is the data exchange level referring to data utilisation but also to data monitoring by data subjects. At this level, data is registered (or updated) and then exchanged to be re-used from other entities. At this level public and private organisations are involved as data recorders, data providers and data consumers. Individuals and businesses may also be involved as data recorders, i.e. registering own information through an online application. This level includes also the monitoring of collected data and its usage by data subjects, i.e. individuals or businesses. This is an important aspect for data subjects in terms of accountability and transparency.

Further up is the legal level referring to controlling data processing, ensuring data quality and privacy and to monitoring and enforcing relevant legislation, i.e. EU and MS regulations on data privacy and data processing. At this level public and private organisations are involved as data controllers and independent public bodies, e.g. the national ethical committees, as data supervisors.

The top level is the policy level referring to policy development and to decision and establishment of legal frameworks, regulations, and directives. At this level the policy makers both at EU and MS level are involved, as well as relevant government bodies, policy consulting bodies, etc.

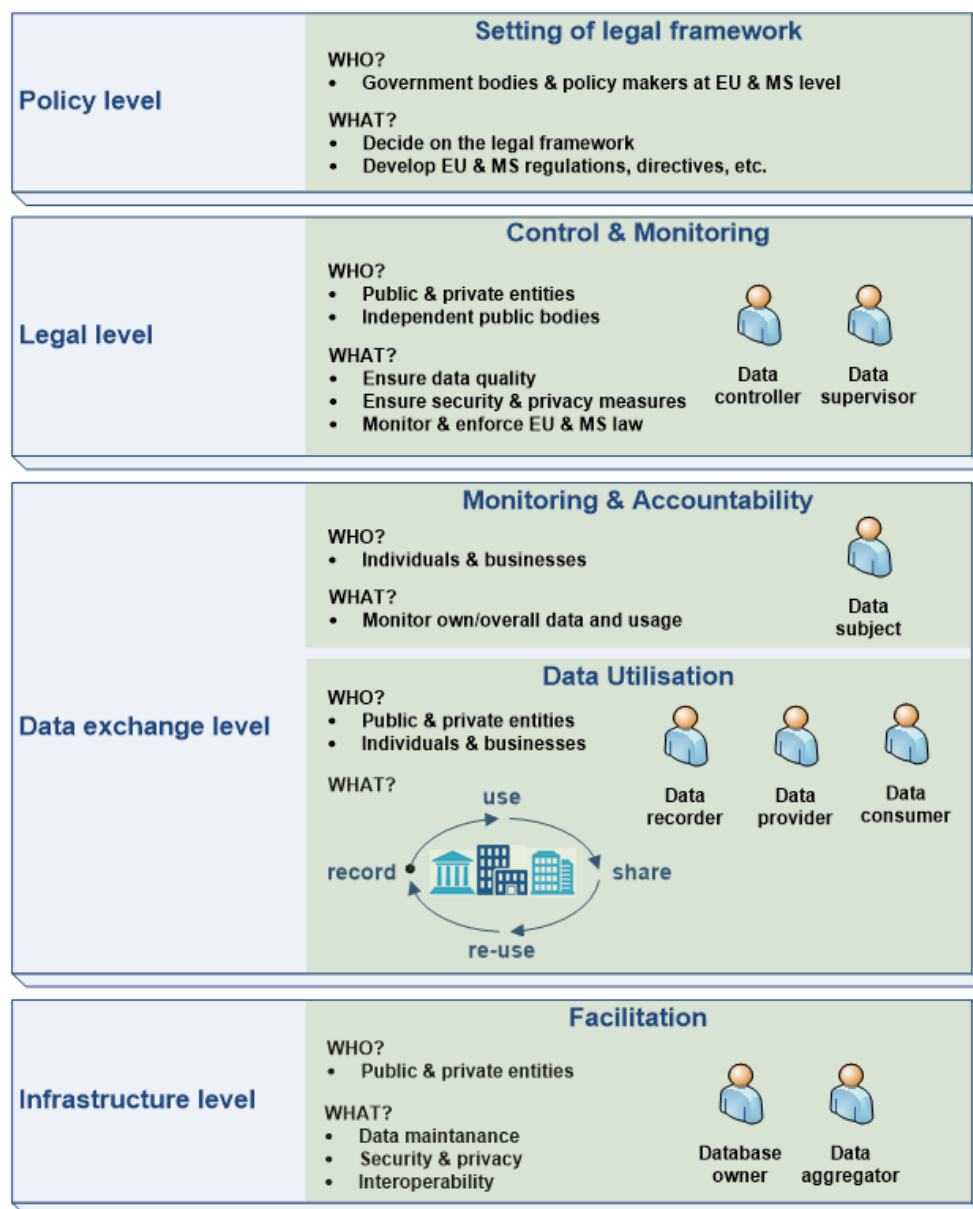


Figure 3. OOP stakeholder model

Table 7. Mapping of stakeholder roles and main characteristics

Stakeholder role	Type	Key concern	Burden reduction	Duties/ obligations	Requirements on data quality
Data subject	Individuals, private entities	<ul style="list-style-type: none"> Providing data only once 	Substantial	Provide new/	Provide correct, up-to-date data



		<ul style="list-style-type: none"> Minimizing interactions with government 		updated data	
Data recorder	Individuals, public or private entities	Registering OOP data in a quick and efficient way	Minimum or none	Register new/ updated data	Correct data registration
Database owner	Public or private entities	Maintaining OOP data according to high quality and security standards	<ul style="list-style-type: none"> Minimum or none at the database level Substantial as a whole, only when many databases are integrated, e.g. one national database instead of many distributed with the same information 	Grant/deny access to database upon controllers' instructions	<ul style="list-style-type: none"> Ensure data maintenance and availability (e.g. backups) Ensure data security (e.g. against external attacks) Ensure data privacy (e.g. anonymisation)
Data aggregator	Public or private entities	Integrating/ aggregating OOP data according to high quality and privacy standards	None; burden is probably increased for this role assuming that there was no need for this role before OOP implementation	Integrate/ aggregate data	<ul style="list-style-type: none"> Ensure zero-error integration/ aggregation of data Ensure data privacy (e.g. anonymisation)
Data provider	Public or private entities	<ul style="list-style-type: none"> Supplying data to consumers in an efficient and secure manner Opening up data 	None; burden is probably increased for this role assuming that there was no data supply before OOP implementation	Grant/ deny supply of specific data upon controllers' instructions	Supply data efficiently and securely
Data consumer	Individuals, public or private entities	<ul style="list-style-type: none"> Obtaining the needed data in a quick, qualitative and trustworthy manner Providing better services to citizens/businesses 	Substantial	Re-use already available OOP data for service provision	<ul style="list-style-type: none"> Utilise the obtained data only for the declared purposes Safeguard the obtained data according to controllers' instructions

Data controller	Public or private entities	<ul style="list-style-type: none"> • Ensuring data quality and security • Ensuring legally compliant data processing 	Minimum to none	<ul style="list-style-type: none"> • Impose security and privacy restrictions to data • Grant/ deny access to or supply of database/ datasets 	<ul style="list-style-type: none"> • Implement appropriate technical and organisational measures to ensure and to be able to demonstrate that processing is performed in accordance with EU and national data protection regulations • Notify the processing operation to the data supervisor
Data supervisor	Independent public bodies (e.g. MS data protection offices and ethical committees)	<ul style="list-style-type: none"> • Protect the fundamental rights and freedoms of natural persons in relation to data processing • Facilitate the free flow of personal data within the EU 	Minimum to none	Grant/ deny data processing to data controllers	<ul style="list-style-type: none"> • Examine data controllers' applications and decide on legal compliance of data processing • Consult governments on data protection law and regulations

8. Domain-specific OOP stakeholder maps

Contrary to the previous section that reported OOP stakeholders from a generic, conceptual perspective, the aim of this section is to report OOP stakeholders in specific situations, i.e. in domain-specific maps. The domains selected are the ones where OOP is being most commonly practiced according to the examined cases, i.e. education, health, taxation and social protection (see also SCOOP4C project deliverable, D1.2: State of play report of best practices, where domain categorisation of existing OOP cases is documented). For each of these domains we provide a stakeholder matrix including the specific stakeholders involved in the examined cases (i.e. exact public bodies, private organisations, types of individuals, etc.), as well as stakeholders' type, roles, key concerns, burden reduction, duties/ obligations and requirements on data quality. Additionally, we provide a domain-specific graphical stakeholder map as a synthesis of the findings from the cases, depicting the main stakeholders of the domain, the roles they undertake and the interactions among them.

8.1. Education

Six cases were examined for developing the stakeholder maps of the education domain. The six cases come from six different countries, i.e. Estonia, Spain, Ireland, the Netherlands and the UK.

8.1.1. Analysis of stakeholders

Each of the education cases contains several stakeholders that have been mapped in . The analysis showed that all cases have similar stakeholders with comparable characteristics, as they all concern a similar application /



subscription process. The two main stakeholders are the applicant or student as the data subject and the higher education institution (HEI) as data consumer. Another important stakeholder is the governmental entity behind the application portal that serves as the interface between the citizen and the HEI. To provide an overview, a graphic (**Fehler! Verweisquelle konnte nicht gefunden werden.**) was created presenting the generic depiction of stakeholders and interactions in the education domain.



Table 8: OOP stakeholders in the Education domain (data for Estonia, Spain, Ireland, the Netherlands and the UK)

Case	Stakeholder	Type	Role	Key Concerns	Burden reduction	Duties/ Obligations	Requirements on data quality
Estonian Education Information System (EHIS)	Address Data System	Public entity	Data provider	N/A	No direct effort on burden reduction.	Provide valuable and authorised information.	Provide valuable and authorised information. Considering personal data protection regulations.
Estonian Education Information System (EHIS)	Citizens (personal data or statistics)	Public entity	Data subject	Access to integrated register of Estonian Education information system. Citizens provide data for this register as well.	Yes, as EHIS integrates different databases, it provides a comprehensive set of information for different kinds of citizens. This could lead to administrative burden reduction for citizens.	Provide complete and up-to-date information.	Provide complete and up-to-date information.
Estonian Education Information System (EHIS)	Estonian Education Information System (EHIS)	Public entity	Data controller, data provider, data aggregator	Integrating different databases of Estonian education system and some other databases such as register of professions and register of taxable persons. Moreover, it facilitates	Yes, as integrator of different databases, EHIS provides a comprehensive set of information for different kinds of citizens. This could lead to administrative burden reduction for government.	Integrate set of different database and provide access for citizens. Provide secure data exchange channel to facilitate data exchange between citizens and different registers. Considering data protection regulations.	Provide secure data exchange channel to facilitate data exchange between citizens and different registers. Considering data protection regulations.



				acquiring of teachers, academic staff working and other people to general, vocational, higher or hobby education.			
Estonian Education Information System (EHIS)	Estonian Unemployment Insurance Fund, Statistics Estonia, Estonian Environment Information Centre, Estonian Rescue Board and other public authorities (Register of Professions), Ministry of the Interior (Population Register), (Punishment Records Register), Ministry of Finance (Register of taxable persons and Register of Business)	Public entity	Data provider	N/A	No direct effort on burden reduction.	Provide valuable and authorised information.	Provide valuable and authorised information. Considering personal data protection regulations.
Estonian Education Information System (EHIS)	Examination Information System	Public entity	Data provider	N/A	No direct effort on burden reduction.	Provide valuable and authorised information.	Provide valuable and authorised information. Considering personal data protection regulations.



