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Roadmap for future areas of actions, and policy recommendations (D 4.2)

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Abstract:	This deliverable documents the activities carried out in task 4.3 and the findings generated thereby, i.e. the roadmap for future areas of actions as well as policy recommendations. Eleven areas of actions were identified based on the gap analysis (cf. D 4.1) and a comprehensive set of actions and measures were suggested in each policy domain selected with the aim of enhancing the implementation of the OOP across borders. Corresponding stakeholder groups for implementation of suggested actions and measures were specified. Actions and measures were grouped according to their responsible stakeholder groups. Moreover, this report includes the policy recommendations SCOOP4C brings forward to boost the implementation of the OOP in Europe.

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HISTORY OF DOCUMENT

Version	Date	Status of work / Description of updates	Contributors
1.0	07/06/2019	Final version submitted to the EC	UKL
1.1	07/10/2019	Small updates implemented after the final review (e.g. corrections of broken links) based on the reviewer comments	UKL
1.2	07/11/2019	Final amendments after reviewer's feedback to fix the bug on the web page to filter the gap table, the roadmap actions table and the policy recommendations table.	UKL

ABBREVIATIONS AND ACRONYMS

Abbreviation	Description
CERTH	Centre for Research and Technology Hellas, Greece
DSMS	Digital Single Market Strategy
EC	European Commission
EGA	E-Riigi Akadeemia Sihtasutus E-Governance Academy EGA, Estonia
EIS	European Interoperability Strategy
INIT	INIT Aktiengesellschaft für Digitale Kommunikation-Init AG, Germany
IT-K	IT-Kommunal GmbH, Austria
OOP	Once-only principle
OOP4C	Once-only principle for citizens
SCOOP4C	Stakeholder Community: Once-Only Principle for Citizens
UKL	University of Koblenz-Landau, Germany
WP	Work Package

Executive Summary

This deliverable reports the findings and results of work performed under tasks 4.3 and 4.4 of work package 4: Gap analysis and roadmap for future areas of actions, aiming at developing a roadmap of future areas of actions and policy recommendations for policy makers, funding bodies and implementers of OOP solutions in order to reach the full potential of the OOP4C vision in OOP public services for citizens.

The formulation of the roadmap actions is based on the findings from synthesis of barriers, challenges and needs as well as benefits of widely implementing and diffusing the OOP in public service provisioning as carried out in tasks 4.1 and 4.2 and documented in deliverable D 4.1. The methodology for the overall approach in work package 4 is customised from roadmapping approaches applied in earlier projects such as eGovRTD2020 and CROSSROADS. A number of stakeholder workshops have been conducted to deliberate with the participants the entries in the roadmap as well as policy recommendations for effective OOP implementation in cross-border settings in the five domains selected in D 4.1 (education, health, moving, social protection and taxation).

The major results reported in this deliverable are

a) the actions and measures identified and described in eleven relevant areas of action. These eleven areas are motivation for OOP, political commitment, legal interoperability, organisational interoperability, semantic interoperability, technical interoperability, interoperability governance, citizen-centred design, data quality, data protection, and trust and transparency. These areas of action are first described together with exiting gaps, followed by the recommended actions.

b) the policy recommendations, which are also raised along ten roadmap areas and which are directed towards key target actors, namely EU level and national policy and law makers. The report also sums up main findings gathered through an online questionnaire.

The deliverable closes with conclusions on the work performed and achievements in work package 4.

1. INTRODUCTION

The once-only principle is among the seven driving principles in the eGovernment Action Plan 2016-2020 of the European Commission (EC)[1]. To boost developments towards administrative burden reduction and simplification of procedures, two projects are funded by the EC in its Horizon 2020 programme[2] to investigate once-only principle implementations: SCOOP4C[3] and TOOP[4].

SCOOP4C investigates, discusses and disseminates how the once-only principle (OOP) can be implemented in contexts of co-creation and co-production of public services for citizens to contribute to significantly reduce administrative burden and simplify administrative procedures for citizens while reusing data among public administration with the control and consent of citizens. Successful implementation of the OOP shall strengthen economic growth, therewith contributing to implement the strategic objectives of the Digital Single Market[5] as well as the eGovernment Action Plan 2016-2020 of the European Commission.

SCOOP4C has the following objectives:

- to build up and sustain a stakeholder community for the once-only principle for citizens in order to discuss and share experiences as well as drivers, enablers and barriers

- to identify, collect and share existing good practices of once-only implementations for citizens across Europe and to establish a body of knowledge about the cases

- to discuss challenges, needs and benefits of widely implementing and diffusing the once-only principle in co-creation and co-production contexts involving citizens and governments as data producers and data consumers

- to draw conclusions from comparing existing best practices with needs and challenges, including policy recommendations towards a necessary paradigm change in the public sector and of the citizens to build up trust on data shared among governments while no longer bothering citizens to repeatedly provide the same data in public service provisioning

- to identify relevant stakeholders and to develop a strategic stakeholder engagement plan to ensure sustainable implementations of the once-only principle with a large engagement of stakeholders in various co-creative and co-productive public service provisioning contexts

- to develop a tangible roadmap of future areas of actions to implement, diffuse and sustain concepts and implementations of once-only solutions for citizens

This deliverable documents the findings of tasks 4.3 and 4.4 that were carried out in work package 4. Task 4.3 aimed at developing a roadmap of future areas of actions to guide policy makers as well as implementers and funding bodies of how to best implement the once-only principle (see chapter 3). The main objective of this roadmap was to spread the maximum potential the OOP4C vision. The roadmap was developed based on the results gathered in tasks 4.1 and 4.2 of the work package 4, which are documented in the gap analysis report (see deliverable D 4.1[6]). Identified gaps in the previous deliverable were classified in various types such as political commitment, technical interoperability, and trust and transparency. The eleven most pressing among the identified gaps in the different domains were evaluated as the areas of actions. For each area, a number of actions and measures were suggested to overcome the existing gaps and to enhance the OOP implementation in the cross-border cooperation between citizens and public sector. The recommended actions were extracted from productive collaborations between the project partners, the SCOOP4C community, and a broad group of relevant stakeholders. Based on previous EC projects, an interactive methodology was designed to develop the roadmap of future areas

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[1] https://ec.europa.eu/digital-single-market/en/european-egovernment-action-plan-2016-2020

[2] http://ec.europa.eu/programmes/horizon2020/node/85

[3] www.scoop4c.eu

[4] www.toop.eu

[5] http://ec.europa.eu/priorities/digital-single-market_en

[6] Deliverable D4.1: Gap analysis report of the challenges, needs and benefits of the OOP4C analysis, 2019, SCOOP4C Consortium, https://scoop4c.eu/sites/default/files/2019-06/SCOOP4C_D4.1_v1.1.pdf

of actions. One of the main objectives of this method is to facilitate fruitful participation of a variety of stakeholders during the development of the roadmap. The methodologies applied in the roadmapping exercise are described in chapter 2. Moreover, responsible actors were defined for each suggested action. The specified actors are expected to support the successful implementation of the OOP by accomplishing the recommended actions. Furthermore, the suggested actions in each area were grouped by topical areas. The roadmap was verified by the steering board member of the SCOOP4C project on the 25th September 2018 in Vienna, Austria after the final stakeholder session in the scope of the second conference of the project, which was successfully accomplished on the 24th September, as well, in Vienna.

Task 4.4 aimed to develop policy recommendations for policy makers in both, national and EU levels, targeting also OOP implementers, funding bodies, and other relevant actors with the aim of including the once-only principle in high-level policies and in modernisation of the public administration (see chapter 4). The policy recommendations were finally designed in form of a policy brief toward policy makers and other relevant stakeholders to convert the services of the public sector into once-only and digital by default solutions (see deliverable D 4.3[7] of WP4).

The deliverable at hand is structured as follows: Chapter 2 documents the research design and methodology; in two subchapters, the methodologies of roadmapping as well as different approaches for the interaction with various stakeholders are outlined. Chapter 3 illustrates the future areas of actions on research and innovation. Identified areas of actions were classified in eleven categories. Subsequently, each area of action was characterised to indicate the importance of the area of action for the accurate implementation of the OOP. Likewise, the current situation and the existing gaps were indicated along the corresponding area into a tabular overview over the suggested actions and measures. The policy recommendations to relevant actors is presented in chapter 4, including findings from the online questionnaire. Chapter 5 sums up the key findings and achievements of tasks 4.3 and 4.4, and concludes the work package 4.

The content of the deliverable can also be found on the project website in a more accessible and user friendly form, including comprehensive tables of gaps, roadmap actions and policy recommendations, which can be filtered along specific aspects – see https://scoop4c.eu/node/527 (go to tab 'knowledge' and then select 'Roadmap and Recommendations' as sub-tab).

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[7] Deliverable 4.3: Policy brief of recommendations, 2019, SCOOP4C Consortium, https://scoop4c.eu/sites/default/files/2019-06/SCOOP4C_D4.3.pdf

2. RESEARCH DESIGN FOR THE ROADMAP DEVELOPMENT

The work in this deliverable was accomplished based on the identified gaps in D 4.1 and through intense interaction with the stakeholder community. An interactive methodology was applied to develop a comprehensive set of actions and measures with the aim to enhance the cross-border implementation of the OOP. The roadmapping methodologies used in previous EC projects, such as the eGovRTD2020 (Codagnone C. , 2007) (Ma & Wimmer, 2007), CROSSROAD (Lampathaki, et al., 2010) and eGovPoliNet (Wimmer & Majstorovic, 2015) as well as the methodology applied in A Digital Georgia project (Krabina, et al., 2013) were combined and customised according to the particular needs and requirements of the SCOOP4C project. This roadmapping methodology as customised for SCOOP4C is described in section 2.1. Subsequently, the interactive techniques that were applied to facilitate a fruitful contribution of relevant stakeholders are outlined in section 2.2.

2.1. Roadmapping Method

The deliverables in work package 4 were conducted in close collaboration with the SCOOP4C community and this approach is continued within the roadmapping task. The interaction with the stakeholders is key for the development of the roadmap.

The roadmap builds on three core constructs: the current situation, the desired situation, and the steps to get from the current to the desired situation (i.e. the roadmap actions). The first construct is described by the state of play and is represented by the body of knowledge developed in D 1.2[8]. The second construct emerges from the vision formulated at the beginning of the project (cf. D 1.1[9]) as well as the future once-only scenarios and the gap analysis developed in the deliverable D 4.1. Based on these insights and an intensive interaction with stakeholders the final construct forms the roadmap with its recommended actions to successfully implement the OOP.

Different to the previous research-oriented roadmaps, the SCOOP4C roadmap recommends future actions to enhance the implementation and use of the once-only principle. The actions address different areas as well as involved stakeholders, pertaining to the future scenarios from D 4.1 and therewith aiming at overcoming identified gaps identified in that deliverable.

To structure the roadmapping approach and provide a coherent research method, Figure 1 depicts the research design chosen. As mentioned before, the first step in the approach was to elaborate preliminary roadmap actions by the project team, mainly by the lead partner of the work package, and by the lead partners responsible for an individual scenario outlined in D 4.1. The roadmap actions were then, in a number of iterations, discussed among the project partners and these were exposed to OOP stakeholders from different sectors (civil, private, public, …) in several workshops (see section 2.2.1). The workshops were conducted in cooperation with work package 3 and work package 2 regarding the stakeholder engagement (see more detailed information on the workshops documented in D 2.2 and D 3.3). The aim of the workshops was to confirm the actions and grouping of actions into the areas or to suggest new actions to overcome the gaps. After each workshop, the findings were consolidated and integrated into the collected roadmap activities and these were reviewed by project partners in order to introduce revised roadmap actions for the next stakeholder workshop.

Along the final OOP conference in Vienna (September 2018), the consolidated roadmap of actions was exposed to the participants of the conference (OOP stakeholders) and to the Steering Board Members of SCOOP4C. The input gathered has led to final revisions in the roadmap of actions, and to review and revisions of the policy recommendations. Further workshops were conducted to confirm the actions in the roadmap and to revise the policy recommendations.

Finally, online questionnaires were developed (see section 2.2.3) and implemented to gather inputs on the policy recommendations in the five different domains of the scenarios.

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[8] Deliverable D 1.2: State of play report of best practices, 2017, SCOOP4C Consortium, https://scoop4c.eu/sites/default/files/2018-01/SCOOP4C_D1.2.pdf

[9] Deliverable D 1.1: Vision of the once-only principle for citizens, including key enablers and major barriers 2017, SCOOP4C Consortium, https://scoop4c.eu/sites/default/files/2018-01/SCOOP4C_D1.1.pdf
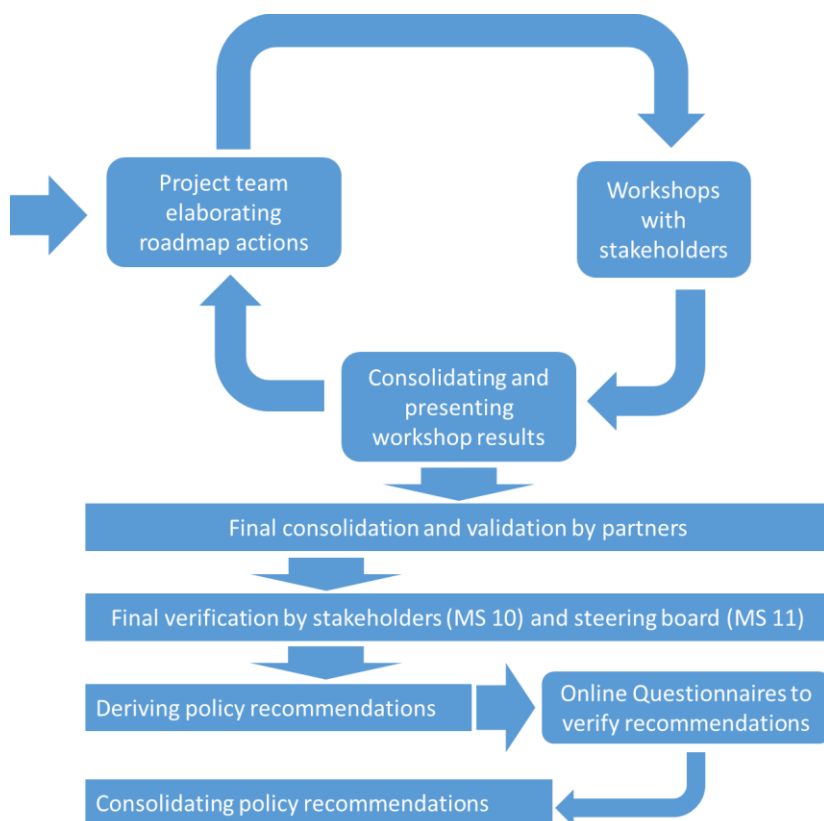
Figure 1: SCOOP4C methodology for roadmapping and policy recommendations

2.2. Interaction with stakeholders

The interaction with the stakeholder in the SCOOP4C community and broader stakeholder groups during the process of roadmapping included face-to-face interactions via interactive workshops and the online questionnaires. Both means are outlined in the subsequent sections.