Estonian Education Information System (EHIS)	Public Administrations and other officials	Public and private entities	Data consumer	N/A	Yes, these entities reduce administrative burden of public administrations as they reuse recorded data from different sectors.	Reuse provided data instead of asking citizens to repeatedly provide it.	Reuse of authorised information.
Interoperability node of the Spanish University System (NISUE)	Academics	Individuals / Public entities	Data subject, data provider, data consumer	N/A	N/A	Provides and consumes data	N/A
Interoperability node of the Spanish University System (NISUE)	MINHAP (Ministry of Finance and Public Administration of the national government)	Public entity	Data provider, data consumer, database owner	N/A	N/A	Provides and consumes data	N/A
Interoperability node of the Spanish University System (NISUE)	RedIRIS (the Spanish academic and research network)	Public entity	Data consumer	N/A	N/A	N/A	N/A
Interoperability node of the Spanish University System (NISUE)	Students	Individuals	Data subject, data provider, data consumer	N/A	N/A	N/A	N/A
Interoperability	The Conference of	Public	Data	N/A	N/A	N/A	N/A



node of the Spanish University System (NISUE)	Principals of Spanish Universities (CRUE)	entity	consumer				
Central Applications Office (CAO), IE	CAO	Private entity	Data controller, data provider, database owner	Enhance interaction both between the CAO and applicants, and the CAO and admissions officers.	N/A	Provide secure data exchange channel to share data with universities, colleges and potential students. Provide corresponding data for each application for universities and colleges. Provide information regarding to the result of application for applicants. Provide complete and up-to-date information in "CAO Application Handbook" every year. Considering personal data protection regulations.	Provide complete and up-to-date information in "CAO Application Handbook" every year. Considering personal data protection regulations.
Central Applications Office (CAO), IE	Colleges	Public/private entity	Data consumer	Receive authorised information and documents. Process applications.	No direct effort on burden reduction.	Using received data from CAO and process applications. Provide the result of application with complete explanations for applicants via CAO.	Provide the result of application with complete explanations for applicants via CAO.



Central Applications Office (CAO), IE	Irish Higher Education Institutions (HEIs)	Public and private entities	Data provider, data consumer	Contact applicants	N/A	N/A	N/A
Central Applications Office (CAO), IE	Potential Students	Individuals	Data subject	Applying to university or college easier and faster, provide submissions and fees, receive information about different aspects of Irish education system including point-base application system or important dates.	Yes, potential students provide information and documents once for CAO and applying for different universities and colleges. CAS provides comprehensive set of information regarding to education in the Ireland which reduce different kinds of administrative burden for citizens as potential students.	Provide correct and complete information and documents. Foreign applicants should provide official translation of their documents if documents are not issued in Irish or English language.	Provide correct and up-to-date information. Provide all mandatory documents. Foreign applicants should provide official translation of their documents if documents are not issued in Irish or English language. Keep their account information (password) safe and confidential.
Central Applications Office (CAO), IE	Universities	Public and private entities	Data consumer	Receive authorised information and documents. Process applications.	No direct effort on burden reduction.	Using received data from CAO and process applications. Provide the result of application with complete explanations for applicants via CAO.	N/A
Sisestumise InfoSüsteem (SAIS), EE	Applicants	Individuals	Data subject, data provider, data consumer	Applying to university	Education data is provided from a single point	Provide valuable and authorised information.	N/A



Sisseastumise InfoSüsteem (SAIS), EE	Estonian Education Information System (EHIS)	Non-profit entity	Data controller	N/A	N/A	N/A	N/A
Sisseastumise InfoSüsteem (SAIS), EE	Examination Information System (EIS)	Public entity	Data provider	N/A	N/A	N/A	N/A
Sisseastumise InfoSüsteem (SAIS), EE	Ministry of Education	Public entity	Database owner	Ensuring data security and legally compliant data processing.	N/A	N/A	N/A
Sisseastumise InfoSüsteem (SAIS), EE	ÕIS (The study information system in universities and colleges)	Public entity	Data provider, data consumer	N/A	N/A	N/A	N/A
Sisseastumise InfoSüsteem (SAIS), EE	Population register (RR)	Public entity	Data provider	N/A	N/A	N/A	N/A
Sisseastumise InfoSüsteem (SAIS), EE	The Information Technology Foundation for Education (HITSA)	Public entity	Data controller	Technical maintenance	No direct effort on burden reduction.	N/A	N/A
Sisseastumise InfoSüsteem (SAIS), EE	Universities	Public entities	Data consumer, data provider	Getting correct information about applicants	N/A	N/A	N/A
Sisseastumise InfoSüsteem (SAIS), EE	VVIS (System for applicants from abroad)	Public entity	Data provider, data consumer	Provide data	N/A	N/A	N/A



Studielink, NL	Applicants	Individuals	Data subject, data provider, and data consumer	Applying to university	Education data is provided from a single point	Provide valuable and authorised information.	Provide valid, up-to-date and correct information during the application process.
Studielink, NL	DUO (Ministry of Education)	Public entity	Data controller	Ensuring data security and legally compliant data processing.	N/A	Provides technical support in order to maintain the continuous access.	Ensure the data exchange between the authorised actors (such as applicants and universities), arrange the measures to secure the private information and establish certified access.
Studielink, NL	Higher Education Institutions (Universities)	Public entity	Data provider, data consumer	Getting correct information about applicants	Education data is accessible from a single point and once	Supports the correct processing of applications as well as informs the students on the enrolment results.	Applications' information should be valid, up-to-date and correct.
Universities and Colleges Admissions System (UCAS), UK	Citizens	Individuals	Data subject, Data provider, data consumer	Applying to university easier and faster, receive information and advice about qualification and subject choices.	Yes, as candidate students provide information and documents just once and then UCAS share them with several universities in safe and secure manner. Consequently, administrative burden for citizens will be reduced. Moreover, complete	Provide correct and complete information and documents. Foreign applicants should provide official translation of their documents if documents are not issued in English language.	Citizens expected to provide up-to-date and valid information just in English. If any document is not in English language originally, official translation is necessary.



					information regarding British universities and process of applying for higher education institutes reduced administrative burden for citizens.		
Universities and Colleges Admissions System (UCAS), UK	Universities	Private and public entity	Data consumer	Getting correct information about applicants. Receive on time applications regarding to fixed timetable. Process received applications.	No direct effort on burden reduction.	Using provided data and then report the result of application to UCAS. In case of missing document or conditional offer provide corresponding information for applicants via UCAS.	Provide complete information about the result of applications.
Universities and Colleges Admissions System (UCAS), UK	UCAS Organisation	Non-profit entity	Data controller, data provider	Better use of provided information and documents of applicants. Provide authorised information for universities.	Yes, as candidate students provides information and documents just once and then UCAS share them with several universities in safe and secure manner, UCAS will face lower level of burden as it receive all information once.	Provide complete and up-to-date information regarding to university and education system in the UK for citizens. Moreover, secure data exchange infrastructure to share applicants' information and documents with universities. Considering personal data protection.	Facilitate secure data exchange channel between for sharing information and documents with universities and applicants. Considering personal data protection and security issues. Provide complete and up-to-date information about education system in up



							for citizens as potential applicants.
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8.1.2. Synthesis of education-specific stakeholder map

The aforementioned analysis allowed the synthesis of a domain-specific graphical stakeholder map (**Fehler! Verweisquelle konnte nicht gefunden werden.**) depicting the main stakeholders of the education domain, the roles they undertake and the interactions among them. The starting point for describing the stakeholders in the educational domain are applicants and students. An applicant who wants to apply to a higher education institution (HEI) has to register her- or himself through a portal that is provided by a governmental institution. During the registration, the applicant has to enter her or his data into the system. Therefore, the applicant undertakes the role of a data subject and data recorder. As personal and educational data can be retrieved through existing registries, information from the databases of the educational information registry and the population registry is provided to the application portal. The governmental institutions, namely the Ministry of Interior and the Ministry of Education, are the database owners and data providers. Moreover, the ministries ensure data quality in their role as data controllers. During the retrieving process, the application portal fulfils its role as data aggregator, integrating all information into the application form. Once the required data is collected in the application portal, the application form is provided to the desired HEI(s), which is then processing the information through its own information system. The HEI is therefore the data consumer, recorder and controller within this process. During the whole procedure and in the overall setting the Ministry of Education possesses the role of the data controller towards the legal entity behind the application portal and the HEI(s), ensuring data security and legally compliant data processing.

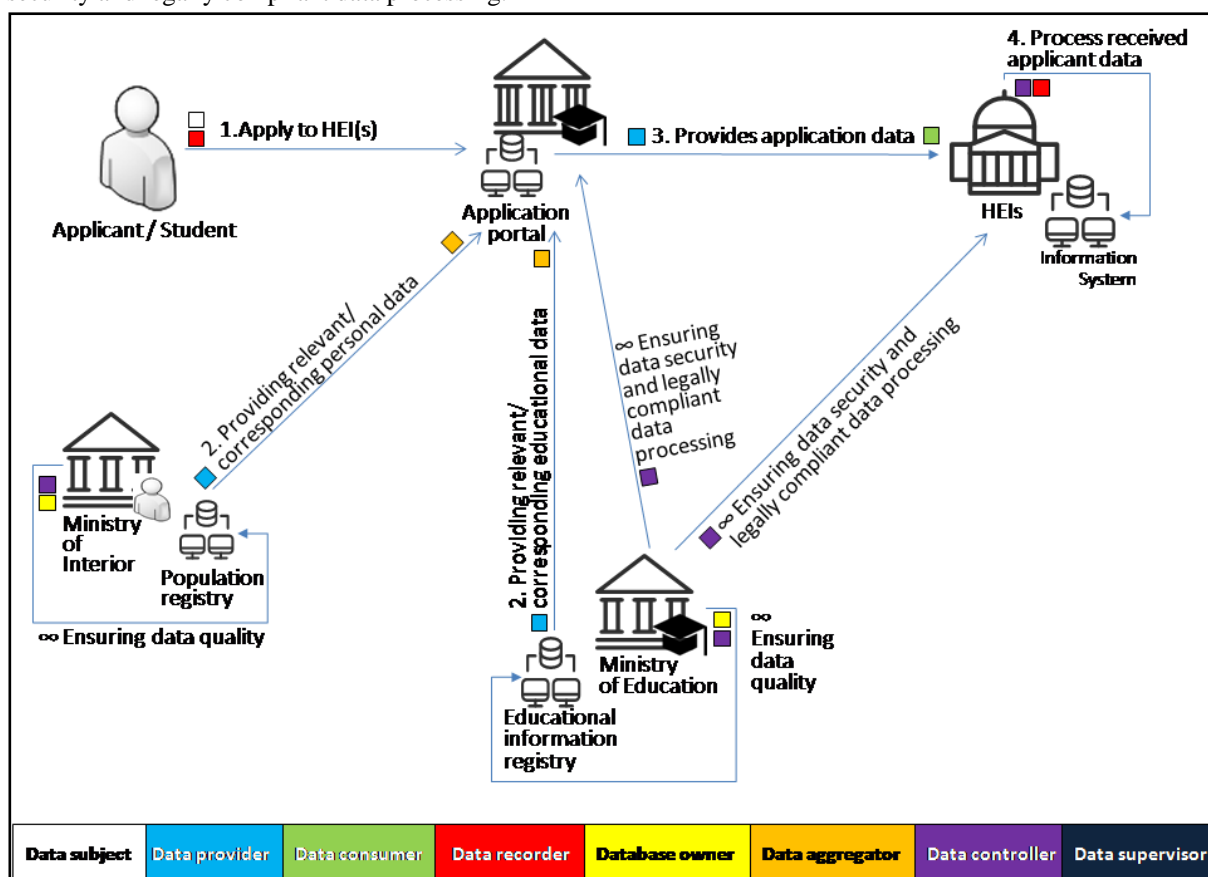


Figure 4: Education domain: main OOP stakeholders and interactions



8.2. Health

Six cases were examined for developing the stakeholder maps of the health domain. Five of these cases come from Estonia and one from Austria.

8.2.1. Analysis of stakeholders

Each of the health cases contains several stakeholders that have been mapped in .

The analysis showed that health cases have similar stakeholders with comparable characteristics. This is not surprising since most cases come from the same country, nonetheless similarities between the two different countries were also observed. Focal point in all health cases is the exchange of patient / health data among patients, health care professionals and health information systems. These are the main stakeholders of the health domain. To provide an overview, a graphic (**Fehler! Verweisquelle konnte nicht gefunden werden.**) was created presenting the generic depiction of stakeholders and interactions in the health domain.



Table 9: OOP stakeholders in the Health domain (data for Austria and Estonia)

Case	Stakeholder	Type	Role	Key Concerns	Burden reduction	Duties/ Obligations	Requirements on data quality
Electronic health records (ELGA), AT	ELGA GMBH	Public entity	Data controller, database owner	Simplifying the process of accessing the health records for patients and doctors	This central integrated information repository reduces administrative burden for both patients and health system providers	Grant access to medical data. Connect health institutions and make the relevant health data available digitally by means of a link	Ensure privacy, security
Electronic health records (ELGA), AT	Patients	Individuals	Data subject, data provider, data consumer	Quick and easy access.	Patients see all health information from different institutions	Provide correct and up-to-date data	Integrity and high quality of data
Electronic health records (ELGA), AT	Hospitals, doctors, care facilities, pharmacies	Non profit entity, private entity	Data provider, data consumer	Open data for other stakeholders	Several health service providers are working together	Provide access to the medical records	Integrity of data
Estonian Central Health Information System (EHR), EE	Centre of Health and Welfare Information Systems (TEHIK)	Public entity	Data controller, database owner, data aggregator, data consumer	Maintaining data	Significantly diminished administrative burden from citizens and health system	Harmonised and agreed workflows, standards, classificatory and data models among the health professionals	Availability, integrity and confidentiality of health data
Estonian Central Health Information System	Ministry of Internal Affairs (Population register)	Public entity	Database owner, data provider	Open X-road services	Hassle-free support	Grants access to services	Up-to-date data, integrity of data.



(EHR), EE							
Estonian Central Health Information System (EHR), EE	Centre of Registers and Information Systems (RIK). (Private entity register)	Public entity	Database owner, data provider	Open X-road services	Hassle-free support	Grants access to services	Up-to-date data, integrity of data.
Estonian Central Health Information System (EHR), EE	Universities	Public entity, private entity, non profit entity	Data consumer	Conduct of research based on different linked databases	Well organised, linked databases facilitate research	Fulfilment of data privacy and security requirements	Set of identifiers, classifications, dictionaries ensure linking of data
Estonian Central Health Information System (EHR), EE	Scientists	Public entity, private entity, non profit entity	Data consumer	Conduct of research based on different linked databases	Well organised, linked databases facilitate research	Fulfilment of data privacy and security requirements	Set of identifiers, classifications, dictionaries ensure linking of data
Estonian Central Health Information System (EHR), EE	Land Board (Address Data System)	Public entity	Database owner, data provider	Open X-road services	Hassle-free support	Normalisation of address data. Enabler.	Up-to-date data, integrity of data.
Estonian Central Health Information System (EHR), EE	Health Care providers (GP, Hospital, Emergency service, Dentists IS)	Non profit entity, private entity, public entity	Data provider, data consumer, database owner	Registering data. Using the health history.	Well documented events, cooperation between stakeholders facilitate activities	Registering data	Availability, integrity and confidentiality of health data



Estonian Central Health Information System (EHR), EE	State Agency of Medicine (Medicines Coding Centre)	Public entity	Data provider, database owner	Management of information about medicines. Open data for case.	One coding centre for whole health system ensures interoperability and increases efficiency	Grants access to the data. Enabler.	Availability and integrity
Estonian Central Health Information System (EHR), EE	State Agency of Medicine (Register of Handlers of medicines – Licences of Pharmacies and pharmacists)	Public entity	Data provider, database owner	Management of information about handlers and licences. Open data for case.	No paperwork	Grants access to the data. Enabler.	Availability and integrity
Estonian Central Health Information System (EHR), EE	Health Insurance Foundation (Health Insurance Status Register)	Public entity	Data provider, database owner	Open data for case.	Paperless service	Grants access to the data. Enabler.	Availability and integrity
Estonian Central Health Information System (EHR), EE	Health care Board (Health care providers Register)	Public entity	Data provider, database owner	Management of information about care providers. Open data for case	No paperwork	Grants access to the data. Enabler.	Availability and integrity
Estonian Central Health Information System (EHR), EE	Health care Board (Health professionals Register)	Public entity	Data provider, database owner	Management of information about health professionals. Open data for case	No paperwork	Grants access to the data. Enabler.	Availability and integrity
Estonian	Centre of Health and	Public entity	Data consumer	Anonymising data	Reuse data.	Generating Statistics	Availability and



Central Health Information System (EHR), EE	Welfare Information Systems (Statistics Portal)						integrity
Estonian Central Health Information System (EHR), EE	Centre of Health and Welfare Information Systems (HIS X-Road MISP – Portal for GP)	Public entity	Data provider, data consumer, data owner	Handling events	Better access to services. Decreasing cost	Registering data	Availability and integrity
Estonian Central Health Information System (EHR), EE	Centre of Health and Welfare Information Systems (HIS X-Road MISP – portal for Emergency Mobile Stations)	Public entity	Data provider, data consumer, data owner	Handling events	Better access to services. Decreasing cost.	Registering data	Access to the critical data
Estonian Central Health Information System (EHR), EE	Health Insurance Foundation (Prescription Centre)	Public entity	Database owner, data provider	Maintaining prescriptions	Reduction burdens between citizen, doctors, pharmacist	Grant access: pharmacists, citizen	Quality
Estonian Central Health Information System (EHR), EE	Centre of Health and Welfare Information Systems (Medical Images Repository)	Public entity	Database owner, data provider	Maintaining images	Case significantly diminished administrative burden in health system	Grant access	Availability and integrity
Estonian	Centre of Health and	Public entity	Data owner,	Open information for	24 h access for citizens	Grant access	Usability



Central Health Information System (EHR), EE	Welfare Information Systems (Patient Portal)		data provider, data consumer	patients			
Estonian Central Health Information System (EHR), EE	Road Administration Board	Public entity	Data consumer	Get medical certificates	Paperless service	Check medical certificates	Availability and integrity
Estonian Central Health Information System (EHR), EE	Social Security Board	Public entity	Data consumer	Get information	Paperless service	data reuse	Availability and integrity
Estonian Central Health Information System (EHR), EE	Health Insurance Foundation	Public entity	Data consumer	Get information	Paperless service	data reuse	Availability and integrity
Estonian Central Health Information System (EHR), EE	Medical Registries (Cancer Register) – National Health Development Institute	Public entity	Data consumer	Get information	Paperless service	data reuse	Availability and integrity
Estonian Central Health	Medical Registries (Infection Diseases register)	Public entity	Data consumer	Get information	Paperless service	data reuse	Availability and integrity



Information System (EHR), EE	– Health Care Board						
Estonian Central Health Information System (EHR), EE	State Information Board (X-road, eID, Mobile-ID, ID-card, portal eesti.ee)	Public entity	Data aggregator, data supervisor	Interoperability, management of infrastructure services, aggregation of services for citizen	Agreements between stakeholders, implementation of information policy	Provide infrastructure services, implementation of security policy, enabling data exchange	Availability, integrity and confidentiality
Estonian Central Health Information System (EHR), EE	Patients	Individuals	Data subject	Quick and easy health service. Data subjects see what government knows about them.	All health events are available from one environment.	Management of her/his data. Management of rights (including delegation of rights)	Availability of data and services
Digital Prescription, EE	Health Insurance Foundation (Prescription Centre)	Public entity	Database owner, data provider	Maintaining prescriptions	Reduction of burden between citizen, doctors, pharmacists	Grant access to: pharmacists, citizen	Quality
Digital Prescription, EE	Centre of Health and Welfare Information Systems (Health Information System)	Public entity	Data controller, database owner, data aggregator, data consumer	Maintaining information	Significantly diminished administrative burden from citizen and health system	Harmonised and agreed workflows, standards, classificatory and data models among the health professionals	Availability, integrity and confidentiality of health data
Digital Prescription, EE	Ministry of internal Affairs (Population register)	Public entity	Database owner, data provider	Open X-road services	Hassle-free support	Grants access to services	Up-to-date data, integrity of data.
Digital	Centre of Registers and	Public entity	Database owner,	Open X-road services	Hassle-free support	Grants access to services	Up-to-date data,



Prescription, EE	Information Systems (RIK). (private entity register)		data provider				integrity of data.
Digital Prescription, EE	Patients	Individuals	Data subject	Quick and easy health service Data subjects see what government knows about them.	All health events are available from one environment.	Management her/his data. Management of rights (including delegation of rights)	Availability of data and services
Digital Prescription, EE	Land Board (Address Data System)	Public entity	Database owner	Open X-road services	Hassle-free support	Normalisation of address data	Up-to-date data, integrity of data.
Digital Prescription, EE	Pharmacists	Private entity	Data consumer, data provider	Sale of medicines	Paperless prescription	Check grants of patient (patient relatives)	Availability of data
Digital Prescription, EE	Health Care providers	Private entity, public entity	Data consumer, data provider	Issue of prescriptions, Check patient behaviour	Paperless prescription, issuing a recurrent prescription for chronic patients	Issue of prescriptions, Check patient behaviour	Availability of data
Digital Prescription, EE	State Agency of Medicine (Medicines Coding Centre)	Public entity	Database owner, data provider	Management of information about medicines. Open data for case.	One coding centre for whole health system ensure interoperability and increases efficiency	Grants access to the data	Availability and integrity of data
Digital Prescription, EE	State Agency of Medicine (Register of Handlers of medicines – Licences of	Public entity	Database owner, data provider	Management of information about handlers and licences.	Paperless services	Grants access to the data	Availability and integrity of data



	Pharmacies and pharmacists)			Open data for case.			
Digital Prescription, EE	Health Care Board (Medical devices Registry)	Public entity	Database owner, data provider	Open services for stakeholders	Paperless services	Grants access	Availability and integrity of data
Digital Prescription, EE	Health Insurance Foundation (Health Insurance Status Register)	Public entity	Database owner, data provider	Open data for case.	Paperless services	Grants access to the data	Availability and integrity of data
Digital Prescription, EE	Health care Board (Health care providers Register)	Public entity	Database owner, data provider	Open data for case	Paperless services	Grants access to the data	Availability and integrity of data
Digital Prescription, EE	Health care Board (Health professionals Register)	Public entity	Database owner, data provider	Open data for case	Paperless services	Grants access to the data	Availability and integrity of data
Digital Prescription, EE	Centre of Health and Welfare Information Systems (HIS X-Road MISP – Portal for GP)	Public entity	Data provider, data consumer, database owner	Handling events	Better access to services. Decreasing cost	Registering data	Availability and integrity of data
Digital Prescription, EE	Centre of Health and Welfare Information Systems (HIS X-Road MISP – Portal for Pharmacies)	Public entity	Data provider, data consumer, database owner	Handling events	Better access to services. Decreasing cost	Registering data	Availability and integrity of data
Digital Prescription,	Centre of Health and Welfare Information	Public entity	Data provider, data consumer,	Handling events	Better access to services. Decreasing	Registering data	Access to the critical data