2.2.1. Workshops

To achieve a fruitful dialogue supporting the roadmap development, a set of interactive workshops were carried out in different member states to ease the interaction with relevant stakeholders by face-to-face discussions. The workshops included similar session structures as following:

- A short presentation to familiarise the participants to the general concepts of the OOP as well as the SCOOP4C project;
- Short presentations with the aim of introducing participants to the identified areas of actions for the implementation of the OOP (promote the identified issues and barriers in a specific area of action in topic specific workshop);
- An interactive session for the supplementary study of issues as well as possible actions and measures to overcome identified barriers;

In the interactive sessions of these workshops, the tasks were similarly structured into the following steps:

- Stakeholders had to choose a scenario of interest (if possible w/ equal distribution of people)
- A Scenario Master introduced to the scenario and to identified gaps (max. 5 minutes)
- The groups discussed the following topics (ca. 40 – 60 minutes)

       o   Identification and outlining of actions for the roadmap to overcome the gaps when implementing the OOP and defining who should be responsible for implementing the actions

       o   Derive policy recommendations for policy makers to boost the implementation of the OOP across Europe

- Last step was to report back the findings / insights in the plenary and to discuss these with other stakeholders from different groups (max 10 mins per group)

The interactive sessions and the above tasks were explained along an introductory presentation using slides as shown in Figure 2 and Figure 3. Figure 4 demonstrates that the stakeholders were exposed to different scenarios in the workshops. Depending on the size of the participants, all or a smaller set of prepared scenarios could be selected by participants.

Figure 2: Explaining the means and process of interactive sessions in SCOOP4C workshops to define actions for the roadmap (1)

Figure 3: Explaining the means and process of interactive sessions in SCOOP4C workshops to define actions for the roadmap (2)

Figure 4: Selection of groups based on scenarios varying among SCOOP4C workshops

The means prepared for the interaction with the stakeholders were:

- Posters with the scenarios as included in D 4.1, however with the updates including the gap indications. The updated posters with the gap indications are attached in APPENDIX A.
- Gap overview tables, including brief descriptions of the gaps and the final gap prioritisation as elaborated in D 4.1, yet with more detailed descriptions for the stakeholders (see A.6 Handouts of gap tables with brief descriptions and final prioritisation – grouped by scenario domain
- Table 15, Table 16, Table 17, Table 18, and Table 19 in APPENDIX A).

- Table of preliminary actions suggested per domain (the final versions of the actions are documented in chapter 3).

In addition to the stakeholder workshops, a verification workshop was carried out with the SCOOP4C steering board aiming to validate the suggested actions and measures. Finally, the partners used the meeting with the steering board to conduct the final review of the OOP4C vision.

2.2.2. Impressions and findings from stakeholder workshops

As mentioned above, different interactive workshops were carried out to facilitate the relevant stakeholders' engagement in the development of the roadmap for future areas of actions. The interactive sessions aimed at validating identified gaps and corresponding recommended actions as well as collecting more actions from relevant stakeholders. Organisational details of the workshops conducted in collaboration with work package 3 is provided in D 3.3 and information on the stakeholder engagement of work package 2 is included in D 2.2. The subsequent descriptions therefore concentrate on the inputs for the roadmapping and policy recommendations as aimed at in work package 4.

The first workshop contributing to the deliberation of roadmap actions was conducted at the end of April 2018 in Brussels. All five scenarios were discussed in the group discussions following the choreography as outlined above. Figure 5 and Figure 6 demonstrate the results of the group discussions.

Figure 5: Results from discussions on the education scenario (left) and healthcare scenario (right)
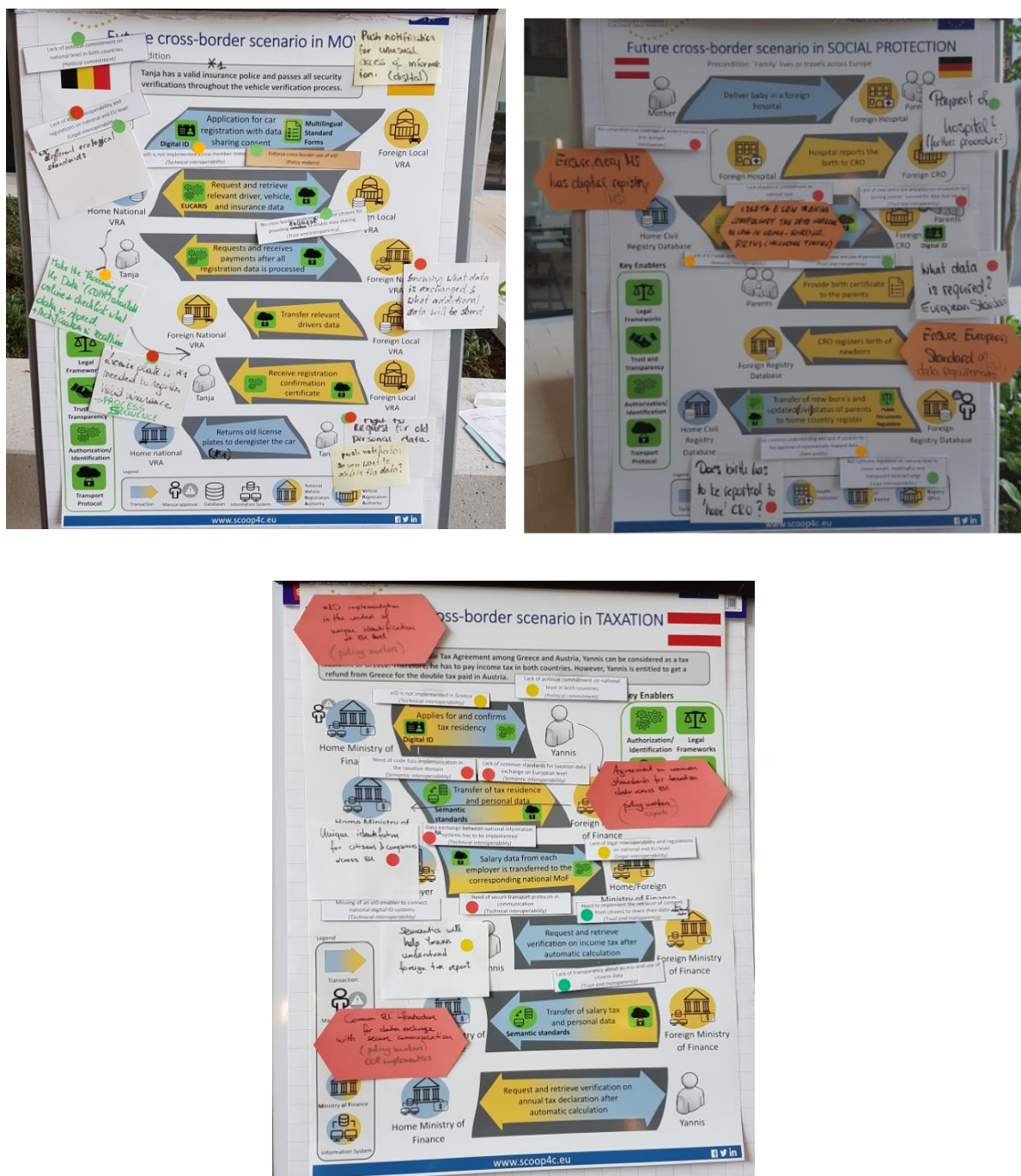
Figure 6: Results from discussions on the moving scenario (top left), social protection scenario (top right) and taxation scenario (bottom)

The next OOP stakeholder workshop was conducted in Koblenz end of May along the Democracy Weeks. It was conducted in German language and the participants were mostly students. As some students had their own scenario on the moving of animals in private scope, the top left image of Figure 7 shows this discussion and identification of roadmap actions, while the top right image addressed the taxation scenario from SCOOP4C. Since this workshop was the second of the roadmapping workshop, the taxation and moving scenarios benefitted from getting the roadmap actions suggested by the project team mostly validated. The German scenario was documented in a

student report (in German) and key lessons on overarching building blocks such as eID, legal grounds and political commitment have been inputted to the SCOOP4C roadmapping activities.
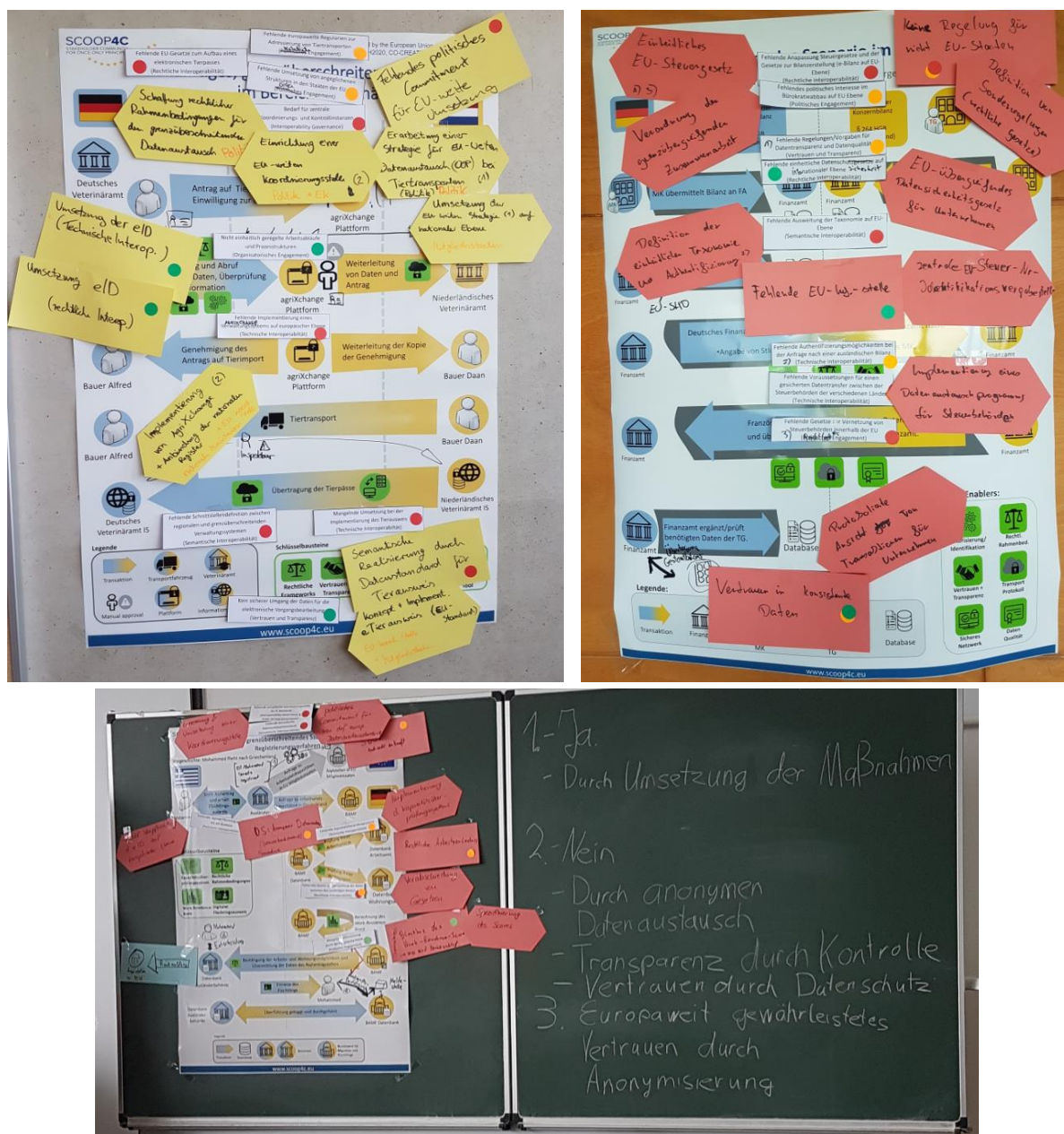
Figure 7: Results from discussions on a (new) veterinary scenario (left) and the tax scenario (right) (in German)

Along the discussions in the Koblenz workshop, the groups also deliberated questions such as:

1. Can citizens expect simplification in public service provisioning through the implementation of the OOP?
2. Is OOP moving us towards the transparent citizen by implementing the OOP or can we trust that public administrations handle our data thoroughly and parsimoniously? Are we having sufficient control over our data?