EE	Systems (HIS X-Road MISP – portal for Emergency Mobile Stations)		database owner		cost		
Digital Prescription, EE	State Information Board (X-road, eID, Mobile-ID, ID-card, portal eesti.ee)	Public entity	Data aggregator, data supervisor	Interoperability, management of infrastructure services, aggregation of services for citizen	Agreements between stakeholders, implementation of information policy	Provide infrastructure services, implementation of security policy, enabling data exchange	Availability, integrity and confidentiality
Doctor-doctor-consultation, EE	Centre of Health and Welfare Information Systems (Health Information System services – e-consultation)	Public entity	Data controller, database owner, data aggregator, data consumer	Maintaining information	Significantly diminished administrative burden from citizen and health system	Harmonised and agreed workflows, standards, classificatory and data models among the health professionals	Availability, integrity and confidentiality health data
Doctor-doctor-consultation, EE	Ministry of internal Affairs (Population register)	Public entity	Database owner, data provider	Open X-road services	Hassle-free support	Grants access to services	Up-to-date data, integrity of data.
Doctor-doctor-consultation, EE	Centre of Registers and Information Systems (RIK). (private entity register)	Public entity	Database owner, data provider	Open X-road services	Hassle-free support	Grants access to services	Up-to-date data, integrity of data.
Doctor-doctor-consultation, EE	Land Board. (Address Data System)	Public entity	Database owner, data provider	Open X-road services	Hassle-free support	Normalisation of address data	Up-to-date data, integrity of data.
Doctor-doctor-consultation,	Health care Board (Health care providers Register)	Public entity	Database owner, data provider	Open data for case	Paperless services	Grants access to the data	Availability and integrity



EE							
Doctor-doctor-consultation, EE	Health Insurance Foundation (Health Insurance Status Register)	Public entity	Database owner, data provider	Open data for case.	Paperless services	Grants access to the data	Availability and integrity
Doctor-doctor-consultation, EE	Health Care providers (GP, Hospital, Emergency service, Dentists IS)	Non profit entity, private entity, public entity	Data provider, data consumer, database owner	Registering data. Using the health history	Well documented events, cooperation between stakeholders facilitate activities	Registering data	Availability, integrity and confidentiality of health data
Doctor-doctor-consultation, EE	Health Insurance Foundation (Health Insurance Status Register)	Public entity	Database owner, data provider	Open data for case.	Paperless services	Grants access to the data	Availability and integrity
Doctor-doctor-consultation, EE	Health care Board (Health care providers Register)	Public entity	Database owner, data provider,	Open data for case	Paperless services	Grants access to the data	Availability and integrity
Doctor-doctor-consultation, EE	Health care Board (Health professionals Register)	Public entity	Database owner, data provider	Open data for case	Paperless services	Grants access to the data	Availability and integrity
Doctor-doctor-consultation, EE	Centre of Health and Welfare Information Systems (HIS X-Road MISIP – Portal for GP)	Public entity	Data provider, data consumer, database owner	Handling events	Better access to services. Decreasing cost	Registering data	Availability and integrity
Doctor-doctor-consultation, EE	State Information Board (X-road, eID, Mobile-ID, ID-card)	Public entity	Data aggregator, data supervisor	Interoperability, management of infrastructure services	Agreements between stakeholders, implementation of information policy	Provide infrastructure services, implementation of security policy, enabling data exchange	Availability, integrity and confidentiality



Medical Certificate, EE	Centre of Health and Welfare Information Systems (Health Information System services - certificates)	Public entity	Data controller, database owner, data aggregator, data consumer	Maintaining	Significantly diminished administrative burden in health system	Harmonised and agreed workflows, standards, classificatory and data models among the health professionals	Availability, integrity and confidentiality of health data
Medical Certificate, EE	Ministry of internal Affairs (Population register)	Public entity	Database owner, data provider	Open X-road services	Hassle-free support	Grants access to services	Up-to-date data, integrity of data.
Medical Certificate, EE	Centre of Registers and Information Systems (RIK). (private entity register)	Public entity	Database owner, data provider	Open X-road services	Hassle-free support	Grants access to services	Up-to-date data, integrity of data.
Medical Certificate, EE	Citizens needing medical certificates	Individuals	Data subject, data owner	Quick and easy health service	All health events are available from one environment	Management her/his data. Management of rights (including delegation of rights)	Knowing what government knows about me. Availability of services
Medical Certificate, EE	Health Care providers (GP, Hospital, Emergency service, Dentists IS)	Non profit entity, private entity, public entity	Data provider, data consumer, database owner	Registering data. Use of the health history	Well documented events, cooperation between stakeholders facilitate activities	Registering data	Availability, integrity and confidentiality health data
Medical Certificate, EE	Health care Board (Health care providers Register)	Public entity	Database owner, data provider	Open data for case.	N/A	Grants access to the data, enabling data exchange	Availability and integrity
Medical Certificate, EE	Centre of Health and Welfare Information Systems (HIS X-Road MISP – Portal for GP)	Public entity	Data provider, data consumer, database owner	Handling events	Better access to services. Decreasing cost	Registering data	Availability and integrity



Medical Certificate, EE	Centre of Health and Welfare Information Systems (Patient Portal)	Public entity	Data owner, data provider, data consumer	Open information for patients	N/A	grant access	Usability
Medical Certificate, EE	Road Administration Board	Public entity	Data consumer	Get medical certificates	N/A	Check medical certificates	Availability and integrity
Medical Certificate, EE	State Information Board (X-road, eID, Mobile-ID, ID-card)	Public entity	Data aggregator, data supervisor	Interoperability, management of infrastructure services	Agreements between stakeholders, implementation of information policy	Provide infrastructure services, implementation of security policy, enabling data exchange	Availability, integrity and confidentiality
Medical Digital Image Bank, EE	Centre of Health and Welfare Information Systems (Medical Digital Images Bank (PACS Repository))	Public entity/private entity	Database owner, data provider, data consumer	Maintaining digital images	Reduction burdens between citizen, doctors	Grant access: doctors, citizen	Quality
Medical Digital Image Bank, EE	Centre of Health and Welfare Information Systems (Health Information System)	Public entity	Data controller, database owner, data aggregator, data consumer	Maintaining information	Significantly diminished administrative burden from citizen and health system	Harmonised and agreed workflows, standards, classificatory and data models among the health professionals	Availability, integrity and confidentiality of health data
Medical Digital Image Bank, EE	Ministry of internal Affairs (Population register)	Public entity	Database owner, data provider	Open X-road services	Hassle-free support	Grants access to services	Up-to-date data, integrity of data.
Medical Digital Image Bank, EE	Centre of Registers and Information Systems (RIK). (private entity register)	Public entity	Database owner, data provider	Open X-road services	Hassle-free support	Grants access to services	Up-to-date data, integrity of data.



Medical Digital Image Bank, EE	Citizens	Individuals	Data subject	Quick and easy health service. Data subjects see what government knows about them..	All health events are available from one environment	Management her/his data. Management of rights (including delegation of rights)	Availability of data and services
Medical Digital Image Bank, EE	Health Care providers (GP, Hospital, Emergency service, Dentists IS)	Private entity, public entity	Data provider, data consumer, database owner	Registering data. Use of the health history	Well documented events, cooperation between stakeholders facilitate activities	Registering data	Availability, integrity and confidentiality of health data
Medical Digital Image Bank, EE	Health care Board (Health care providers Register)	Public entity	Database owner, data provider	Open data for case	Paperless services	Grants access to the data	Availability and integrity
Medical Digital Image Bank, EE	Health care Board (Health professionals Register)	Public entity	Database owner, data provider	Open data for case	Paperless services	Grants access to the data	Availability and integrity
Medical Digital Image Bank, EE	Centre of Health and Welfare Information Systems (HIS X-Road MISP – Portal for GP)	Public entity	Data provider, data consumer, database owner	Handling events	Better access to services. Decreasing cost	Registering data	Availability and integrity
Medical Digital Image Bank, EE	State Information Board (X-Road, eID, Mobile-ID, ID-card)	Public entity	Data aggregator, data supervisor	Interoperability, management of infrastructure services	Agreements between stakeholders, implementation of information policy	Provide infrastructure services, implementation of security policy, enabling data exchange	Availability, integrity and confidentiality

8.2.2. Synthesis of health-specific stakeholder map

The aforementioned analysis allowed the synthesis of a domain-specific graphical stakeholder map (**Fehler! Verweisquelle konnte nicht gefunden werden.**) depicting the main stakeholders of the health domain, the roles they undertake and the interactions among them. The starting point for describing the stakeholders in the health domain are the patients. The patients and doctors provide patient's health data to the public administration and private health care providers only once. The public administrations get those data and process them into a base registry. The base registries can be maintained from different public authorities (database owners). Pharmacists are also involved for accessing e-prescriptions. After the purchase of medicine by patients, e-dispensation report is generated for the doctors. The back-end systems (base and secondary registries) and front-end systems (portals and information systems) are separated. Data is stored in registries. Front end systems request data from registries and deliver it to the data consumers. Many stakeholders in this domain are acting both as data consumers and data providers.

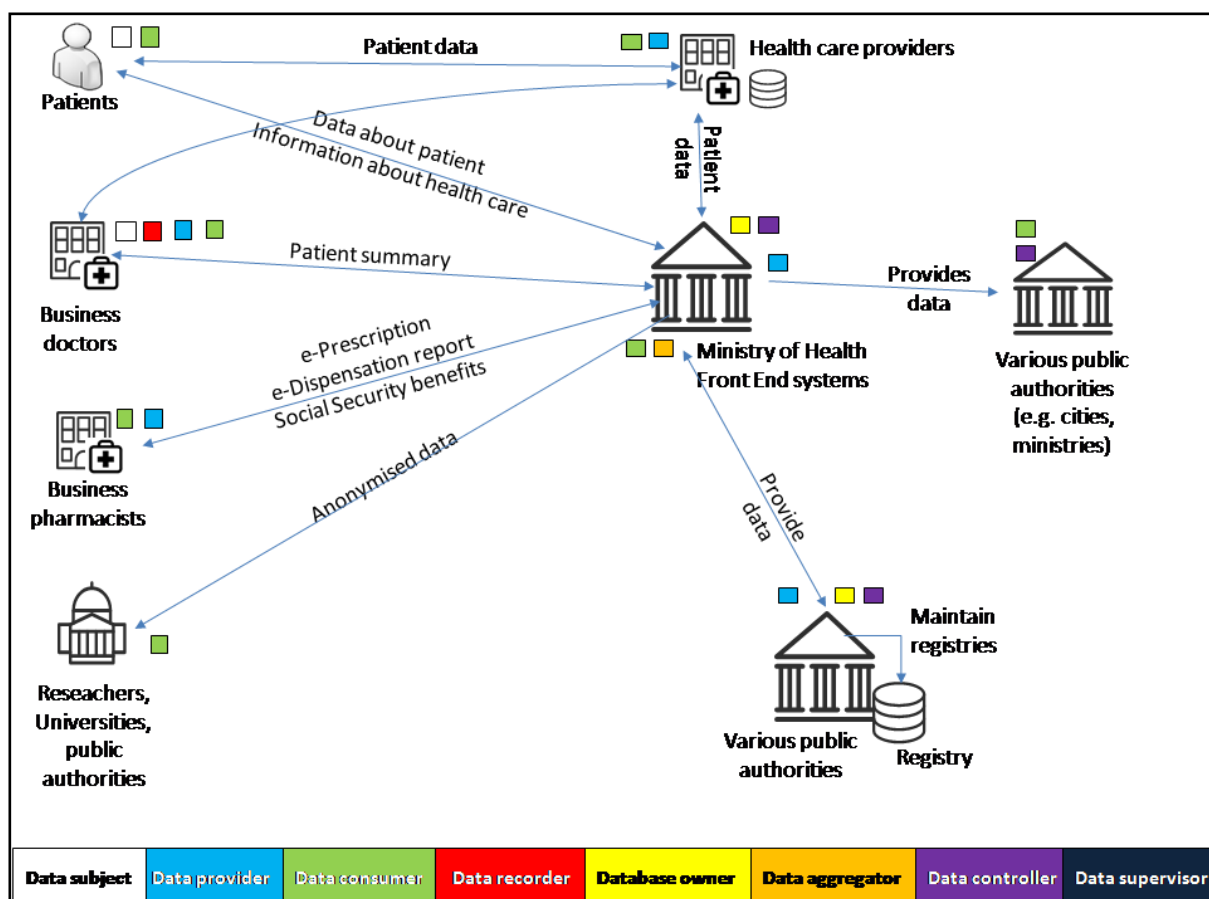


Figure 5: Health domain: main OOP stakeholders and interactions



8.3. Taxation

Five cases were examined for developing the stakeholder maps of the taxation domain. The five cases come from five different countries, i.e. Greece, Austria, the UK, France, and Estonia.