3. At which level of data exchange would we give higher trust to public administrations: among public administrations at municipal level, with governments at state and federal level, or even across Europe – are we trusting public administrations at all levels the same way?

The bottom scenario in Figure 7 shows the answers perceived by the students in the scenario social protection, i.e. a clear yes for question 1, no concern on transparent citizens because of anonymity and privacy protection as well as clear control of data exchange which also contributes to trust. The third answer is trust across Europe through anonymity. It should be mentioned that in more recent workshops in Koblenz, young people were a bit more selective and they would rather argue a phased approach to data exchange across MS since the level of trust is not equal to each other Member state.

Along the interactive workshop in Madrid in early July 2018, the future once-only principle scenarios in education, taxation, and moving domains as well as identified gaps and corresponding recommended actions in each scenario were discussed and further actions were suggested by participating stakeholders. Representatives of public and private agencies that are responsible to implement the cross-border OOP, civil society organisations, privacy advocates, and academia participated in this interactive workshop. According to previously recommended actions in the taxation scenario, "Creation and implementation of common standards by policy makers", the necessity of involving taxation and semantic experts as well as relevant public employees in the process of common standards development was pointed out. Furthermore, as taxation systems are under the influence of policy decisions, they could frequently change. Consequently, code lists in these domains should be updated annually.

In addition, a number of new actions was suggested by participated stakeholders to overcome existing gaps in taxation scenario. Along the group discussion, different time for tax declaration and tax payment in various Member States was pointed out. This could threat the accurate implementation of the taxation scenario. According to this issue EU-wide harmonisation of tax calendar was suggested. Moreover, translation of EU regulation on cross-border taxation to more understandable language for average people was mentioned as another action to increase public awareness in cross-border taxation's concepts.

The moving scenario as well as identified gaps and recommended actions in this scenario were discussed in another group. Participants discussed the identified gaps, their priority, and recommended actions. Moreover, new actions were suggested to improve the cross-border OOP implementation in moving domain. The shortage on the legal and organisational interoperability level was highlighted. Additionally, the challenge of different car insurances in different Member States was pointed out and harmonisation of the insurances was suggested to overcome this challenge. Participants agreed that this action would support the European Single Market as well.

The third group discussed the education scenario. The identified gaps and suggested actions were discussed and new gaps were identified such as the need for digital learning agreements that should base on a common educational resources ontology. Participants suggested that the European Student Card should be included in the scenario. The participants raised the need that harmonisation of this scenario should even go beyond the EU since students may do exchanges across the globe (in particular, English- and Spanish-speaking countries in Americas, Australia or New Zealand were listed as target countries). The participants, however, raised also the concern that harmonising Educational Resources across Europe may reduce the freedom of teachers to teach the subject's content the way they think is most appropriate. Hence harmonisation may hamper the degree of freedom in teaching. Finally the identification of additional needs and gaps has led to new actions to overcome barriers in cross-border once-only principle implementation in the education. Examples of actions were to promote the European Student card (ESC), to invest in a European ontology of educational resources, and to establish standards for digital learning agreements.

Along the EGOV-CeDEM-ePart 2018 conference in Krems, SCOOP4C partners organised a stakeholder workshop with academia. The workshop discussed the scenarios on education, social protection and moving. Some results of the workshop are visualised in the

Figure 8: Results from discussions on the education scenario (left) and the moving scenario (right) in the Krems Workshop

During a dedicated workshop at the OOP conference, in Vienna on the 24th September 2018, the partners used four world café groups to discuss the roadmap and the future of the OOP with the present stakeholders. Two of the groups focused mainly on the roadmap and the policy recommendations with the titles "Roadmap for OOP for citizens – realistic or not?" and "Policy recommendations for implementing OOP in Europe". The others discussed the "Business value of OOP for end users" and the "Stakeholder engagement for OOP cases in Europe". Regarding the roadmap for the OOP, the stakeholders reviewed the actions of each area and raised the following issues. The main aspect referred to the formulation of the actions for the roadmap, which seemed to be formulated too broad. The stakeholder expected the actions to be more detailed and differentiated. Additionally the interconnections in-between the different actions and areas should be stressed. As an example, the action regarding to ePayment sorted in the technical area, is also connected to the political commitment area. Furthermore, it was recommended to include the governance of cross-sector building blocks and architecture, through e.g. "one-fits-all" SLAs on building blocks, to divide the burden on investments. The concept of consent needs more deliberation and flexibility. There is more than one solution for this issue, therefore it is important to understand and amplify where consent is really needed. In order to understand the concepts a general harmonisation of the understanding of concepts (e.g. "working day") is needed. The participants agreed that principles and standards are key for the successful implementation of the OOP. However, currently there are several actions describing the need for code-lists and common vocabularies, which should be merged. A further need for investigation was identified for the cross-regulatory impact between the different regulations as GDPR, SDGR, eIDAS, etc. Additional aspects for the investigation could be to which extend centralisation is needed and a multi-stakeholder forum to connect the stakeholders worldwide. On a more critical note, the stakeholders raised the question, if the eased data exchange would tempt the gathering of more data than is really needed and creation of redundancy that the OOP initially should reduce. Furthermore, it was mentioned that the risk of fraud from the citizens as well as from administrations and the loop of redundant (wrong) data was not addressed enough. However, the participants agreed that the main factor for these issues could be the current culture, which implies that printed out data has more value than digital data. Therefore, the main need is a paradigm shift to stop copy or print out the data and trust the authentic (digital) source. Finally, the stakeholders mentioned that there might be a lack of motivation for the cross-border cooperation from some Member States to share data actively.

In the discussion on the policy recommendations, the areas of actions were divided between two groups. First, the moderator explained on what basis the existing policy recommendations were formulated. Then the participants were asked about their opinion on the existing and potentially new policy recommendations to successfully implement the once-only principle in Europe. With the first group, the area of 'data protection' was tackled. The discussion was mainly focused on the GDPR, data privacy, and the concern of the distribution of data. The participants highlighted the importance of the aspect that the citizens shall have the right to demand from public agencies what information is registered on them. In addition, the once-only principle has to be promoted further, in order to raise awareness e.g. based on good-practice implementation in other member states or in establishing legislation. With the second group, all areas were reviewed simultaneously, as, the participants mentioned, it would not be reasonable to discuss data protection without considering the aspect of trust and transparency. The participants also mentioned that the promotion of the once-only principle has to start already on a regional level (e.g. municipalities) to show the benefits and raise the incentives for further implementations. Moreover, one participant highlighted the aspect that the GDPR needs to be executed better. An example was the creation of one portal where the citizens could check all data available on them, in order to see where the data is stored and who has access to it. Additionally, the OOP best practice cases have to be promoted further within Europe in order to raise awareness and show its benefits. Furthermore, the public value aspect has to be taken more into consideration. Finally, the main issue for the policy recommendations was that single areas could not be discussed without the inclusion of others. Therefore, this aspect will be considered for the creation of the policy brief.

The partners collected the feedback and incorporated it into the further development of the roadmap and the policy recommendations.

In the last half year of the project, three more stakeholder workshops were conducted, one along the EGOSE conference in St. Petersburg in November 2018 and two workshops in Koblenz with students. The workshop at EGOSE contributed with insights on needs, which are mostly important for the Eurasian region. The participants agreed that there should be a better cooperation with the border regions of the EU and its bordering countries to leverage potentials of the OOP with these neighbouring regions.

The two last workshops with students in Koblenz aimed at deliberating, similarly as the workshop in End of May 2018, the three questions on benefits for citizens, means of transparency and control, as well as trust in actors beyond the own state. Students raised considerations that they would not trust another public administration the same level as they would trust the German public administrations. Proposals for policy recommendations were made that the OOP should be implemented in a phased approach, with neighbouring states that have the same or very similar quality and trust levels on data exchange.

2.2.3. Online Questionnaires

In order to facilitate additional interaction with the SCOOP4C community and further stakeholders from different sectors, questionnaires were developed for evaluating the five future cross-border OOP scenarios (documented in Deliverable D4.1) in Education, Social protection, Taxation, Moving and Healthcare domains. These questionnaires were developed and accomplished as part of the interactive methodology to gather recommendations for the potential actions from broader groups of stakeholders from public and private sectors. The implementation and provision of the questionnaires was done through the web portal of SCOOP4C and by integrating the questionnaires, which were implemented with the tool Limesurvey.

The concept of the questionnaire design was as follows – see also APPENDIX B: Online Questionnaire on policy recommendations:

- First, the respondent was guided through a scenario with the following means of his or her choice:
  - Screencast explaining the scenario interactions in a video
  - Animated slideshow with subtitle
  - Textual explanation of the scenario
- Next, the questionnaire was embedded through a frame so that the respondents could stay at the SCOOP4C page. Each questionnaire included up to 17 questions that could be divided into four main groups:

- o   Question 0 asked the respondents about their stakeholder roles according to Deliverable 2.1 in order to understand from what perspective a respondent was arguing.
- o   The second group gathered the respondent's recommendations on specific roadmap actions.
- o   The third group of questions was designed to identify respondent's expectations, overall insights and general responsibilities of specific groups of actors.
- o   The last part asked a few demographics: field of occupation, average age, highest level of education.

Since the questions from the third and fourth group were general and not linked to the specific domains, these questions were identical in every questionnaire and they are presented only once in the appendix.

The concept of questions from the group two covered the specific domain and focused on respondent's contribution to roadmap and policy recommendations. The questions described existing barriers as identified in Deliverable 4.1 for the seamless OOP implementation in different domains and a set of potential actions as put forward in the roadmap. Respondents could select one or more of the suggested actions or suggest new actions, which were not yet included. For the identification of potential responsible actors for solving the issue by implementing the suggested actions, a corresponding list of actors was included in the question. The respondents could choose the actor(s) from the provided list or add new actors.

The results of the questionnaires were further consolidated and elaborated in the policy recommendations by the project partners.

3. ROADMAP

The roadmap documented in this deliverable aims
   a) to recognise future areas of actions on the OOP implementation as well as on innovation based on the identified gaps from the gap analysis and
   b) to collect a comprehensive set of actions and measures in order to solve the identified gaps in various areas of actions.

The overall objectives of the suggested actions and measures is to enhancing the implementation of the OOP as well as to expanding and sustaining both, the concept and the execution of the OOP on different levels. The suggested actions in each area were grouped by topical areas.

The following chapters present the final consolidated actions, structured by their areas. The results were iteratively revised and adjusted by the partners, according to the insights from the stakeholder interaction as described in section 2.2.1. Furthermore, this roadmap was validated by the steering board members during the verification workshop conducted on 25th September 2018 in Vienna, Austria.

3.1. Identification of future areas of actions for effective OOP implementation

The future areas of actions base on the previous work of the SCOOP4C project and outline the different types of actions that are needed to achieve the successful implementation of the once-only principle. Generally, the successful implementation of the OOP is basing on the vision and defined in the scenarios established by the project partners; however, to reach the full potential of the administrative burden reduction, different actors have to work together and ensure various steps. These steps consist of single actions, each solving one challenge or barrier that is hindering the OOP. The challenges and barriers were identified in the previous work and reflect the gaps between the current situation and the desired scenarios for different OOP implementations. To recap the findings used for this deliverable, Table 1 illustrates the identified gaps from deliverable D 4.1 and demonstrates their classification, prioritisation, and the corresponding domains. The comprehensive gap table is also available on the project website in a more accessible and user friendly form, with filtering options – see https://scoop4c.eu/node/727.

Table 1: Existing gaps classified in different types in deliverable 4.1

Type	Name of gap	Priority (red=critical, orange=high, yellows=medium ,green=low)				
		Health	Education	Social Protection	Moving	Taxation
Political commitment	Lack of political commitments on ministerial level	H.3				
Political commitment	The contrast between the concepts of the flexibility of teaching and EU-wide standardisation		E.15			
Political commitment	Lack of sufficient political commitment at national level		E.1	SP.5	M.5	T.3
Political commitment	Limitation on possibility of birth certificate issuance in different languages			SP.11		
Political commitment	Lack of political commitment with focus on moving on national level in both countries				M.3	
Political commitment	Lack of sufficient political commitment on EU level		E.1			
Legal interoperability	Lack of clear implementation guides of national and European legislations	H.2				
Legal interoperability	Contrasting bilateral agreement between member states	H.9				
Legal interoperability	Lack EU-wide regulation (on insurance, double taxation, data required for birth certificates)	H.10		SP.9		T.1
Legal interoperability	Different proficiency requirements for pharmacist among member states	H.11				
Legal interoperability	Lack of regulations on national and European level to assure secure, meaningful, and transparent digital transmission between member states		E.12	SP.1		T.2
Legal interoperability	Various implementation in different member states according to a single EU regulation		E.18			
Legal interoperability	Diverse legal settings on birth registration procedure in different countries			SP.10		
Legal interoperability	Uncertainty of legal requirements for cross-border scenario			SP.12		
Legal interoperability	Lack of EU agreement on compensations in case of accidents				M.1	
Legal interoperability	Lack of EU regulation and standards for harmonising car's insurance				M.2	
Legal interoperability	Lack of legal interoperability and regulation on national and EU level				M.9	
Legal interoperability	Missing right for data subjects to request their old personal data*				M.14	
Legal interoperability	Different ecological standards on national level				M.17	
Semantic interoperability	Missing code lists of necessary objects		E.2		M.6	T.4
Semantic interoperability	Missing common standards for data exchange on European level		E.3	SP.6		T.5
Semantic interoperability	Lack of bilateral digital learning agreement between HEIs		E.13			
Semantic interoperability	Lack of competency matching for ECTS interoperability		E.17			

Category	Description					
Semantic interoperability	Lack of semantic enabler to map tax report from foreign country					T.13
Semantic interoperability	Lack of EU-wide unique identification for companies and taxpayers					T.14
Semantic interoperability	Lack of multilingual portals and Information Systems on national level				M.18	
Technical interoperability	Lack of essential infrastructures, including information systems, portals etc. on national level	H.7			M.11	
Technical interoperability	Lack of EU-wide secure transport protocol	H.8	E.4	SP.13		T.6
Technical interoperability	Uncertainties about technical stability	H.12				
Technical interoperability	Lack of use of EMREX as an EU-wide mapping tool		E.5			
Technical interoperability	Lack of connection between local systems to the European OOP infrastructure		E.6			T.7
Technical interoperability	Cross-border use of eID is not implemented across all member states		E.7			T.8
Technical interoperability	ESC is not yet widely implemented		E10			
Technical interoperability	Absence of national eID		E.16		M.10	T.9
Technical interoperability	Limitation of eID for covering educational information		E.14			
Interoperability governance	Lack of Service Level Agreements	H.1				
Interoperability governance	Potential conflict between legal, semantic, organisational, and technical interoperability enablers	H.13				
Motivators	Offering service for non-popular situation			SP.3		
Motivators	Not comprehensive coverage of related services in this domain			SP.4		
Data protection and privacy	Lack of possibility for citizens to limit access to their medical data	H.4				
Trust and transparency	Lack of a clear concept and solution for the consent of data subject for data sharing	H.5	E.11	SP.2	M.12	T.12
Trust and transparency	Non-transparent use and access of citizens' data	H.6	E.8	SP.7	M.7	T.10
Trust and transparency	Lack of solution for data sharing consent in emergency situations	H.14				
Trust and transparency	Lack of possibility for data subject to see which data is transferred or will be stored				M.8	
Citizen-centred design	Not sufficient consideration of the real needs of the citizens				M.13	
Citizen-centred design	Non-sufficient service for people with disabilities				M.15	
Data quality	Lack of a clear concept and solution for the (manual) approval of automatically mapped data		E.9	SP.8		T.11

This set of gaps is the final result, after several interactive workshops and iterative revisions. As they were verified by the community as well as by the steering board, they represent the areas that hinder the OOP the most. Therefore, the actions have to address them in a similar manner. Consequently, the partners used the types of the gaps as the future areas of the actions that are needed to reach full potential of the OOP implementations. The eleven future areas of actions on research and innovation toward a highly mature once-only principle implementation are the following:

- Political commitment area
- Legal interoperability area
- Organizational interoperability area
- Semantic interoperability area
- Technical interoperability area
- Interoperability governance area
- Motivations area
- Citizen-centred area
- Trust and transparency area
- Data protection area
- Data quality area

3.2. Actions and measures in relevant areas

The following subsections synthesise the actions that are recommended by the SCOOP4C community and the project partners. The corresponding step in the development of the roadmap is the identification of appropriate sets of actions and measures in cooperation with a wide range of stakeholders from different sections to overcome shortages and barriers in the areas of actions. All areas were structured in a similar approach. First, a general description provides an overview over each area; moreover, the current situation and the ideal state in that specific area of action are illustrated, using examples from the gap analysis. The individual recommended actions are displayed in a tabular form.

Besides a unique identifier, a short name and description of the action, the table shows the connection to the scenario domains and single gaps. Additionally, expected results formulate the tangible improvements through overcoming the corresponding gaps in each area. Nevertheless, a number of actions were recommended to generally enhance the cross-border implementation of the OOP rather than addressing a specific identified gap. Finally, appropriate stakeholders are assigned to each action, to display the responsibilities within each area. The table was initiated by the project partners and iteratively complemented with the inputs from the community. As there were basic and complex interconnections between the actions, the partners grouped the final set of actions to show the relations between them. At the end, the potential impacts of the implementation of the suggested actions were anticipated and documented for each area of actions in the tables. Likewise, responsible actors for implementing the actions have been identified. The full table with all roadmap actions is also available on the project website in a more accessible and user friendly form, with filtering options on different aspects – see https://scoop4c.eu/node/728.

3.2.1. Actions on the political commitment area

3.2.1.1. Description of area and existing gaps

Comprehensive political commitments on different levels particularly on national and EU level are a crucial requirement for the cross-border implementation of the OOP. Political commitments should stress the importance of the once-only principle implementation by pointing out their benefits for citizens and public authorities and by indicating its impacts on the society and economy. Consequently, political commitments are expected to boost the implementation of the needed enablers such as semantic and technical enablers and to encourage funding bodies to support the implementation of the OOP solutions in different domains.

There are variety of national (e.g. Data Sharing and Governance[10]) and EU (e.g. DSMS[11], eGovernment action plan 2016-2020[12]) political commitments in place that boosting the OOP implementation and development of the required building blocks. Moreover, while satisfying political commitments exist in some domains (e.g. healthcare) or some countries (e.g. Estonia), lack of political commitments in some other domains or member state could hamper the seamless execution of the OOP.

Therefore, further national political commitments in some member states as well as EU-wide commitments with focus on some specific domains (e.g. taxation) are needed to sufficiently facilitate the implementation of the once-only principle in various domains. Furthermore, all political commitments on different levels should be harmonised, since potential conflict between political commitments could prevent cross-border OOP realisation.

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[10] https://www.per.gov.ie/en/datasharing/

[11] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A52015DC0192

[12] https://ec.europa.eu/digital-single-market/en/european-egovernment-action-plan-2016-2020

3.2.1.2. Recommended actions

Table 2: Suggested actions on the political commitment area

No	Scenario domains	Name of action	Description of action	Measures	Expected results	Responsible actors
PA.1	Education (E.1, E.12, E.15); Health (H.3); Moving	Develop seamless political commitment as well as adjust current ones to specify commitments and responsibilities	Comprehensive political commitments on different levels should be developed to clearly define and differentiate commitments and responsibilities for the OOP implementation on different levels	Policy recommendation	The execution of political commitments will lead to satisfying collaboration in-between responsible governmental entities for the OOP implementations in all Member States	Policy makers
PA.2	Education (E.1, E.12, E.15); Health (H.3); Moving	Develop appropriate political commitment and adjust current ones to boost the implementation of OOP enablers	Development of seamless political commitments on EU and national levels to encourage the implementation of essential enablers towards the OOP implementations on different levels	Policy recommendation	Pave the way for the cross-border implementation of the OOP by accelerating implementation of the required building blocks and enablers	Policy makers
PA.3	Education (E.1, E.12, E.15); Health (H.3); Moving	Develop seamless political commitment with aim to encourage development of supportive legislations	Supportive legislations on different levels should be in place to make the cross-border OOP implementations possible as well as encouraging citizens to use the OOP services. For instance, legislations that guarantees the realisation of citizen's rights, including the right to erasure	Policy recommendation	Facilitation of cross-border implementations of the OOP and incensement of citizen's trust to use and participate in cross-border OOP services	Policy makers

No	Scenario domains	Name of action	Description of action	Measures	Expected results	Responsible actors
PA.4	Education (E.1, E.12, E.15); Health (H.3); Moving	Develop political commitment to resolve potential conflicting concept, policies, and legislations	Development of comprehensive political commitments with the aim of resolving potential conflicting concepts, policies, and legislations in various domains (e.g. freedom of teaching and EU-wide harmonisation of education).	Policy recommendation	The development will ease the cross-border OOP implementation by eliminating barriers, which occur from conflicting concepts	Policy makers
PA.5	Moving	Carrying out workshops and seminars on OOP implementation to convince decision makers and citizens	Encourage decision makers to support the OOP implementation and convince citizens to use the OOP services by referring to the successful OOP implementations, pointing out expected benefits, and highlighting its positive impacts on the economy and society. Academia, NGOs, and governments should collaborate closely to organise workshops, seminars, and other means of dissemination for this action	Organization of seminars and workshops	Implementation of this action will leads to more willingness of the OOP implementation and more acceptances of the OOP services among the citizens.	Academia; NGOs; Governments
PA.6	Education (E.1)	Implement the OOP pilot (OOP services) projects in different domains	Carrying out number of the OOP initiations on a small scale (pilot projects) with aim of demonstrating wide benefits of the OOP implementation, in particular administrative burden reduction.	Implementation of the pilot projects	Pilots could point out various benefits of the OOP implementation for all relevant stakeholders; Moreover, this could indicate potential gaps and further requirement for cross-border implementation of the OOP in a higher scale.	Implementers

No	Scenario domains	Name of action	Description of action	Measures	Expected results	Responsible actors
PA.7	Taxation (T.3)	Promote digitalisation in the public sector and implement more digital services	Promoting digitalisation in the public sector as well as implementation of wide range digital public services will enhance the OOP implementation in different domains	Implementation of public services	Close collaboration between the digital provision of public services and the OOP implementation more digital public services could enhance the OOP implementation	Policy makers on national and European level; Implementers

3.2.2. Actions on the legal interoperability area

3.2.2.1. Description of area and existing gaps

Proper legal base on local, national, and EU level is vital for the seamless cross-border implementation of the OOP. Appropriate legislations are needed to facilitate secure and transparent data exchange between public authorities in different member states, clearly define citizens' right for access to their personal data, to support transparent access and use of personal data, to assure data protection and privacy, and to allow citizens' data sharing between public authorities. Moreover, harmonisation between existing legislations on different levels is essential. Proper regulations should pave the way for data sharing and other vital components for the smooth implementation of the OOP.

Current EU regulations as well as national regulations facilitate the OOP implementation in some domains and some member states. However, there are different levels of maturity between national regulations among European countries. When national regulations in some member states provides concrete regulation base for data exchange and implementation of the OOP, lack of accurate regulations in some other countries threats the seamless implementation of the OOP in some or even all domains. Furthermore, EU-wide regulations or harmonised national regulations are missing in some domains. For instance, either EU-wide regulation or harmonised bilateral agreements on double taxation are necessary for cross-border implementation of the OOP in the taxation domain.

3.2.2.2.   Recommended actions

Table 3: Suggested actions on the legal interoperability area

No	Scenario domains	Name of action	Description of action	Measures	Expected results	Responsible actors
LA.1	Education (E.3, E.12, E.18); Health (H.2, H.11); Moving (M.2, M.17); Social protection (SP.9, SP.10); Taxation (T.2)	Make a decision on a sufficient harmonisation degree for national legislations as well as the areas for harmonisation	Define the policy domains, in which the harmonisation of national legislations in all Member States is essential for the OOP implementation. Furthermore make decision on the sufficient level for harmonisation	Policy recommendation, Implementation of regulations	Provide a clear view on the areas of national legislations that need to be harmonised on the EU level	EU policy makers
LA.2	Education (E.3, E.12, E.18); Health (H.2, H.11); Moving (M.2, M.17); Social protection (SP.9, SP.10); Taxation (T.2)	Harmonisation of national legislation	National legislators and policy makers should reform and harmonise national legislations in many fields, regarding the substance of the topics (not just the form for transfer of data but e.g. entry requirements to higher education; how components of drugs are listed and if patients can choose between different makes of drugs; motor vehicle requirements; tax; etc.)	Implementation of regulations	Harmonised legislation in EU Member States (i.e. not identical legislation but harmonised to a sufficient degree to permit free movement) so that there can be meaningful data transfers across Europe. This should not leading to identical legislations but abolishing differences that make sharing and transferring data difficult caused by the purpose and context of the data use	National policy-makers and legislators

No	Scenario domains	Name of action	Description of action	Measures	Expected results	Responsible actors
LA.3	Education (E.18); Health (H.4, H.5, H.6); Moving (M.7, M.8, M.12, M.14); Social protection (SP.2, SP.7); Taxation (T.10, T.12)	Develop guidelines accompanying all EU regulation	Development of guidelines such as complementary documents to all EU regulations (e.g. GDPR) with the aim of avoiding different interpretation and various implementation on national levels	Development of guideline	Development of convenient guidelines by EU policy makers could lead to corresponding interpretations of EU legislations and consequently more harmonisation at EU level and more sufficient cross-border OOP implementation (e.g. in case of GDPR people will trust the data protection of other Member States as much as that of their state of origin and accept the cross-border data exchange).	EU policy makers
LA.4	Moving (M.9); Social protection (SP.12)	Develop EU legislations to facilitate harmonised and clear decision making structure	For both national and cross-border OOP implementation, a harmonised and clear decision making structure is needed in all Member States.	Implementation of regulations	Clear and harmonised decision-making structure in all Member States through EU legislation or policy recommendation	EU legislators
LA.5	Moving (M.9); Social protection (SP.12)	Adjust national legislations according to EU legislation to define clear decision-making structures as well as responsibilities	Insufficient decision-making power at the correct level with unclear responsibilities could threat the cross-border OOP implementation. Consequently, development of legal acts and guidelines, which clearly define responsibilities at different levels of governance is recommended	Implementation of regulations	National legislations will facilitate cross-border cooperation of national entities and furthermore, ease the OOP implementation at different levels.	National legislators

No	Scenario domains	Name of action	Description of action	Measures	Expected results	Responsible actors
LA.6	Moving (M.9); Social protection (SP.1, SP.9, SP.10); Taxation (T.2)	Adjust legislation with aim to update form requirements in public sector according to e-government and OOP	Form requirements in part of the current legislations are incompatible with the concept of OOP. Legislations should be amended according to the form requirement with aim to support implementation of the OOP and e-government.	Research of sufficient legislation base; Implementation of regulations	Abolished any incompatible between OOP implementation and form requirements. Consequently eliminate the legal barriers for the OOP implementation and data sharing between public sector entities	National legislators