8.3.1. Analysis of stakeholders

Each of the taxation cases contains several stakeholders that have been mapped in .

The analysis showed that all cases have similar stakeholders with comparable characteristics, as they mainly concern the same process, i.e. tax declaration. There are two main stakeholders in the taxation domain, i.e. the taxpayers, both natural and legal entities who are the data subjects; and the Ministry of Finance/Taxation authority who maintains the relevant taxation systems and acts as data provider and data consumer. Other stakeholders involved are various public and private entities who may provide or consumer relevant personal data. To provide an overview, a graphic (**Fehler! Verweisquelle konnte nicht gefunden werden.**) was created presenting the generic depiction of stakeholders and interactions in the taxation domain.



Table 10: OOP stakeholders in the Taxation domain (data for Greece, Austria, the UK, France, Estonia)

Case	Stakeholder	Type	Role	Key Concerns	Burden reduction	Duties/ Obligations	Requirements on data quality
TAXIS, GR	Ministry of Finance	Public entity	Database owner, data provider, data consumer	Timely and error-free collection of financial reports	Yes, since fewer interactions for verifying tax data with citizens are needed.	Provide a reliable system for financial reporting, responsiveness to frequent law changes	Ensure data privacy and security, high- quality data
TAXIS, GR	Citizens	Individ uals	Data subject, data recorder	Quick and easy declaration of financial reports	Yes, for some citizen categories: - Wages paid by the government are automatically entered in the online tax declaration form, thus citizens need no longer visit the tax authority to provide proof of income. - Interest paid by banks and corresponding tax held are automatically entered in the online tax declaration form, thus citizens need no longer visit the banks to get this information themselves. - In the case of tax return, a deposit is made to the bank account provided	Deliver financial reports (e.g. income tax) on time	Provide correct, up-to- date data



					by the citizen, thus citizens need no longer visit the tax authority to get the money/check.		
TAXIS, GR	Businesses	Private entities	Data subject, data recorder	Quick and easy declaration of financial reports	N/A	Deliver financial reports (e.g. income tax, VAT) on time	Provide correct, up-to-date data
TAXIS, GR	NGOs	Non-profit entities	Data subject, data recorder	Quick and easy declaration of financial reports	N/A	Deliver financial reports (e.g. income tax, VAT) on time	Provide correct, up-to-date data
FinanzOnline (FON), AT	Federal Ministry of Finance	Public entity	Database owner, data consumer	Timely and error-free collection of financial reports	Processing tax returns online relieves the burden on the government budget. Since 2013, the administrative expenses have been reduced by about 330 million Euros.	Provide a reliable system for financial reporting	Ensure data privacy and security, high-quality data
FinanzOnline (FON), AT	Citizens	Individuals	Data subject, data recorder	Quick and easy declaration of financial reports	Processing tax returns online saves times, because there is no travel time or queuing.	Deliver financial reports (e.g. income tax) on time	Provide correct, up-to-date data
FinanzOnline (FON), AT	Businesses	Private entities	Data subject, data recorder	Quick and easy declaration of financial reports	Processing tax returns online saves times, because there is no travel time or queuing.	Deliver financial reports (e.g. income tax, VAT) on time	Provide correct, up-to-date data
Making Tax Digital (MTD),	HM Revenues and Customs	Public entity	Database owner, data consumer	Timely and error-free collection of financial reports	Over 10 million customers fill in a tax return to tell HMRC about their circumstances and income. This is a	Provide a reliable system, incl. apps and other digital	Ensure data privacy and security, high-quality data



UK					burden for customers and inefficient for HMRC as well: mistakes can be made or the information can be wrong or submitted too late, meaning the right tax is not collected at the right time and HMRC has to take action. This can lead to penalties and interest charges for the customer which could have been avoided. More effective use of third party information, that is, information provided to HMRC by someone other than the customer or their agent, will reduce the reporting burden on customers and reduce errors, making it easier to declare the right tax.	tools, for financial reporting	
Making Tax Digital (MTD), UK	Taxpayers	Individuals	Data subject, data recorder	<i>Get their tax right and to keep their tax affairs current</i>	Customers (and their agents) will be able to interact with HMRC digitally and at a time to suit them. Over 10 million customers fill in a tax return to tell HMRC about their circumstances and income. This is a burden for customers and inefficient for HMRC as well: mistakes can be made or the information can be wrong or submitted too late, meaning the right tax is not collected at the right time and HMRC has to take	Deliver financial reports (e.g. income tax) on time	Provide correct, up-to-date data



					action. This can lead to penalties and interest charges for the customer which could have been avoided. More effective use of third party information, that is, information provided to HMRC by someone other than the customer or their agent, will reduce the reporting burden on customers and reduce errors, making it easier to declare the right tax.		
Making Tax Digital (MTD), UK	Employers	Public and private entities	Data provider	Ensure security and no misuse of data	Digital record keeping software will be linked directly to HMRC systems, allowing customers to send and receive information directly from their software.	Delivery of available data (e.g. wage summaries)	Secure and error-free delivery of data
Making Tax Digital (MTD), UK	Banks	Public and private entities	Data provider	Ensure security and no misuse of data	Digital record keeping software will be linked directly to HMRC systems, allowing customers to send and receive information directly from their software.	Delivery of available data (e.g. interests and tax paid)	Secure and error-free delivery of data
Making Tax Digital (MTD), UK	Building societies	Non-profit entities	Data provider	Ensure security and no misuse of data	Digital record keeping software will be linked directly to HMRC systems, allowing customers to send and receive information directly from their software.	Delivery of available data	Secure and error-free delivery of data
Making Tax Digital	Other Government departments	Public entities	Data provider	Ensure security and no misuse of data	Digital record keeping software will be linked directly to HMRC systems, allowing customers to send and	Delivery of available data	Secure and error-free delivery of data



(MTD), UK					receive information directly from their software.		
Tax data exchange, FR	Tax Authority	Public entity	Database owner, data provider	Ensure security and no misuse of data	N/A	Delivery of available data (e.g. information about the family situation, the number of people living in the household or the tax income)	Provide correct, up-to-date data; ensure secure and error-free delivery of data
Tax data exchange, FR	Citizens	Individuals	Data subject	Ensure security and no misuse of data	Citizens no longer have to give information to the public authorities that is held by the tax authorities if they have signed an agreement.	-	Ensure data privacy and security
Tax data exchange, FR	City of Paris	Public entity	Data consumer	Quick and error-free collection of needed data	They obtain needed info directly from the tax authority hence interaction with the public is no longer needed.	Adhere to security and privacy regulations, handle data as agreed/expected	Secure and error-free delivery of data
Tax data exchange, FR	City of Marseille	Public entity	Data consumer	Quick and error-free collection of needed data	They obtain needed info directly from the tax authority hence interaction with the public is no longer needed.	Adhere to security and privacy regulations, handle data as agreed/expected	Secure and error-free delivery of data
Tax data exchange, FR	City of Lyon	Public entity	Data consumer	Quick and error-free collection of needed data	They obtain needed info directly from the tax authority hence interaction with the public is no	Adhere to security and privacy regulations,	Secure and error-free delivery of data



					longer needed.	handle data as agreed/expected	
Tax data exchange, FR	Ministry of Education	Public entity	Data consumer	Quick and error-free collection of needed data	They obtain needed info directly from the tax authority hence interaction with the public is no longer needed.	Adhere to security and privacy regulations, handle data as agreed/expected	Secure and error-free delivery of data
Electronic tax filling system (e-Tax), EE	The Estonian Tax and Customs Board	Public entity	Database owner, data provider	Timely and error-free collection of financial reports	N/A	Provide a reliable system for financial reporting	Ensure data privacy and security, high-quality data
Electronic tax filling system (e-Tax), EE	Citizens	Individuals	Data subject	Quick and easy declaration of financial reports	The online system with pre-filled forms and 1-click returns has drastically reduced the time spent by individuals and entrepreneurs on filing taxes.	Deliver financial reports (e.g. income tax) on time	Ensure data privacy and security
Electronic tax filling system (e-Tax), EE	Businesses	Private entities	Data subject	Quick and easy declaration of financial reports	The online system with pre-filled forms and 1-click returns has drastically reduced the time spent by individuals and entrepreneurs on filing taxes.	Deliver financial reports (e.g. income tax, VAT) on time	Ensure data privacy and security
Electronic tax filling system (e-Tax), EE	Self-employed	Private entities	Data subject	Quick and easy declaration of financial reports	The online system with pre-filled forms and 1-click returns has drastically reduced the time spent by individuals and entrepreneurs on filing taxes.	Deliver financial reports (e.g. income tax, VAT) on time	Ensure data privacy and security
Electronic tax filling	Various registries: - Population register (RR) (Ministry of the	Public entities	Data provider	Ensure security and no misuse	N/A	Delivery of available data	Secure and error-free



system (e-Tax), EE	<ul style="list-style-type: none"> Interior) <ul style="list-style-type: none"> - Commercial register (ARIREG) (Ministry of Finance) - Excise goods Customs Surveillance Information System (JVIS) - System of detention orders transmission (e-arrest) - The system of electronic standard forms (AITA) - The reporting system of electronic gaming (EHMA) - Information system (MOSS) - Foreign Account tax Compliance Act application (FATCA) - The list of persons of gaming restrictions (HAMPI) - The register of declarations of interests (HDR) - The Control system of import(ICS) - Register of Employment (TÖR) (Ministry of Finance) - The VAT return (KMD) subsystem - The system of permits (LUBA) - Land Tax Information system (MAKIS) - Information system of fiscal stamps (MAIS) - Non-residents register (MRR) 			of data			delivery of data
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8.3.2. Synthesis of taxation-specific stakeholder map

The aforementioned analysis allowed the synthesis of a domain-specific graphical stakeholder map (**Fehler! Verweisquelle konnte nicht gefunden werden.**) depicting the main stakeholders of the taxation domain, the roles they undertake and the interactions among them. The focal point for describing the stakeholders in the taxation domain is the Ministry of Finance / Tax Authority. The Ministry of Finance provides the facilities through which all taxpayers (individuals and legal entities) are obliged to declare annual income. Thus, all natural and legal entities are the data subjects and data recorders of relevant financial data. However, for taxpayers' convenience and avoidance of errors, the Ministry can now collect relevant data that is already available elsewhere and pre-fill the financial forms. Such data are e.g. employees' salary data provided by employers (public and private) and savings' tax paid provided by banks. Thus, public and private bodies act as data providers for the Ministry of Finance and the Ministry acts as data consumer and data aggregator. Finally, the Ministry acts as data provider for various public authorities, e.g. providing data relevant to household, family, or financial situation to Ministries of Interior, Education or Labour for certifying that citizens are entitled to obtain social benefits.