3.2.3. Actions according to the organizational interoperability area

Table 4: Suggested actions on the organisational interoperability area

No	Scenario domains	Name of action	Description of action	Measures	Expected results	Responsible actors
OA.2	Education (E.12, E.18); Health (H.2); Moving (M.9); Social protection (SP.1)	Adjust organisational structures with aim to clearly define the national contact points	Clear definition of the organisational structures at national level to determine national contact points. This can ease the cross-border cooperation between national entities from all Member States	Policy recommendations	Seamless cross-border cooperation will support smooth cross-border OOP implementation	National policy makers
OA.4	Education, Health, Moving, Social Protection, Taxation	Reference processes for interaction in secure data exchange	EU-wide reference process should be defined and implement in order to support secure interaction and data exchange between different entities from all Member States	Design processes; Implementation of the systems	Secure, clear, and precise processes for data exchange, which will lead to accurate OOP implementation	EU policy makers; EU implementers

No	Scenario domains	Name of action	Description of action	Measures	Expected results	Responsible actors
OA.5	Education, Health, Moving, Social Protection, Taxation	Rules and guidelines for authorisation on data access	Eligible entities to access personal data should be defined with consideration of trust and transparency	Implementation of regulations; Development of guidelines	Higher level of data protection and transparency and consequently, more trust on OOP services	Legislators; Policy makers
OA.6	Health (H.6); Moving (M.8, M.14)	Ensure transparent OOP services	Design and implementation of transparent OOP services according to the EU and national legislations. This could be achieved by implement citizen's control for own data: Notify / get citizens' consent on how their data is used (e.g. who has/can have access; who has / can view), allow the citizen to change such preferences, notify the citizen of unusual access to data, allow the citizen to view and delete own data; Update relevant legislation if needed.	Design (transparent) services; Implementation of services	Higher citizen satisfaction and acceptance of the OOP solution. . Transparency is important for citizens as citizens need to be in control of their data	OOP implementers
OA.7	Education (E2, E4, E8); Health (H11); Moving (M12); Social protection (SP13)	Develop rules of authorisation of organisations and persons on data access	Member States have bilateral and had hoc solutions for giving rights to use services (data) for administrations and persons.	Development of Guidelines Development of tools for authorisation.	The processes of authorisation of administrations (rights are granted by service providers) and authorisation of persons are separated (granted by service consumers). Tools and guidelines are prepared.	Coordination on the EU level; Policy makers and implementers on national level
OA.8	Education, Health, Moving, Social Protection, Taxation	Define effective organizational structures for OOP implementation	Appropriate organizational structures at national and EU level are necessary for seamless OOP implementation. An effective	Design structure	Harmonised organizational structures across Europe will facilitate appropriate cross-border cooperation and consequently pave	EU policy makers

No	Scenario domains	Name of action	Description of action	Measures	Expected results	Responsible actors
			organization structure should be defined at EU level and following at national level.		the way for seamless OOP implementation	
OA.9	Moving (M.16)	Provide information on national portals and information systems at least in English in addition to the local language	Provision of information and services on national portals and information systems in two different languages (English and local language). Therefore policy makers and national implementers have to work together to achieve high quality translations. The multilingual information could also contribute to and profit from the implementation of vocabularies and mapping services.	Policy recommendation	Information in additional languages will remove language barriers and enhance the freedom of mobility of citizens of the EU Member States. Citizens can apply easy for services in different EU Member States and cross-border processes can benefit from the multilingual offers.	Policy makers; National implementers
OA.10	Education (E.13)	Enter into EU-wide digital learning agreements	Entering and creating more EU-wide digital learning agreements between EU universities to facilitate easy possibilities for students to study abroad and enhance the mobility of the students after finishing their studies.	Policy recommendation	Facilitation of easy and/or automated mapping of courses and credits achieved by students in the host university to the education system of the home university and vice versa. The agreements will lead to a higher number of international and more flexible graduates.	University directors; policy makers on national and EU level

3.2.4. Actions on the semantic area

3.2.4.1. Description of area and existing gaps

Cross-border communication and data exchange is an essential part for the cross-border implementation of the once-only principle. Despite the fact of existence of different languages, standards, and procedures (due to different systems in each country) between European countries, semantic enablers are necessary for communication and meaningful data exchange among member states. EU-wide common vocabulary and standards are some important instances of the crucial semantic enablers to facilitate accurate data exchange on EU level.

Existing EU or global standards and vocabulary as well as current bilateral agreements between some member states facilitate data mapping and meaningful data exchange in some domains and in between number of member states. Nevertheless, accurate EU-wide common vocabulary and standards as well as data mapping tools should be developed in order to assure accurate data mapping and data exchange on EU level.

3.2.4.2. Recommended actions

Table 5: Suggested actions on the semantic area

No	Scenario domains	Name of action	Description of action	Measures	Expected results	Responsible actors
SA.1	Taxation (T.5); Social protection (SP.6); Education (E.3)	Agree on, create and implement common standards	EU-wide agreement, creation and implementation of common standards for data exchange. There are already a number of common standards, but not for every area. Moreover, these are not used by every member state.	Implementation of enablers	Common standards enable and simplify cross-border data exchange.	EU implementers; Policy makers
SA.2	Social protection (SP.6); Education (E.2, E.3)	Define and implement EU-wide vocabulary	Definition and implementation of common EU-wide vocabulary. D-CAT is already in place and could be used in every member states. D-CAT is a standard model and vocabulary that facilitates the consumption and aggregation of metadata from multiple catalogues. Policy makers have to support implementers on the EU level to define and enforce a common vocabulary.	Implementation of enablers	Common vocabularies enable and simplify cross-border data exchange. Moreover, they enable automated translation and mapping for cross-border services, thereby reducing errors and administrative burden.	EU implementers; Policy makers
SA.3	Taxation (T.4); Moving (M.6); Education (E.2)	Develop and implement multilingual code lists	Development and implementation of multilingual code lists of objects in each respective domain (e.g. universities and courses in the education domain) will ease cross-border OOP implementations. Policy makers and EU implementers have to work together to achieve code lists that will we applicable throughout the whole EU.	Implementation of enablers	Multilingual code lists enable and simplify data exchange between EU member states, reducing administrative burden and easing the general processes of OOP implementations.	EU implementers; Policy makers

No	Scenario domains	Name of action	Description of action	Measures	Expected results	Responsible actors
SA.4	Education (E.2, E.3); Taxation (T.13)	Develop mapping services to map data sets needed for standard public services	Development and implementation of intelligent mapping services to facilitate meaningful cross-border data exchange. Service provider as well as national and EU implementers have to the analyse the national data sets of the most common public services to create mapping tools that will translate and transfer the data in cross-border OOP implementations.	Implementation of enablers	Mapping services reduce the administration burden citizens and clerks experience in the transfer of information between EU Member States. Moreover, automated mapping would reduce translation mistakes and misinterpretations. The more mapping services are introduced the more public services can be addressed.	EU and national implementers; Policy makers; Service provider
SA.7	Education	Develop and implement an European Diploma	Bachelor and master degrees are still very different in and between member states and they are not always fully accepted by other HEI´s. Development and implementation of the European Diploma can overcome this issue. To achieve this, relevant stakeholders of HEIs and EU implementers have to agree on common frameworks and approaches. Thereby, they could help generating EU-wide learning agreements.	Implementation of enablers; Policy recommendation; Implementation of regulations	Harmonisation of diplomas from EU students and enhancing expansion of studies in different Member States. Furthermore, it will ease the acceptance of diplomas in cross-border matters and enable easier working opportunities for citizens.	EU implementers; Relevant stakeholders in the education domain

3.2.5. Actions on the technical area

3.2.5.1. Description of area and existing gaps

Technical infrastructures are among the essential building blocks for the cross-border implementation of the once-only principle. Therefore, necessary technical enablers including digital registries, information systems, and portals should be in place on national and EU level to provide needed foundation for the cross-border OOP implementation. Moreover, national infrastructures should be on a reasonable maturity level and harmonised in order to facilitate indispensable component for the cross-border OOP such as cross-border data exchange. Other instances of required technical facilities are EU-wide digital mapping tools, authentication and identification mechanism, and etc.

Currently, needed technical infrastructures on national level are in place in the majority of member states; however, a part of the existing national facilities need further development in order to facilitate the cross-border implementation of the OOP. For instance, the national eID is implemented in the majority of European countries and is in a developing phase in other countries. Nevertheless, the cross-order use of eID is not facilitated yet. Additionally, some technical enablers such as eDelivery are available on European level; however, it should be implemented in different areas for cross-border data exchange. The identified challenges in this area are listed in Table 1 and corresponding recommended actions are illustrated in the following subchapter.

3.2.5.2.   Recommended actions

Table 6: Suggested actions on the technical area

No	Scenario domains	Name of action	Description of action	Measures	Expected results	Responsible actors
TA.1	Education (E.7, E.16); Moving (M.10); Taxation (T.8, T.9)	Implement cross-border eID according to eIDAS	As eID is enforced in most Member States through the eIDAS, the use of the eID should now be also applied to cross-border services. Therefore national implementers have to review the national standards and adjust them accordingly.	Implementation of enablers	The cross-border authentication and authorisation through national eID will ease the mobility of citizens across the EU and boost cross-border OOP implementations in general.	National implementers
TA.2	Taxation (T.16); Social protection (SP.13); Health (H.8); Education (E.4)	Implement EU-wide enablers and infrastructures	Widespread and effective implementation of the EU-wide technical enablers such as eDelivery as well as infrastructures (e.g. information systems and portals) to assure secure EU-wide communication	Implementation of enablers	Facilitates secure communication and data exchange between entities in different countries	EU implementers
TA.3	Education (E.10)	Implement the available EU-wide student card on national level	The European student card was developed in an EU funded pilot, which was completed in June 2018. Member States that were not part of the pilots have to adjust their systems to be able to accept the ESC. Therefore the policy makers have to generate according policies instructing the implementers to develop the expected infrastructure etc.	Implementation of enablers	The use of the ESC achieves simplified transfer of student records and other educational data as well as harmonise national standards for student cards and related data. Furthermore the facilitation of an European Diploma and the appliance of digital learning agreements will be enhanced.	Policy makers; OOP implementers

No	Scenario domains	Name of action	Description of action	Measures	Expected results	Responsible actors
TA.4	Moving (M.11)	Extend ePayment system to national and international payment services	To reduce administrative burden and provide access to a wider range of citizens, the EU-wide ePayment system should be usable with national and international private payment services like PayPal or SofortÜberweisung.	Implementation of enablers	Facilitate cross-border secure payment to increase citizens' mobility across Europe and attract more citizens to use public services.	Implementers on both national and EU level
TA.5	Social protection	Develop basic registries on national level	A key to implement successful OOP services is to provide the necessary connections to the relevant data storages. National implementers have to make sure that necessary basic registries exist on their national level and have the expected interfaces to connect to the provided infrastructure.	Implementation of systems	Sufficient national registries in different domain will simplify the digital data exchange in public services on national and EU level. The access to these registries will reduce the administrative burden for both sides and allow faster processes for public services.	National implementers

3.2.6. Actions on the trust and transparency area

3.2.6.1. Description of area and existing gaps

As mentioned earlier, cross-border data sharing between public authorities is a fundamental part of the OOP implementation. Additionally, consent from citizens as data subjects is needed for data sharing. Consequently, transparency in data transmission is a critical requirement in order to achieve citizens' trust and their consent for data sharing. Moreover, trust and transparency is one of the main classifications of identified gaps (Table 1 demonstrates 12 gaps that identified in this area) in the earlier tasks of this work package. In order to reach a convenient level of transparency, citizens should be able to control whom, why and when access and use their personal data. Additionally, they have to be able to provide data sharing consent for domestic as well as cross-border data sharing.

Diverse national regulations and commitments according to trust and transparency as well as national infrastructures (e.g. portals) with various level of transparency could prevent transparent implementation of the OOP on the European level. Moreover, there are different definitions and various solutions for getting data sharing consent among member states. Lack of transparent infrastructures such as information systems and portal on both national and EU level is another challenge in this area.