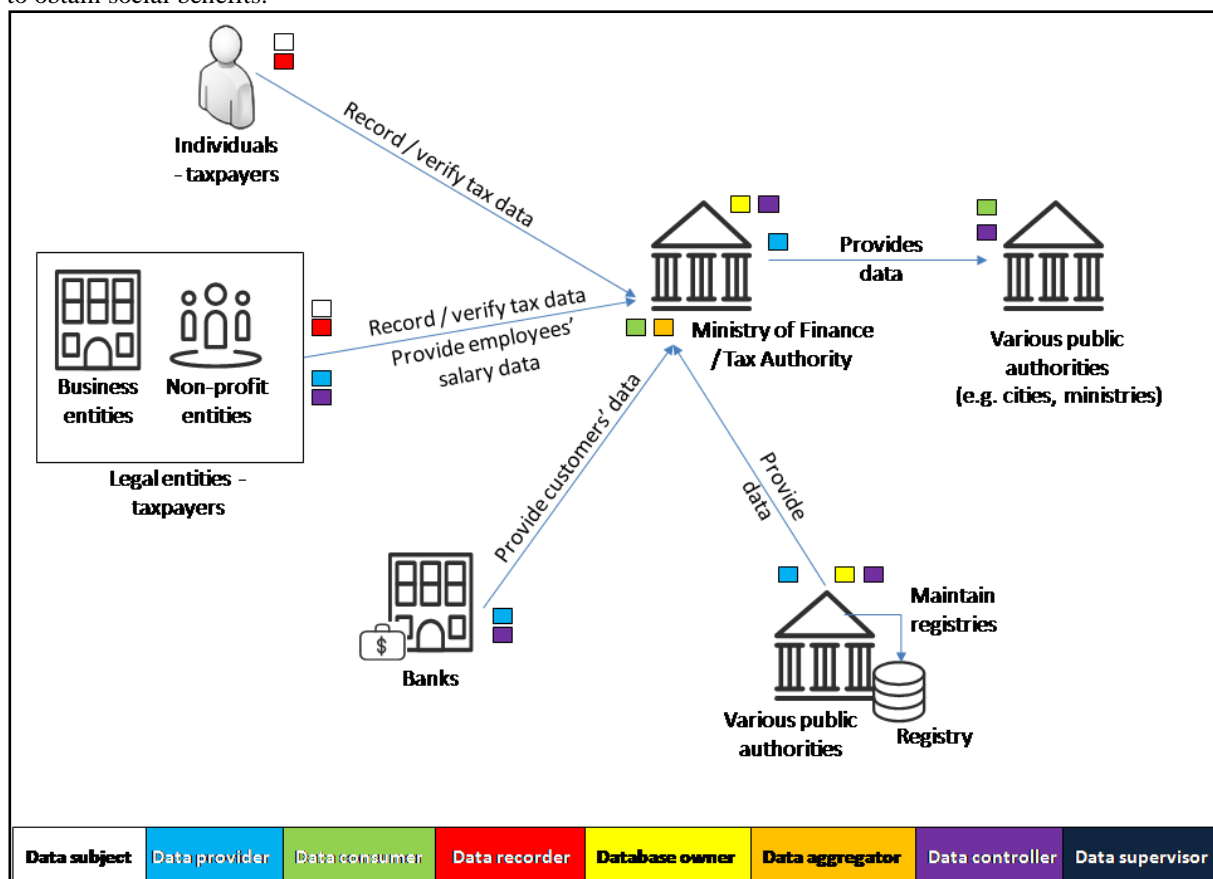


Figure 6: Taxation domain: main OOP stakeholders and interactions



8.4. Social protection

Four cases were examined for developing the stakeholder maps of the social protection domain. The four cases come from four different countries, i.e. Austria, Poland, Estonia and France.

8.4.1. Analysis of stakeholders

Each of the social protection cases contains several stakeholders that have been mapped in .

The analysis showed that all cases have similar stakeholders with comparable characteristics, as they mostly concern a similar application process. The two main stakeholders are the citizens entitled of social protection as the data subjects and the public authorities involved in the welfare processes who mainly act as data providers and data consumers. In the case of parental benefit in Austria, hospitals are also involved as stakeholders. To provide an overview, a graphic (**Fehler! Verweisquelle konnte nicht gefunden werden.**) was created presenting the generic depiction of stakeholders and interactions in the education domain.



Table 11: OOP stakeholders in the Social protection domain (data for Austria, Poland, Estonia and France)

Case	Stakeholder	Type	Role	Key Concerns	Burden reduction	Duties/Obligations
Birth registration and family allowance, AT	Parents	Individuals	Data provider, data consumer	Data privacy and data monitoring	Yes, since parents get family allowance as well as the social security card automatically	go to the Civil Registry Office only once
Birth registration and family allowance, AT	Civil Registry Office	Public entity	Data provider, data consumer	Registering OOP data in a quick and efficient way	Yes, since fewer interactions with other public authorities; e.g. using data from registers	proceed data in registers
Birth registration and family allowance, AT	Social Insurance Agency	Public entity	Data provider, data consumer	High quality data	Yes, since fewer interactions with other public authorities; e.g. using data from registers	Social Security Card
Birth registration and family allowance, AT	Federal Ministry of Finance	Public entity	Database owner, data provider, data consumer	High quality data	Yes, since fewer interactions with other public authorities; e.g. using data from registers	supplying data to authorised consumers in an effective, secure and automated manner; ensuring proper integration of existing distributed databases; improving data quality
Birth registration and family allowance, AT	Hospital	Non profit entity	Data provider	High quality data	No changes	proceed documents to Civil Registry Office
Birth	Federal Ministry of	Public entity	Database owner,	Technology and	Yes, since fewer interactions with	Maintains the interacting registers (ZMR,



registration and family allowance, AT	the Interior		data provider, data consumer	interoperability	other public authorities; e.g. using data from registers	ZPR)
Birth registration and family allowance, AT	Federal Ministry of Families and Youth Affairs	Public entity	Data consumer	Technology and interoperability	Yes, since fewer interactions with other public authorities; e.g. using data from registers	Responsible for the legal aspects of family allowance; Provides the rule catalogue for the acknowledgment of family allowance
Baby bonus (Becikowe), PL	Parents	Individuals	Data provider	data protection, since parents have only the option of online applications	Yes, since parents don't have to show their birth certificate and/or give standard information to the authorities	apply for the baby bonus through an online application
Baby bonus (Becikowe), PL	Ministry of Working Family and Social Policy	Public entity	Database owner, data consumer	Technology and interoperability	Yes, since fewer interactions with other public authorities; e.g. using data from registers	Cross-check the applications with records it already has
Baby bonus (Becikowe), PL	Ministry of administration	Public entity	Database owner	Technology and interoperability	Yes, since fewer interactions with other public authorities; e.g. using data from registers	Maintains the data
Baby bonus (Becikowe), PL	Banks	Public entity/Business	Data provider	Authentication of citizens	No changes	allow citizens to use online banking solutions for authentication and identification for e-government services
Parental benefit, EE	Register of Social Insurance Board (STAR)	Public entity	Database owner, data provider, data consumer	Technology and interoperability	Yes, since fewer interactions with other public authorities; e.g. using data from registers	Officers obtain the data they require from different databases
Parental benefit, EE	Population Register (RR)	Public entity	Data provider	Technology and interoperability	Yes, since the database has the main personal data on Estonian	Check the data, that are already available



					citizens already available	
Parental benefit, EE	Information System of Health Insurance Fund (EHK)	Public entity	Data provider, data consumer	Technology and interoperability	Yes, since the database has the main personal data on Estonian citizens already available	Check the data, that are already available
Parental benefit, EE	IS of Tax & Customs Board (EMTA)	Public entity	Data provider, data consumer	Technology and interoperability	Yes, since fewer interactions with other public authorities; e.g. using data from registers	calculating the parental benefit
Parental benefit, EE	Estonian Education Information System (EHIS)	Public entity	Data provider	Technology and interoperability	Yes, since fewer interactions with other public authorities; e.g. using data from registers	Check the data, that are already available
Parental benefit, EE	Citizens	Individuals	Data provider, data consumer	data privacy	Yes, since citizens doesn't have to give data, which is already known	Submit application at the Social Insurance Board; submit a 'TSM' form regarding the amount of social tax they have paid
Parental benefit, EE	Public administrations (aggregated statistics)	Public entity	Data consumer	Technology and interoperability	Yes, since fewer interactions with other public authorities; e.g. using data from registers	Check the data, that are already available
Application of work welfare – RSA, FR	Citizens	Individuals	Data provider	data privacy	Yes, since citizens doesn't have to give data, which is already known	apply for social welfare online
Application of work welfare – RSA, FR	Caisse d'allocations familiales (CAF)	Public entity	Data consumer	Technology and interoperability	Yes, since administrations exchange data	Get data from citizens; cross-check data from online application
Application of work welfare –	Social Mutualité agricole (MSA)	Public entity	Data consumer	Technology and interoperability	Yes, since administrations exchange data	Get data from citizens; cross-check data from online application



RSA, FR						
Application of work welfare – RSA, FR	Municipality	Public entity	Database owner, data provider, data consumer	Technology and interoperability	Yes, since administrations exchange data	Maintains the interacting registers
Application of work welfare – RSA, FR	Tax authority	Public entity	Data provider, data consumer	High quality data	Yes, since administrations exchange data	calculating the work welfare and proceed it to citizens

8.4.2. Synthesis of social protection-specific stakeholder map

The aforementioned analysis allowed the synthesis of a domain-specific graphical stakeholder map (**Fehler! Verweisquelle konnte nicht gefunden werden.**) depicting the main stakeholders of the social protection domain, the roles they undertake and the interactions among them. The starting point for describing the stakeholders in the social protection domain are the citizens. Citizens are applying through an online application portal or directly to public administrations for parental benefit, family allowance or work welfare. Thus, citizens are the data subjects and potentially the data recorders. Citizens provide their personal data to the public administration only once. The public administrations maintain those data into a base registry. Such public administrations could be the Civil Registry Office, Social Insurance Board, the Caisse d'allocations familiales or the Social Mutualité agricole. Normally, this should be the only interaction between citizens and a public entity during the whole procedure. The base registry can be maintained from different public authorities, such as Ministry of the Interior, Ministry of Working Family and Social Policy or Municipality, who undertake the database owner role. These authorities forward the data from the citizens to the Tax Authority, which then calculates the benefit/work welfare on the income of the citizens. Finally, the data subject gets the benefit/work welfare automatically.

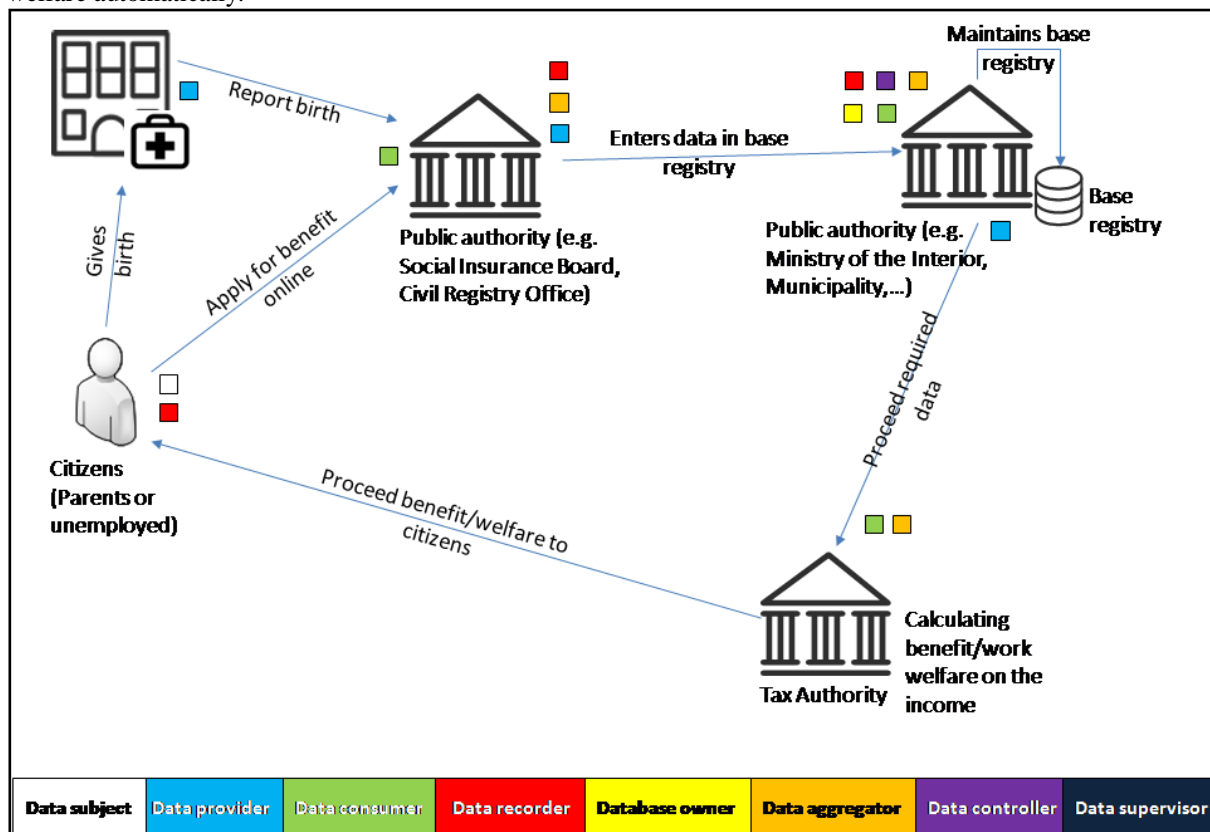


Figure 7: Social protection domain: main OOP stakeholders and interactions



9. Discussion and conclusion

This deliverable aimed at identifying and mapping the stakeholders involved in OOP contexts. This has been performed in a methodological way including theoretical findings through a literature review and empirical findings through analysis of existing OOP cases and discussion of findings with the OOP4C stakeholder community. The results include the definition of OOP stakeholder roles and both generic and domain-specific stakeholder maps.