3.2.6.2.   Recommended actions

Table 7: Suggested actions on the trust and transparency area

No	Scenario domains	Name of action	Description of action	Measures	Expected results	Responsible actors
TTA.1	Education (E.11); Health (H.5, H.14); Moving (M.12); Social protection (SP.2)	Implement transparent OOP solution for providing consent on data sharing	Facilitate provision of the data subject's consent for data sharing (including emergencies in case you are not able to provide) by defining an explicit and common concept of the process.	Policy recommendation; Implementation of enablers	Clear concept and seamless implementation for providing consent of data sharing will increase the level of trust on OOP implementations	EU and national implementers; Policy makers
TTA.2	Health (H.6); Social protection (SP.7); Education (E.8); Moving (M.7, M.8); Taxation (T.10)	Develop transparent mechanisms of personal data processing	Provide transparency in procedures for accessing and processing of personal data in the OOP implementation by development of clear and acceptable tracking (reviewing) possibility for citizens. In addition, appropriate supporting political commitments, regulations and technical infrastructures are needed.	Design of processes; Development of concepts	Transparency in the OOP implementation will lead to higher level of trust on the OOP solutions. Data subject is able to identify and aware by whom, where and why their personal data was used, which builds trust.	Policy makers, EU and national implementers; Service providers
TTA.3	Health (H.6); Social protection (SP.7); Education (E.8); Moving (M.7, M.8); Taxation (T.10)	Develop instructions for OOP service providers	Elaboration of detailed instructions for service providers for all occasions, including accidental misuse, in order to reduce excessive personal responsibility of clerks.	Design of processes	Higher level of service provider's confidence. Transparency in the OOP implementation will lead to higher level of trust in the OOP solutions.	EU and national implementers; Service providers

No	Scenario domains	Name of action	Description of action	Measures	Expected results	Responsible actors
TTA.4	Health (H.6); Social protection (SP.7); Education (E.8); Moving (M.7, M.8); Taxation (T.10)	Inform citizens about transparent implementation of the OOP	Active distribution of educative and promotional materials on transparency aspects of OOP services among the citizens by government.	Awareness raising to citizens	Public awareness about transparent OOP implementation. Higher level of citizens' trust. Willingness of citizens to cooperate in terms of use of personal data and data sharing consent.	National government
TTA.5	Health (H.6); Social protection (SP.7); Education (E.8); Moving (M.7, M.8); Taxation (T.10)	Develop EU-wide transparency regulation	Development of regulation on EU level, in order to grant transparency on the use of personal data that applies to all the EU-Members (in order to grant cross-border services).	Implementation of regulations	An EU wide transparency regulation is implemented and citizens are aware of it. Transparent use of personal data is guaranteed by government.	EU and national governments EU and national legislators
TTA.6	Health (H.6); Social protection (SP.7); Education (E.8); Moving (M.7, M.8); Taxation (T.10)	Provide right to withdraw data sharing consent as well as to modify their personal data	Citizens should have the right to withdraw their consent for data sharing as well as to, to correct and even delete (if not necessary) their personal data at any time	Policy recommendation	More control on the correctness and use of personal data leads to higher level of trust	Policy makers legislators

3.2.7. Actions on the motivation area

3.2.7.1. Description of area and existing gaps

Motivation is essential to encourage citizens to accept the OOP services provided on national and EU level. Moreover, Government should be motivated to implement the once-only principle solutions as well. In order to motivate citizens as well as public authorities, it is essential to highlight benefits and impacts of the OOP implementation, including administrative burden reduction, service that is more satisfying and higher quality of public sector's services.

Non-accurate cross-border implementation or limited OOP services could demotivate individuals and public sectors. Lack of awareness of the potential benefits and positive impacts of the cross-border OOP solutions could be consider as another challenge in motivation area.

3.2.7.2. Recommended actions

Table 8: Suggested actions on the motivation area

No	Scenario domains	Name of action	Description of action	Measures	Expected results	Responsible actors
MA.1	Social protection (SP.3, SP.4); Health	Expand existing OOP future scenarios to develop more comprehensive OOP solutions in different procedures.	Extension of the OOP scenarios with the aim of including extra procedures (including more public services in specific domain). Ensure the coverage of different services in order to raise the motivation aspect.	Design of future OOP scenarios	As the extended scenarios are covering a wider range of services in each domain, citizens' participation and motivation to use OOP solutions will increase.	Service provider; EU and national implementers EU
MA.2	Social protection; Health; Taxation; Moving; Education	Inform citizens about benefits and positive impacts of the (cross-border) OOP implementation	Making citizens aware of the benefits such as administrative burden reduction, cost and time saving etc. as well as the positive impacts on society and economy, which come by the (cross-border) OOP implementation	Awareness raising among citizens	Increased level of citizen's interest on services, higher level of awareness of benefits and constructive impacts of the OOP solutions will lead to more motivation among citizens.	Governments at national and EU level; Academia, NGOs
MA.3	Social protection; Health; Taxation; Moving; Education	Communicate knowledge about benefits and positive impacts of the (cross-border) OOP implementation to citizens through PR campaigns	Conduct PR campaign through major communication channels such as social media, TV, newspaper, etc., in order to reach different citizen groups.	Awareness raising among citizens	Increased level of citizen's interest on services. High level of awareness of benefits and constructive impacts of the OOP solutions.	Policy makers, service providers

No	Scenario domains	Name of action	Description of action	Measures	Expected results	Responsible actors
MA.4	Social protection; Health; Taxation; Moving; Education	Educate citizens about benefits and positive impacts of the (cross-border) OOP by conducting workshops and distributing materials.	Organization of educational events/workshops for citizens, as well as development and distribution of electronic or paper based brochures/booklets about the advantages of cross-border OOP.	Awareness raising among citizens; Active citizens engagement	Increased level of citizen's interest on services. High level of awareness of benefits and constructive impacts of the OOP solutions. Higher level of citizens' engagement.	Service providers
MA.5	Social protection; Health; Taxation; Moving; Education	Develop a standardized business process in cross-border OOP services with equivalent purposes/functionalities EU-wide.	Implementation of standard business processes to guarantee intuitiveness and user friendliness in OOP in equivalent/adjacent services offered cross-border, so that both service providers and end users could intuitively understand the purposes and logic of those services.	Design of processes	User-friendliness and acquaintance of solution, which leads to higher citizens' motivation to use the service.	EU and national implementers
MA.6	Education (E.11); Health (H.5, H.14); Moving (M.12); Social protection (SP.2)	Implement a comprehensive solution for sharing consent once	Develop a comprehensive solution for requesting subject's data sharing consent in order to avoid redundancy in iterative steps of sharing consent. i.e. subject can share her/his consent once for different OOP services	Implementation of enablers	Increased motivation of citizens to use more accessible and unsophisticated services	EU and national implementers

3.2.8. Actions on the data protection area

3.2.8.1. Description of area and existing gaps

Importance of the cross-border data sharing was described earlier. Data protection is necessary to assure and fulfilling data protection regulation on different levels. Moreover, seamless regulations on different levels needed to assure appropriate data protection in process of the cross-border data sharing. Same level of data protection should be assured in different member states.

There are number of data protection regulation on both national and EU level such as General Data Protection Regulation, GDPR[13] and national data protection regulations. Nevertheless, different understanding of EU regulation and various mapping of the EU regulation into the national rules may prevent accurate data protection. While in some countries citizens can limit the access to their personal data, in other member states citizens cannot define the level of access to their personal data-by-data consumers.

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[13] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32016R0679

3.2.8.2. Recommended Actions

Table 9: Suggested actions on the data protection area

No	Scenario domains	Name of action	Description of action	Measures	Expected results	Responsible actors
DPA.1	Education; Social protection; Taxation; Moving; Health	Agree on and implement common data protection standards	Making agreement on and implementation of the common data protection standards for cross-border data exchange	Implementation of regulations; Agree on common technical solutions	Data protection standards paves the way for coherent cross-border data exchange	EU implementers; MS implementers; Policy makers on national and EU level; Service providers
DPA.2	Education; Social protection; Taxation; Moving; Health	Implement mandatory technical modules for citizens' consent for data sharing	Service providers should implement mandatory technical modules for any OOP service so that citizens can give or withdraw their consent for any OOP service according to Policy maker laws	Implementation of enablers	During the application for a cross-border service, citizens can choose if their data should be automatically exchanged between different member states or not	Policy maker ; Service provider
DPA.3	Education; Social protection; Taxation; Moving; Health (H.4)	Right to withdraw consent for data sharing any time	Citizens should have right to withdraw their consent for data sharing any time easily and transparently if they feel a misuse of data. This also means they need to have a transparent overview of the use of their data and to whom at which time they have given their consent to, i.e. in their citizen portal. This right should be included in corresponding legislation.	Policy recommendation; Implementation of regulations	More control and transparency of the use of data for citizens. Consequently, more trust of citizens in the state and the use of data.	Policy makers; Service provider

No	Scenario domains	Name of action	Description of action	Measures	Expected results	Responsible actors
DPA.4	Education Social protection Taxation Moving Health	Control of the use of data by an independent institution	An independent agency, like EU data protection officer should overlook the use of data for cross-border digital public services in order to avoid misuse of data	Implementation of regulations	More trust and transparency, control over the misuse of data	Policy makers at EU and MS level
DPA.5	Education Social protection Taxation Moving Health	Harmonized implementation of GDPR	GDPR is already in place, but rules are not harmonised and there is no clear understanding what has to be implemented in terms of data protection.	Implementation of regulations	Clear rules on data protection in the EU and all member states.	EU and national policy makers

3.2.9. Actions on the interoperability governance area

3.2.9.1. Description of area and existing gaps

Different public authorities as well as businesses from different member states supposed to collaborate closely and share citizens' personal data among each other. This requires appropriate interoperability governance framework on EU level. It should clearly define the roles and responsibilities of different actors in public authority as well as business.

There are some bilateral and EU-wide agreements to facilitate cross-border collaborations in some area or among some member states. However, accurate EU-wide interoperability governance model is needed for the seamless implementation of the OOP. This model should be able to facilitate cross-border collaboration in various domains between different public authorities as well as between public authorities and private sector.

3.2.9.2.   Recommended actions

Table 10: Suggested actions on the interoperability governance area

No	Scenario domains	Name of action	Description of action	Measures	Expected results	Responsible actors
IAG.1	Education (E4, E11; Moving (M4); Social protection (SP13); Health (H7, H8); Taxation (T2, T3)	Investigate domains with lack of sufficient eDelivery nodes in all Member States	An eDelivery node should be in place in each domain and all Member States in order to facilitate cross-border and cross-domain electronic data and document exchange. This action aims to investigate and point out any area where the eDelivery node is missing.	Research on successful diffusion of enablers	Academia and EU policy makers should come together to investigate and specify all policy domains in the Member States, where the eDelivery is needed. The results will benefit to the implementation and interaction between Member States.	Academia, EU policy makers
IGA.2	Education (E4, E11; Moving (M4); Social protection (SP13); Health (H7, H8); Taxation (T2, T3)	Establish an eDelivery building block in specified domains in all Member States	Seamless implementation of the eDelivery node at the identified domains on the national level according to the evaluated deficiency.	Implementation of enablers	Implementation of the eDelivery building blocks in all Member States will ease the implementation and execution of the cross-border OOP services.	National implementers
IGA.3	Education (E14, E16); Social protection (SP8); Health (H8); Moving (M10); Taxation (T8, T9)	Implement all components of eIDAS	The eIDAS regulation covers various components including the eID for individuals, a digital seal for organisations, issuance of certificates, security tokens, digital signatures, timestamping, validation of certificates, and trust service list. However, some of the eIDAS components are not implemented at all Member States.	Implementation of regulation	National implementers are responsible to make sure that all components of the eIDAS regulation are achieved. This will improve security and facilitate the cross-border authentication of individuals and the validation of communications and data exchange.	National implementers

No	Scenario domains	Name of action	Description of action	Measures	Expected results	Responsible actors
IGA.4	Education (E.1, E.15, E17, E18); Health (H13); Moving (M5); Social protection (SP.5)	Improve interoperability governance by legal EU acts	The improvement should be achieved through the development of legal acts and corresponding guidelines according for clear organisational, legal, semantic, and technical decisions and solutions.	Implementation of regulations	Accurate legal EU acts will increase sufficient competencies and finances for realising governance processes according to EIF and EIRA.	EU legislators
IGA.5	Education (E10, E13, E17, E2, E3); Moving (M16, M17)	Policy recommendations on the use of semantic assets to improve semantic interoperability and machine readability	Policy makers on EU and national levels should make a decision on the use of cross-border semantic assets to make sure all documents are at a minimum level of machine-readability (no Word Excel, PDF, …).	Policy recommendation	Messages, documents and data are machine readable and semantically enriched and linked. Consequently, information systems understand content of data from different Member States	Policy makers on EU level; Policy makers on national level

3.2.10. Actions on the citizen-centred design area

3.2.10.1. Description of area and existing gaps

Citizen-centred design is necessary to fulfil the real needs of the citizens as service users. The lack of citizen-centred design could lead to development of insufficient and non-popular service.

Different groups of citizens have various or even inconsistence needs, which can make challenge the citizen-centred design. One important challenge that identified in this area in development of the OOP services, which cannot meet the needs of people with disabilities.

3.2.10.2. Recommended actions

Table 11: Suggested actions on the citizen-centred design area

No	Scenario domains	Name of action	Description of action	Measures	Expected results	Responsible actors
CCA.1	Education; Moving (M.13, M.15)	Collect the information on citizen needs for OOP implementation beforehand	Initially information about the needs of the end citizens should be collected by means of direct interaction between service providers and citizens, i.e. organization of surveys, workshops, consultations etc. For instance, the specific needs of citizens with disabilities to use OOP solutions will be identified correctly.	Research on citizen's needs in OOP services; Active citizen engagement	More comprehensive and inclusive OOP services, higher acceptance levels of OOP implementations, a feeling of excitement and ownership in the society.	OOP implementers; Citizens
CCA.2	Education; Moving (M.13, M.15)	Plan the requirements for OOP implementation according to citizen needs through involvement of service providers	Implementers should consider the experience of service providers in terms of requests and complaints of the citizens, regarding existing services, to develop a concept of citizen oriented OOP solution from the beginning.	Research on citizen's needs in OOP services; Active citizen engagement	Higher level of citizen's reliability on services. Better and inclusive OOP services, higher acceptance levels of OOP implementations.	OOP implementers, service providers
CCA.3	Social protection; Health; Taxation; Moving; Education	Develop OOP scenarios based on collected information on needs to create citizen centred solutions	Regularly perform analysis of state of play in different OOP domains in order to be able to develop relevant citizen cantered OOP scenarios.	Research on citizen's needs in OOP service; Design of future OOP scenarios; Implementation of public services	Elaborated scenarios in different OOP domains and applicable for different procedures. Higher level of acceptance by citizens, citizen centric aspects is more in focus.	EU and national implementers, Academia

No	Scenario domains	Name of action	Description of action	Measures	Expected results	Responsible actors
CCA.4	Education; Moving	Engage citizens in OOP implementation process using different incentive approaches	Offering of bonus programs and/or discounts for other public services (e.g. temporary free parking in city), pilots of OOP services, organisation of competitions for "best feedback", with prizes for most active participating citizens, in order to entice willingness to be engaged in the process.	Active citizens engagement; Awareness raising to citizens	Improvement of OOP services since citizens' feedback and ideas can improve the offering, higher acceptance levels of OOP implementations, higher level of citizen engagement. Promotion of co-creation with citizens	OOP implementers; Citizens, NGOs
CCA.5	Education; Moving	Engage citizens into further mature OOP implementations	Organize a focus groups consisting of both end users and service providers, and involve them to requirements planning phase, to alpha or beta testing phase, etc.	Active citizens engagement; Awareness raising to citizens; Promotion of co-creation with citizens	Promotion of co-creation with citizens; Better understanding of the implementation processes, improvement of OOP services according to the citizens' feedback, higher acceptance levels of OOP implementations, more citizen oriented inputs.	OOP implementers; Citizens

3.2.11. Actions according to the data quality area

3.2.11.1.   Description of area and existing gaps

Data quality is a fundamental aspect to enrich the quality of the public sector services. Moreover, one of the most expected benefits of the OOP implementation is achieving the higher quality data in public sector.

One of the potential challenges in cross-border data exchange is to assure the quality of data. As data need to be mapped from one language, or one system (e.g. taxation or educational system) to another language or system, it should be some mechanism to check and recheck the quality of the mapped data.

3.2.11.2. Recommended actions

Table 12: Suggested actions on the data quality area

No	Scenario domains	Name of action	Description of action	Measures	Expected results	Responsible actors
DQA.1	Social protection;	Identify mandatory requirements for digital registries across EU (in the sense of data - not technical)	The necessary digital registries for holding needed data relevant to OOP solutions should be developed and fully productive in all Member States. What kind of data is needed for standard OOP services, what kind of requirements are needed?	EU-wide agreement on sharing data from digital registries signed by all MS and included in national digital strategies; Implementation of systems.	All data needed for the OOP implementation will be available in digital format in relevant registries	EU and national policy makers; Technology implementers
DQA.2	Taxation (T.5); Social protection (SP.9); Education (E.2, E.3)	Ensure data quality in cross-border data exchange	Data exchanged for cross-border services have to be based on seamless mapping service, code lists, common standards etc. to assure data quality. (compare different data requirements)	Research on standards and mapping services; Adoption of EU-wide data standards.	Assured quality of data exchanged across borders	EU and national policy makers; Standardisation bodies and experts on data standardisation; Experts in relevant fields (e.g. student bodies, teachers, professors, HEIs in the case of education data; doctors, hospital personnel, pharmacists, etc. in the case of health data, etc.).

No	Scenario domains	Name of action	Description of action	Measures	Expected results	Responsible actors
DQA.3	Education; Social protection; Taxation; Moving; Health	Ensure quality of new data	Provide training courses, video tutorials and detailed how to deal with data-to-data recorders e.g. front-desk employees.	Development of multilingual vocational training for data recorders	Enhanced quality of new data, i.e. every piece of data is correctly recorded from the start.	National policy makers, public officials and employees, VET practitioners
DQA.4	Education (E.9); Social protection (SP.8); Taxation (T.11)	Establish data quality assurance procedures	Ensure that data is recorded and maintained properly, through the implementation of system checks, scheduling data cleansing procedures and procedures for the manual approval of automatically mapped data.	Definition of data quality procedures; Enforcement of data quality procedures	Enhanced quality of OOP data	EU and national policy makers, data scientists, data mapping experts, business analysts, implementers, database owners and aggregators.

4. POLICY RECOMMENDATIONS

The results of tasks 4.1 - 4.3 finally fed into an activity to develop **policy recommendations** addressing policy makers at different levels, funding bodies and other relevant actors towards a necessary paradigm shift in the public sector and of citizens to implement the SCOOP4C. The policy recommendations are also formulated as policy brief and aim at **motivating and advancing the transformation** of the public sector towards once-only and digital by default solutions. The method for identifying and consolidating the policy recommendations were the same as for the roadmapping, i.e. discussions among project partners as well as with stakeholders and a validation workshop with the Steering board members (in combination with the verification workshop in task 4.3) in month 23 (Milestone 11). The policy recommendations are presented in the next subsection, while the insights from the online questionnaires are presented in subsection 4.2.

4.1. Policy recommendations

In the following, the policy recommendations will be presented for eleven areas of action, as follows

1. Political commitment
2. Legal interoperability
3. Organisational interoperability
4. Semantic interoperability
5. Technical interoperability
6. Interoperability governance
7. Motivation
8. Citizens centred
9. Trust and transparency
10. Data protection
11. Data quality

Policy recommendations are formulated regarding financial, legal and research requirements. The policy recommendations are based on the actions from the roadmaps as presented in chapter 3, and these are formulated for targeted actors. The full table with all policy recommendations is also available on the project website in a more accessible and user friendly form, with filtering options on different aspects – see https://scoop4c.eu/node/729.

4.1.1. Political commitment

	Policy recommendations	Actions from the roadmaps	Funding Requirements	Legal Requirements	Research Requirements
EU level policy and EU legislators	Development of a comprehensive political commitment – expressed by an elaborated SINGLE strategy to implement OOP as one main pillar of digitalisation, based on existing proposals and action plans (e.g. E-Government Action Plan 2016-2020) – best by anchoring it in the political government programme	PA.1, PA.2	Eventually funding of research activities to gain the basis for a strategy.		Research of existing good practices and meaningful cases for OOP – ideally for cross border services.
	Implementation of further digital services on EU level in order to enhance cross-border OOP implementation	PA.4	Provide funding for the research activities AND the implementation of cross-border digital services identified as drivers for OOP	If necessary – evaluate legal barriers for these digital services.	Research activities for the identification of potential cross-border digital services with added value based on OOP.
	Do not always try to lift all member states at the same time on the same level, but stimulate competition by building "coalitions of the willing" – policy of different speeds.		Encouraging by funding of innovative cross border policy initiatives – not only projects		

		Actions from the roadmaps	Funding Requirements	Legal Requirements	Research Requirements
National level policy and law makers	Clarification of competences needed for digitalisation by fostering OOP	PA.1	Funding required of the research activities to identify legal barriers. Organisation of Workshops with national policy makers and experts to identify common fields of OOP-based digitalisation interests.	Identification of legal barriers for OOP and creation of an digitalisation-friendly regulatory framework	Differential analysis to compare actual status quo and future targeted status under the perspective of maximal implementation of OOP
	Implementation of a so called "digital agenda" targeting on the integration of different registers, databases and services	PA.2, PA.3	Funding of the necessary expertise for setting up a digital agenda is required	No legal actions have to be taken for this action	Research activities - which can be based on the SCOOP4C and TOOP findings – are necessary to develop a conclusive "digital agenda" for
	Identification and implementation of outstanding "OOP for citizens pilots" on national level to reach more acceptance of the OOP-based digital services		Funding of investigation (first step) and implementation (2nd step) is definitely required.	Adapt national law to enable the "OOP for citizens pilots"	Investigations are required to identifiy services (ideally based on so called "living situations" with a positive impact for citizens by using the OOP to reduce administrative burden (Austrian example: "Digitales Amt" Services provided by App and Website for the completion of different "one-stop-shop"-services
	Implementation of further core digital services on national level in order to enhance OOP implementation	PA.4	Provide funding for the promotion of digitalisation and also implementation activities.	Adaption of law where required to realise the digital services	Research activities on the background of the targeted services possibly required

Overcome the trade-off between data protection and data openness (open government data)		Legal clarification of the requirements of data protection to not be a burden for OOP-based digitalisation.		Overwhelming data protection has the potential to eliminate or at least slow down the multi-use of personal data out of different sources.
If there is no general consensus on OOP-based services look for allies and start bilateral. It is better to start with a more narrow reach than to be slowed down.		Funding could encourage establishing alliances.	No legal requirements	No research required for this action.
Implement OOP in different national cases		Funding could be a motivation for a preferred implementation.	No legal actions need to be taken for this action	Research activities are imperative!
Involve all state levels (also regions, local authorities)		Funding could be helpful to support implementation of OOP (into IT-Systems of other – often independent – authorities)	Possibly legal adaptions required to enable OOP on different state levels (e.g. in Austria – country = region law)	Research activities are necessary to identify cross-state-level OOP-scenarios. to identify the demand of legal adaptions and also to identify the necessity of technical measures in participating authorities.

4.1.2. Legal interoperability

	Policy recommendations	Actions from the roadmaps	Funding Requirements	Legal Requirements	Research Requirements
EU level policy and law makers	Implementation of EU-legislation in order to provide meaningful (cross-border) data transfers including a clear organisational structure	LA.1	Provide financial resources to support the Member States in the harmonisation of national legislation	Implement directive or regulation (to the extent, that the EU has competence) in order to support the harmonisation of national legislation	Research activities to the extension of meaningful cross-border data transfer
	Clarification of OOP-requirements under the aspect of data protection law.		Funding of research (exploration of legal OOP-barriers) could be helpful.	Legal synchronisation on level of EU member states is necessary for cross border OOP	Data protection regulations are though the GDPR very different in the EU countries. Where some countries operate unique IDs for citizens (e.g. Estonia), other countries have defined legal and technical barriers to avoid cross sector data integration and data analyses (e.g. Austria)
	Implement a clear "roadmap of regulations" on EU level, but also with impact on national level	LA.6	Funding of research activities (see 1 line above)	Roadmap is thought as a connecting bracket over different legislative activities	Different legal regulations of EU-member states have to be analysed and compared in relation to their compatibility
	Development of guidance for a clear and sufficient decision-making power structures in order to overcome unclear responsibilities	LA.6	Provide financial support to the EU Member States in order to develop guidance	Implement directive or regulation (to the extent, that the EU has competence) in order to support the harmonisation of national legislation	Support the research activity on national level in order to define cross-border equipollent entities and procedures
	Encourage "good" competition by law between the member states.		Funding resources as motivation to participate	An European framework for national legal measures is required (see "roadmap of regulations")	No considerable research activities are required to encourage competition by law.

		Actions from the roadmaps	Funding Requirements	Legal Requirements	Research Requirements
National level policy and law makers	Implementation of harmonised national legislation in the EU Member States in order to provide meaningful (cross-border) data transfers including a clear organisational structure	LA.1, LA.3, LA.6	Provide financial support for the research activities in order that national legislation can be harmonised	Harmonisation/Amendment of national legislation in the EU Member States	Research activities to the extension of how national legislation can be harmonised to a sufficient degree in order that there can be meaningful data transfers including the identification of unclear organisational structures on national level and how to overcome it
	Development of guidance for a clear and sufficient decision-making power structures in order to overcome unclear responsibilities	LA.2, LA.4, LA.5, LA.6	Provide financial resources for the development and implementation of guidelines	Implementation of developed guidelines on national level (in line with GDPR) which clearly define responsibilities at different level	Research activities for the development of guidelines including the identification of a clear concept of national decision-making structures in order to overcome unclear responsibilities as a complementary document of the EU regulation

4.1.3. Organisational interoperability

	Policy recommendations	Actions from the roadmaps	Funding Requirements	Legal Requirements	Research Requirements
EU level policy and legislators	Creating digital learning agreements between EU universities	OA.10	Provide financial resources, in form of an EU-project, in order to create further bilateral digital learning agreements	No legal actions need to be taken for this action	Research and identify further bilateral digital learning agreements between EU universities with the participation of relevant actors

	Policy recommendations	Actions from the roadmaps	Funding Requirements	Legal Requirements	Research Requirements
	Establishing EU-wide reference processes for secure interaction and data exchange between different entities	OA.4, OA.7	Provide financial resources for the development and common agreement of EU-wide reference processes for secure data exchange		Invest in research to develop suitable methods and techniques for EU-wide reference processes, including process specifications in different official EU-languages
National level policy and law makers	Provision of information and services on national portals and information systems in at least two different languages (in addition to the SDG regulation)	OA.9	Provide funding, in form of several national projects, to provide needed information in at least two different languages	No legal actions need to be taken for this action	Provide information and services on national portals in at least two different languages in order to remove language barriers
	Creating digital learning agreements between national universities	OA.10	Provide financial resources, in form of a national project, in order to create further bilateral digital learning agreements	No legal actions need to be taken for this action	Research and identify further bilateral digital learning agreements between national universities with the participation of relevant actors
	Establish appropriate organizational structures for OOP implementations and including NCPs	OA.2, OA.8	Fund research on best suitable organisational structures for OOP implementations	Establish NCPs and other effective organisational structures with the necessary legal grounds.	Conduct research on best suitable organisational structures for OOP implementations.
	Establishing reference processes for secure interaction and data exchange between different entities in Member States	OA.4, OA.5	Provide financial resources for the development and common agreement of cross-border reference processes for secure data exchange		Invest in research to develop suitable methods and techniques for cross-border reference processes, including process specifications in different official EU-languages