In subsequent work of WP2, the results of this deliverable are used to analyse stakeholder engagement with the aim of developing a strategic stakeholder engagement plan for successful OOP implementations. This deliverable will also provide background information to WP4 for performing gap analysis and reporting of challenges, needs and benefits of OOP implementations. These activities will be supported by further SCOOP4C stakeholder workshops, which will be organised in collaboration with WP3.

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Annex I: Short description of examined OOP cases

This annex presents a short description of the OOP cases analysed in this deliverable. OOP cases are reported below per country in alphabetical order. Information on the cases has been collected from SCOOP4C project deliverable, D1.2: State of play report of best practices, and from the knowledge base of the SCOOP4C portal.

Austria

Birth registration and family allowance in Austria (Antragslose Familienbeihilfe - ALF) (last view 25/7/2017)

Sector: Birth; nine public services have been integrated so that parents visit only once the Civil Registry Office

Level: National/federal

Connections: personal data are stored in a couple of interacting registers, such as, central civil register (ZPR), central citizenship register (ZSR) and central residence register (ZMR). Within this process the Social Security Card (e-Card) will also be automatically send to the parents. The Social Insurance provides then the Social Security number to the Tax Authority and the Social Security Card (e-card) to the parents of the newborn.

Actors: Apart from the parents, the Civil Registry Office, the Social Insurance Agency, the Tax Authority, i.e. Federal Ministry of Finance, and Federal Ministry of the Interior are involved as data providers and data consumers. Federal Ministry of Families and Youth Affairs is involved as data consumer. In some cases (larger local authorities), registry offices have even subsidiaries in hospitals. Hospitals are also involved as data providers.

Electronic Health Records (ELGA) (last view 26/7/2017)



Sector: Health; simplifies the process of accessing the health records for the patient and the doctors, as well as other health care professionals at hospitals, care facilities and pharmacies.

Level: National/federal

Actors: Patients as data subjects; ELGA GMBH as database owner; Hospitals, doctors, care facilities, pharmacies as data providers and data consumers.

FinanzOnline (FON) (last view 26/7/2017)

Sector: Taxation; facilitates the access to the Austrian tax administration for citizens and businesses as well as for the public administration. Using FinanzOnline, Austrian citizens can, for instance, file their tax return electronically from home. The whole process - from filling in the form to the delivery of the notice is fulfilled electronically.

Level: National/federal

Actors: Taxpayers (citizens and businesses) as data subjects and data recorders, Federal Ministry of Finance as database owner, data provider and data consumer; other public administrations as data provider and data consumer.

Estonia

Digital Prescription (last view 28/7/2017)

Sector: Health; makes access available to all prescriptions prescribed in Estonia – there is no need to go visit the family doctor any more to get a new prescription. The doctor can see from the system what has been the diagnosis and what has been the medication the patient has been earlier prescribed. It is enough to call or sms the doctor to say that new prescription is needed and just to go with the ID-card to any pharmacy in Estonia and buy the respective drug.

Level: National/federal

Connections: The Prescription Centre, a centralized database, is linked to the Health Information System (EHR), Estonian Insurance Fund and different Health Care Providers.

Actors: Citizens (patients) as data subjects and data consumers (seeing their prescriptions); the Estonian Health Insurance Foundation as database owner of the Prescription Centre; the Health Information System (TEHIK) by the Ministry of Social Affairs as data provider and consumer; Population Register, Business Register, Address Data System, Medicines Coding Centre – ATC code and Medicines (State Agency of Medicine), Register of Handlers of medicines – Licences of Pharmacies and pharmacists (State Agency of Medicine), Medical devices Registry (Health Care Board), Health Insurance Status Register (Health Insurance Foundation), Health care providers Register (Health care Board), Health professionals Register (Health care Board), State Information Board as data providers; Health care providers (GP, hospitals, emergency services, dentists, nurses) through HIS X-Road MISP – Portal for GP and HIS X-Road MISP – portal for Emergency Mobile Stations, pharmacists through HIS X-Road MISP – Portal for Pharmacies as data providers and consumers.

Doctor-doctor-consultation (last view 28/7/2017)

Sector: Health; digital doctor-doctor consultation (not doctor-patient) to instantly specify whether the patient may or may not need to visit a specialist doctor

Level: National/federal

Actors: Citizens (patients) as data subjects; Ministry of Social Affairs as database owner (of Health Information System services – e-consultation (TEHIK)), data provider and data consumer; Population Register, Business Register, Address Data System, Health Insurance Status Register (Health Insurance Foundation), Health care providers Register (Health care Board), Health professionals Register (Health care Board), and State Information



Board (X-road, eID, Mobile-ID, ID-card) as data providers; Health Care providers (GP, Hospital, specialists) HIS X-Road MISP – Portal for GP as data providers and consumers.

Estonian Central Health Information System (EHR) (last view 28/7/2017)

Sector: Health; holds data about visit, anamnesis, diagnoses, treatment, examinations and recommendations which are visible to all clinicians who treat patients

Level: National/federal

Actors: Citizens (patients) as data subjects and data consumers (via www.eesti.ee or www.digilugu.ee); Ministry of Social Affairs as database owner (of Health Information System (TEHIK)); Population Register, Business Register, Address Data System, Medicines Coding Centre (State Agency of Medicine), Register of Handlers of medicines – Licences of Pharmacies and pharmacists (State Agency of Medicine), Health Insurance Status Register (Health Insurance Foundation), Health care providers Register (Health care Board), Health professionals Register (Health care Board), Prescription Centre (Health Insurance Foundation), Medical Images Repository, State Information Board (X-road, eID, Mobile-ID, ID-card) as data providers; Health Care providers (GP, Hospital, Emergency service, Dentists IS), HIS X-Road MISP – Portal for GP, HIS X-Road MISP – portal for Emergency Mobile Stations as data providers and consumers; Universities, Scientists, Statistics Portal, Road Administration Board, Social Security Board, Health Insurance Foundation, Medical Registries (Cancer Register) – National Health Development Institute, Medical Registries (Infection Diseases register) – Health Care Board as data consumers.

Medical Certificate (last view 28/7/2017)

Sector: Health & Transport; In order to obtain an e-medical certificate, you must fill in a medical declaration online at the National Health Information System regarding your health and then make an appointment with a doctor who issues an e-medical certificate that is automatically transmitted to the motor registry.

Level: National/federal

Actors: Citizens (drivers) as data subjects and data consumers (www.digilugu.ee); Ministry of Social Affairs as database owner (of Health Information System services - certificates (TEHIK)); Population Register, Business Register, Health care providers Register (Health care Board), Health professionals Register (Health care Board), State Information Board (X-road, eID, Mobile-ID, ID-card) as data providers; Health Care providers (GP, Hospital, Emergency service, Dentists IS), HIS X-Road MISP – Portal for GP, Patient Portal as data providers and data consumers, Road administration/Motor registry as data consumer.

Medical Digital Image Bank (last view 28/7/2017)

Sector: Health; it is a central database that stores all the radiological images and films, it gives the possibility to have the second opinion without making new images (and radiation) and the doctors can consult each other without additional research and patient movement

Level: National/federal

Actors: Citizens (patients) as data subjects; Medical Images Foundation as database owner of Medical Digital Images Bank (PACS Repository) and Ministry of Social Affairs as database owner of Health Information System (TEHIK); Population Register, Business Register, Health care providers Register (Health care Board), Health professionals Register (Health care Board), State Information Board (eID, Mobile-ID, ID-card) as data providers; Health Care providers (GP, Hospital, Dentists), HIS X-Road MISP – Portal for GP as data providers and data consumers.

Sisseastumise InfoSüsteem (SAIS) (last view 6/7/2017)



Sector: Education; electronic management of the process of submitting applications to educational institutions (universities and colleges). The citizens of Estonia can submit required documentation through the system and educational institutions can manage the information and data of candidates in a systemic way.

Level: International; used also for foreign students

Actors: Citizens (applicants) as data subjects, data recorders and data consumers; Ministry of Education and Research as database owner; Officials of Universities as database owners, data providers and data consumers; The Information Technology Foundation for Education (HITSA) as database owner; Estonian Education Information System (EHIS), Population register (RR), Examination Information System (EIS) as data provider; The study information system in universities and colleges (ÕIS), System for applicants from abroad (VVIS), Ministry of Education, all universities as data consumers.

Register of Employment (last view 21/7/2017)

Sector: Employment; Start, suspension and termination of employment is listed in the employment register and many public authorities get this data directly from the register.

Level: National/Federal

Actors: Employees as data subjects, employers as data recorders, Tax and Customs Board as database owner and data consumer, other linked registers are the Population Registry, Address System, Business Register and the Register for Agencies of State and Municipalities. Estonian Health Insurance Fund, Estonian Unemployment Insurance Fund, Estonian Labour Inspectorate, Social Insurance Board and Police and Border Guard Board as data consumers.

E-Census (last view 27/7/2017)

Sector: Citizenship; people take an active part in census by answering the questions of an enumerator or by filling in an e-census questionnaire. Estonia is now conducting a register based census. The census data will be compiled from the data of national registers. About 24 national registers will be included, and they involve data on many fields of life.

Level: National/Federal

Actors: Citizens as data subjects; the Estonian Board of Statistics as database owner of the e-Census database; Population Register (RR) (Ministry of the Interior), Business Register (ARIREG) (Ministry of Finance), Address Data System (ADS) Land Board, Register of Residence and Work Permits (ETR). Ministry of the Interior, Register of prisoners, post-sentence prisoners, detainees and arrested peoples (KIR). Ministry of the Interior, Estonian Education Information System (EHIS), Register of taxable persons (EMTA). Ministry of Finance, Register of Employment (TÕR). Ministry of Finance, Register of Mandatory Funded Pension (KPR). Ministry of Finance, The State Human Resources Database (SAP). Ministry of Finance, Estonian Register of Buildings (EHR). Ministry of Economic Affairs and Communications, Land Register (KR). Ministry of Finance, State Register of State and Local Government Institutions (RKOARR) Ministry of Finance, E-file system (E-Toimik). Ministry of Finance, Social Services and Benefits Registry (STAR). Ministry of Social Affairs, Social Security Information System (SKAIS). Ministry of Social Affairs, Health Insurance Information System (KIRST). Estonian Health Insurance Fund., National Defence Obligation Register (KVKR). Ministry of Defence., Estonian Unemployment Information System (EMPIS). Estonian Unemployment Insurance Fund, Estonian Traffic Register (liiklusregister). Estonian Road Administration, Population and Housing Census (REL) (previous data). Board of Statistics Estonia as data providers; public administrations as data consumers of statistics.

e-PRIA (last view 27/7/2017)

Sector: Agriculture; e-PRIA is the client portal of the Agricultural Registers and Information Board, through which clients can submit documents to ARIB and check their details in ARIB's registers. Keepers can use the portal to submit a variety of declarations and also check registry data.



Level: National/Federal

Actors: Farmers/agriculture businesses as data subjects and data recorders; Agricultural Registers and Information Board (ARIB) of the Ministry of Rural Affairs as database owner; Population Register, Business register, Address system, Register of agricultural support and agricultural parcels, Administration System of School Milk Subsidy, Rural development aid system, Rural development support administration system, Client register of ARIB, Estonian Agricultural Geographical Information System (EAGIS), Administration System of National Subsidies, Veterinary and Food administration as data providers.

E-file system (last view 27/7/2017)

Sector: Law; an online information system which allows procedural parties and their representatives to electronically submit procedural documents to courts and to observe the progress of the proceedings related to them. For example, a single parent can apply for alimony without making a trip to the court house.

Level: National/Federal

Actors: Citizens as data subjects, data recorders and data consumers; The Ministry of Justice as database owner; Population Register, System of address data and Register of taxable persons as data providers.

The electronic tax filing system (e-Tax) (last view 27/7/2017)

Sector: Taxation; the taxpayer logs onto the system, reviews their data in pre-filled forms, makes any necessary changes, and approves the document with a digital signature.

Level: National/Federal

Actors: Taxpayers as data subjects, data recorders and data consumers; Population register, Commercial register, Excise goods Customs Surveillance Information System (JVIS), System of detention orders transmission (e-arrest), System of electronic standard forms (AITA), The reporting system of electronic gaming (EHMA), Information system MOSS, Foreign Account Tax Compliance Act application (FATCA), The list of persons of gaming restrictions (HAMPI), The register of declarations of interests (HDR), The Control system of import (ICS), Register of State and Local Governments, The VAT return (KMD) subsystem, The system of permits (LUBA), Land Tax Information system (MAKIS), Information system of fiscal stamps (MAIS), Non-residents register (MRR), Register of taxable persons (EMTA), Register of Employment (TÖR) as data providers.

Parental Benefit (last view 27/7/2017)

Sector: Social; Citizen can apply for the parental benefit via the State Portal or at a regional bureau of the Social Insurance Board. Social Insurance Board officer obtain the data they require from different databases.

Level: National/Federal

Actors: Parents as data subjects and data recorders; Social Insurance Board as database owner of the Register of Social Insurance Board (STAR); Population Register (RR) and Estonian Education Information System (EHIS) as data providers; Information System of Health Insurance Fund (EHK), IS of Tax & Customs Board (EMTA) as data providers and data consumers; public administrations as data consumers.

E-Notary (last view 27/7/2017)

Sector: Law; an online environment, which helps notaries in their everyday work and allows electronic communication between notaries and the state. The system allows making queries to 16 different registries (for example the Marital Property Register, the Official Announcements, the Estonian Central Registry of Securities, the Register of Constructions, the Land Register, the Traffic Registry, the Land Cadastre, the Succession Register, the Population Register, the Registry of Recreational Craft, the Business Register). The e-Notary programme can only be used by notaries and notary office employees.

Level: National/Federal



Actors: Citizens and businesses as data subjects; the system is owned by the Chamber of Notaries and the servers are administrated by the Centre of Registers and Information Systems; Migration Register, Building Register, Monuments Register, Register of founded Pensions, Estonian Central Register of Securities, Consolidated List of Terrorist, Small Ship Register, Traffic register, Register of Marriage Contracts, Population Register, Register of State and Local Governments, European Network of Registers of Wills as data providers; Commercial Register, Land Register, Succession Register, Register of Official Announcements, Land Cadastre as data providers and data consumers.

Estonian Education Information System (EHIS) (last view 27/7/2017)

Sector: Education; a state register which unites the databases of the education system into one entity. EHIS creates the possibility for everyone to inspect the performance indicators of preschool child care institutions, basic schools, upper secondary schools and vocational educational institutions.

Level: National/Federal

Actors: Citizens as data subjects and data consumers; Ministry of Education and Research as database owner, data provider and data consumer; Register of Professions, Population Register, Examination Information System, Address Data System, Punishment Records Register, Register of taxable persons, Register of Business as data providers; public administration as data consumer.

France

Application of work welfare – RSA (last view 26/7/2017)

Sector: Unemployment; RSA is the French work welfare program. It gives the unemployed a minimum income and shall encourage them to find work or is supporting low-wage workers by their income. To apply for this program, individuals have to fill out a form and to hand it to a relevant administration - and their physical attendance is obligatory. This process is highly complex and thus citizens sometimes don't apply for RSA. In the future the process will be highly simplified. Citizens can fulfil all the administrative processes which are needed online, and they don't have to hand in personal documents if they have given them once to any French administration.

Level: National/Federal

Actors: N/A

Application for a parking vignette (last view 26/7/2017)

Sector: Transport; citizens can apply for the vignette online without handing in any documents concerning domicile, income or car registration. This information will be exchanged between the administrative bodies of the cities.

Level: National/Federal

Actors: N/A

Electronic tax filing system (last view 26/7/2017)

Sector: Taxation; The contact with French government organizations or municipalities gives a lot of burden for French citizens as they have to fill out the same forms and hand in the same documents to the tax authorities over and over again. Citizens don't have to hand in certain documents at the tax authorities or any other authority again. The concerned data are the family situation, the number of dependents, the reference tax income and the number of shares in the household. The programm will start in the cities Paris, Lyon and Marseille, who have information about the family income and situation and information the National Education, Higher Education and Research who have data about scholarships in schools.

Level: National/Federal



Actors: N/A

Greece

Citizens' Registry (last view 21/7/2017)

Sector: Citizenship; Development of a base registry hosting citizens' civil and municipal status information. Authorized users of the Ministry of Interior and municipalities, will have rights to register, search, update/edit, monitor and print any kind of civil and municipal status information, while certified public-sector organisations will have automated access to the database of the Citizens' Registry.

Level: National/Federal

Actors: Citizens as data subjects, Ministry of Interior as data provider and central database owner, municipalities as data providers and consumers, other public authorities as data consumers.

TAXIS (last view 25/7/2017)

Sector: Taxation; it is the integrated information system of the Hellenic tax system. TAXIS promotes OOP as it offers a lot of pre-filled forms. It acquires citizen data, such as salary details, from other information systems. Furthermore, it provides data to other governmental informational systems through web-services that have been installed to the Interoperability Centre of the Ministry of Finance.

Level: National/Federal

Actors: Citizens and legal entities as data subjects and data recorders, Ministry of Finance as database owner, data provider and data consumer, other public authorities and information systems as data providers and data consumers.

Ireland

Government Portal (last view 26/7/2017)

Sector: eGov services; enables the public and businesses to easily find and access online public services, to register for transactions as well as targeted information and to ultimately be able to provide information to Government on a 'once-only' basis, using the existing MyGovID facility. MyGovID allows public and businesses to authenticate themselves through an identification process and use the information they have already provided to save them the inconvenience of repeated re-keying in the future.

Level: National/federal

Actors: Citizens and businesses as data subjects data providers and data consumers; Department of Public Expenditure and Reform as database owner; Citizens Information Board, Irish Government News Service and 16 different government departments as data providers.

Central Applications Office (CAO) (last view 26/7/2017)

Sector: Education; centrally processing applications for admissions to first year undergraduate courses of higher education institutions in Ireland. The participating institutions retain the function of making decisions on admissions. This service reduces administrative burden on citizen by providing central application process instead of several direct applications to different universities and colleges.

Level: National/federal

Actors: Applicants as data subjects and data recorders, CAO as the database owner, Irish Higher Education Institutions (HEIs) as data providers and data consumers.

Poland

Baby bonus (Becikowe) (last view 25/7/2017)



Sector: Birth; Parents shall no longer be required to show their birth certificate and or to give standard information to the authorities when they apply for baby financial support. They will just have to apply online and the government will complete and cross-check the applications with records it already has.

Level: National/federal

Actors: Parents as data subjects; Ministry of Working Family and Social Policy and Ministry of administration as database owners; Ministry of Working Family and Social Policy as data consumer; employers and banks as data providers.

Spain

Interoperability node of the Spanish University System (NISUE) (last view 25/7/2017)

Sector: Education; NISUE has been developed for the electronic interchange of academic data among Spanish universities as well as between national and European organizations that use academic data in order to provide better electronic services. Example of a Use Case: transfer of academic records; to facilitate the mobility of students, universities need to share files or academic research data.

Level: National/federal

Actors: Students as data subjects; The Conference of Principals of Spanish Universities (CRUE), RedIRIS (the spanish academic and research network), MINHAP (Ministry of Finance and Public Administration of the national government) as database owners, data providers and data consumers; academics as data providers and data consumers.

The Netherlands

Studielink (last view 6/7/2017)

Sector: Education; Electronic registration and enrolment for all non-private institutions of higher education. Applicants can use Studielink to submit a digital enrolment application to an educational institution. Students can enter and check information which they can then access and use whenever they need it. This also applies for all bodies involved in the enrolment process, including universities of applied sciences, universities and DUO (Dients Uitvoering Onderwijs - Education Executive Agency/Ministry of Education).

Level: National/federal

Actors: Citizens (applicants) as data subjects, data providers and data consumers, universities and other educational organisations as well as the Ministry of Education (DUO) act as database owners, data providers and data consumers.

The United Kingdom

Universities and Colleges Admissions System (UCAS) (last view 20/7/2017)

Sector: Education; instead of five different application processes, students can apply for up to five universities by just one application at UCAS

Level: National/federal

Actors: Citizens (applicants) as data recorders and data consumers, UCAS organisation (charity, non-governmental organisation) acts as database owner and data provider, private and public universities act as data providers and data consumers

Tell Us Once Program (TUO) (last view 20/7/2017)

Sector: Birth, Death; inform government just once of a birth or death.

Level: National/federal



Connections: It takes place in 44 local authorities for 24 services such as the Council Housing service or the Passport service.

Actors: Citizens (parents, family members) as data providers through the online system; Department for Work and Pensions (DWP) as database owner; DWP, HM Passport Office, HM Revenue and Customs (HMRC), Driver and Vehicle Licensing Agency (DVLA), local councils, Armed forces pension schemes as data consumers.

Making Tax Digital (MTD) (last view 25/7/2017)

Sector: Taxation; individuals will not have to give HM Revenues and Customs (HMRC) information that it already has, or that it is able to get from elsewhere - for instance from employers, banks, building societies and other government departments

Level: National/federal

Actors: Taxpayer as data subject, data recorder and data consumer, HM Revenues and Customs as database owner and data consumer, Employers, banks, building societies and other governmental departments as data providers.

Annex II: Glossary of key terms

Data aggregator is defined as any entity that is liable for integrating/aggregating OOP data from/to different databases, formats, etc.

Data consumer is defined as any natural or legal entity that uses data about a data subject to complete an administrative procedure, deliver a service or make a decision.

Data controller is defined as any natural or legal entity that is liable for determining the purposes and means of the processing of personal data, ensuring the quality and security of OOP data, and notifying the processing operation to the data supervisor.

Data processor is defined as any natural or legal entity that processes personal data on behalf of (and subject to instruction by) the data controller.

Data provider is defined as any natural or legal entity who holds data about data subjects and makes these data available to data consumers.

Data recorder is defined as any entity that registers/ updates the data of the data subject.

Data subject is defined as an identifiable natural or legal person to whom the data, which are collected, held or processed in OOP contexts, pertains. Data subjects are to be given access to view data (and usage of such data) that are relevant to themselves and/or other information relevant to OOP data usage.

Data supervisor is defined as an independent public authority that is responsible for monitoring and enforcing the application of MS and EU regulations on data protection.

Database owner is defined as any entity that controls, governs and/or is liable for the operation of a database that maintains data that can be reused and shared in OOP contexts.

OOP stakeholder is any natural or legal entity who will be affected by or can affect the implementation of OOP.