4.1.4. Semantic interoperability

	Policy recommendations	Actions from the roadmaps	Funding Requirements	Legal Requirements	Research Requirements
EU level policy and legislators	Development and implementation of common EU-wide valid standards in order to overcome national differences and barriers and to enforce the adoption at member state level	SA.1, SA.2, SA.3, SA.4, SA.7	Provide funding for the creating and implementation of common standards within the EU	Implementation of common standards within the EU to enforce procedures' adoption at member state level	Research activities to investigate standard models and understand the current standards for each member state, in order to be able to create common standards within the EU which can be applied to all MS
	Encourage the development of an EU-wide ontology of basis-metadata (inventory)		Funding for the development is absolutely required – on EU-level (implementation of an expert group) but also on national level (national coordination)	Maybe a legal implementation (regulation)of a framework for such an ontology could be helpful.	In deep research is necessary to develop a valid and useful EU-wide ontology!
	Policy recommendations	**Actions from the roadmaps**	**Funding Requirements**	**Legal Requirements**	**Research Requirements**
National level policy and law makers	Implementation of common EU-wide standards (in order to overcome national differences and barriers and to enforce the adoption at member state level) – see recommendations on EU-level	SA.4	Provide funding for research activity and the implementation of an intelligent multilingual mapping service	Implementation of an intelligent multilingual mapping service which is in accordance with the EU requirements	Research intelligent mapping services for each respective domain on national level in order to be compatible for cross-border data exchange

4.1.5. Technical interoperability

	Policy recommendations	Actions from the roadmaps	Funding Requirements	Legal Requirements	Research Requirements
EU level policy and law makers	Implementation of EU-wide enablers and infrastructures to facilitate secure communication and payment for data exchanges between entities in different countries	TA.2, TA.3, TA.4	Provide financial resources for the identification of EU-wide enablers and infrastructures	Implementation of directive/regulation to assure secure EU-wide communication and to enforce the adoption at member state level	Research and identify possible EU-wide enablers and infrastructures to facilitate secure communication and payment

	Policy recommendations	Actions from the roadmaps	Funding Requirements	Legal Requirements	Research Requirements
National level policy and law makers	Implementation of the infrastructures mentioned above on national level	TA.1, TA.4	Provide financial support, in form of a national project, for the implementation of eID and the EU-wide ePayment	Amend national legislation in order to fulfil the requirements	Research and investigate what are needed to implement the eID according to eIDAS and conditions and requirements for an EU-wide ePayment system on national level
	Development and implementation of basic national registries in order to simplify digital data exchange	TA.5	Provide financial support, in form of national projects, for the development of basic registries	Amend/Implement national legislation in order to provide sufficient national registries in different domain	Research and identify possible basic registries in different domain in order to simplify digital data exchange

4.1.6. Interoperability governance

	Policy recommendations	Actions from the roadmaps	Funding Requirements	Legal Requirements	Research Requirements
EU level	Launch EU level projects and pilots for further establishment	IA.1	Provide financial resources, in form of an EU-project and furthermore pilots,	Based on the findings of the research, implement standards for	Research and identify possible EU-wide enablers and infrastructures

	of eInteraction building blocks for secure cross-border data exchange		for building eInteraction building blocks	the affected domains in order to further establish eInteraction	
	Implementation of EU-wide enablers and infrastructures on EU level (according to technical level)	IA.2, IA.3	Provide financial support for the member states in order to fully implement eID on national level	Implementation of directive/regulation to assure secure EU-wide communication and to enforce the adoption at member state level	Support/coordination the research activities on national level in order that the member states implement all components of eID
	Improvement of semantic interoperability and machine readability in order to use cross-border semantic assets	IA.4, IA.5	Provide financial funding for the interoperability and machine readability	Implementation of directive to assure improvement of semantic interoperability and machine readability	Research and identify the implementation of machine readability in order to improve semantic interoperability and identify cross-border guidelines for clear organisational, legal, semantic and technical solutions to increase sufficient capabilities
	Policy recommendations	**Actions from the roadmaps**	**Funding Requirements**	**Legal Requirements**	**Research Requirements**
National level policy and law makers	Implementation of interoperable infrastructures on national level (according to technical level)	IA.2, IA.3	Provide financial support, in form of a national project, for the implementation of eID	Amend national legislation in order to fulfil the requirements	Research and investigate what are needed to implement the eID according to eIDAS on national level and identify tools for authorisation of administrations and person
	Improvement of semantic interoperability and machine readability in order to use semantic assets	IA.4, IA.5	Provide financial funding for the interoperability and machine readability	Implementation into national legislation, which is in accordance of EU law	Research and identify the implementation of machine readability in order to improve semantic interoperability and identify national guidelines for clear organisational, legal, semantic and technical solutions to increase sufficient capabilities

4.1.7. Motivation

	Policy recommendations	Actions from the roadmaps	Funding Requirements	Legal Requirements	Research Requirements
EU level policy and law makers	Implementation of connected procedures within OOP scenarios and development of citizen-centred scenarios	MA.1, MA.3	Provide financial resources for the implementation of EU-wide connected procedures and the development of cross-border citizen-centred scenarios	Implement regulation in order to include further procedures and to have a legal basis for cross-border citizen-centred scenarios	Research activities on the EU-wide connections of related procedure for OOP future scenarios and research of citizen-centred scenarios
	Improvement of awareness raising on the positive impact of the once-only principle among citizens on EU level	MA.2	Provide funding for the awareness raising of the positive impacts of the (cross-border) OOP through seminars, workshops	No legal actions need to be taken for this action	Create a project group for a cross-border exchange of information
		Actions from the roadmaps	Funding Requirements	Legal Requirements	Research Requirements
National level policy and law makers	Implementation of connected procedures within OOP scenarios and development of citizen-centred scenarios	MA.1, MA.3	Provide financial resources for the implementation of connected national procedures and the development of national citizen-centred scenarios	Implement national legislation, which is in line with EU law, in order to implement further procedures and to have a legal basis for national citizen-centred scenarios	Research activities on member state level, in order to identify related procedures for OOP future scenarios Create national project groups for the research of citizen-centred scenarios
	Improvement of awareness raising on the positive impact of the once-only principle among citizens on national level	MA.2	Provide funding for the awareness raising of the positive impacts of national OOP through seminars, workshops	No legal actions need to be taken for this action	Create project groups on member state level, with the intention to inform citizens through workshops, seminars…

4.1.1. Citizen-centred

	Policy recommendations	Actions from the roadmaps	Funding Requirements	Legal Requirements	Research Requirements
EU level policy and law makers	Identification of citizen and special citizen groups needs by consulting citizen representatives in order to raise the acceptance level of OOP implementations	CCA.1, CCA.2	Provide financial resources for interactive sessions and workshops in order to identify citizen needs with the participation of representatives of citizen groups and to receive citizens' feedback	Implementation of an EU-wide regulation based on the findings of the research	Research the needs of citizens as well as needs of special citizen groups by involving the target groups in order to engage citizens in cross-border OOP implementations
	Implementation of transparent OOP services in order that citizens have control of their own data	CCA.3, CCA.4	Provide funding for the implementation of transparent cross-border OOP services in order to raise citizen satisfaction and acceptance of the OOP solutions including of an EU-wide secure payment system	GDPR is already in place, if necessary, stricter regulation concerning transparent OOP services needs to be implemented, including a reliable EU-wide secure payment system	Research activities on how cross-border OOP services can be transparent to assure that citizens have control of their own data and get notify in case of unusual access as well as research the requirements and possible barriers for the adoption of a universal payment system
	Policy recommendations	**Actions from the roadmaps**	**Funding Requirements**	**Legal Requirements**	**Research Requirements**
National level policy and law makers	Identification of citizen and special citizen groups needs by consulting citizen representatives in order to raise the acceptance level of OOP implementations	CCA.1, CCA.2	Provide financial resources for interactive sessions and workshops in order to identify citizen needs with the participation of representatives of citizen groups Provide financial resources for interactive sessions and workshops to receive citizens' feedback	Based on the findings, adapt national legislation in order to apply OOP in which the real needs of citizens are considered	Research the needs of citizen as well as needs of special citizen groups by involving the target groups in order to engage citizens on national level

Implementation of transparent OOP services in order that citizens have control of their own data	CCA.3, CCA.4	Provide funding for the implementation of transparent OOP services in order to raise citizen satisfaction and acceptance of the OOP solutions including of an EU-wide secure payment system	Implement national legislation, according to the GDPR, to ensure transparent OOP services including a reliable payment system	Research activities on how OOP services can be transparent to assure that citizens have control of their own data and get notify in case of unusual access as well as research the requirements and possible barriers for the adoption of a universal payment system
Legal implementation of citizen's right to demand from public agencies what information is registered on a person and free decision, which data are personally released for OOP-use		Funding should not be necessary if the measures are secured by law.	Legislation to implement this right is absolutely required	Research activities on data level are required – which data are used (and stored) for which transaction?
Implementation of a national portal where citizens can see all data stored about them (except data of justice or police that could threaten investigations)		Funding should not be necessary if the measures are secured by law.	Eventually clarification on behalf of a compatibility with GDPR and especially with national law is required	Research activities on data level (ontology etc.) are required

4.1.2. Trust and transparency

	Policy recommendations	Actions from the roadmaps	Funding Requirements	Legal Requirements	Research Requirements
EU level policy and law makers	Implementation of an EU-wide solution for the data subject's consent of data sharing including the right to withdraw it	TTA.1, TTA.4, OA.5, OA.6	Provide financial support for the research activities and the actual implementation	Implementation of corresponding EU-wide regulation for consent of data sharing which is in line with the GDPR	Research activities to identify appropriate solutions for the consent of data sharing and for the development of a clear concept
	Improvement of transparent procedures for access and use of personal data in the (cross-border) OOP implementations	TTA.2	Providing financial resources in order to implement cross-border transparent processes	Implement regulation, besides the GDPR, which regulates cross-border transparent processes	Research activities to identify transparent processes and how to implement them in order to lead to higher level of trust on the cross-border OOP solutions.
	Policy recommendations	**Actions from the roadmaps**	**Funding Requirements**	**Legal Requirements**	**Research Requirements**
National level policy and law makers	Implementation of a national solution for the data subject's consent of data sharing including the right to withdraw it	TTA.1, TTA.4, OA.5, OA.6	Provide financial support for the research activities and the actual implementation	Implementation of corresponding national legislation for consent of data sharing as well as the modification of national legislation, which is in accordance with the GDPR	Research activities to identify appropriate solutions for the consent of data sharing, including the right to withdraw it and for the development of a clear concept
	Improvement of transparent procedures for access and use of personal data in national OOP implementations including the awareness raising of such procedures	TTA.2, TTA.3	Providing financial resources in order to implement national transparent processes as well as for the provision of interactive sessions and workshops to inform citizens about transparent OOP implementation with participation of representatives of citizens	Implement national legislation, in accordance with the GDPR, which regulates national transparent processes	Research activities to identify transparent processes and how to implement them in order to lead to a higher level of trust on the cross-border OOP solutions

4.1.1. Data protection

	Policy recommendations	Actions from the roadmaps	Funding Requirements	Legal Requirements	Research Requirements
EU level policy and law makers	Implementation of the common data protection standards for cross-border data exchange	DPA.1	Financial support for the research activities to implement common data protection standards	GDPR is already in place to enforce adoption at member state level	Research activities to identify national common data protection standards (in accordance with the GDPR) for coherent cross-border data exchange
	Implementation of mandatory technical modules for any OOP (cross-border) services in order that citizens can give or withdraw their consent	DPA.2, DPA.3, DPA.4	Provide financial support for the implementation of technical solutions concerning mandatory modules for data sharing	Implementation of EU-wide legislation, based on the findings of the research, which is in line with the GDPR	Research activities for the implementation of technical solutions concerning mandatory modules for data sharing and to identify measures in order to avoid misuse of data
	Formulation of a clear understanding on European level on what has to be implemented in terms of data protection according to GPDR	DPA.5	Provide financial support of the research activities in order to receive a clear understanding	Adaptation of the GDPR based on the research activities	Research activities in the direction of how to harmonised the rules concerning a clear understanding
	Policy recommendations	Actions from the roadmaps	Funding Requirements	Legal Requirements	Research Requirements
National level policy and law makers	Implementation of the common data protection standards for national data exchange	DPA.1	Financial support for the research activities to implement common data protection standards	Implementation of GDPR on member states level	Research activities to identify national common data protection standards (in accordance with the GDPR) for coherent national data exchange
	Implementation of mandatory technical modules for any OOP (cross-border) services in order that citizens can give or withdraw their consent	DPA.2, DPA.3	Provide financial support for the implementation of technical solutions concerning mandatory modules for data sharing	Implementation/Modification of national legislation, which is in accordance with EU law, based on the findings of the research	Research activities for the implementation of technical solutions concerning the mandatory modules for data sharing

	Formulation of a clear understanding on national level on what has to be implemented in terms of data protection according to GPDR	DPA.5	Provide financial support of the research activities in order to receive a clear understanding	Implementation of the adapted GPDR	Research activities in the direction of how to harmonised the rules concerning a clear understanding on national level

4.1.2. Data quality

	Policy recommendations	Actions from the roadmaps	Funding Requirements	Legal Requirements	Research Requirements
EU level policy and law makers	Identification and implementation of measures for ensuring quality of (new) data in general and for cross-border data exchange	DQA.1, DQA.2	Provide funding for multiple cross-border projects for ensuring data quality and developing mandatory digital registries	Implementation of directive to assure the development of mandatory digital registries at member state level which leads to an increase of data quality	Research in the direction to identify measures for ensuring quality of new data in order that cross-border data is correctly recorded in mandatory digital registries
	Implementation of a common data quality procedure at EU level to enforce procedures' adoption at member state level	DQA.4	Provide funding for multiple cross-border projects in combination or based on the finding of DQL.2 for enhancing data quality procedures	Implementation of directive for a common data quality procedure at EU level to enforce procedures' adoption at member state level	Research activities in the identification of quality procedures on national level

	Policy recommendations	Actions from the roadmaps	Funding Requirements	Legal Requirements	Research Requirements
National level policy and law makers	Identification and implementation of measures for ensuring quality of (new) data in general and for domestic data exchange	DQA.1, DQA.3	Provide funding for multiple national projects for enhancing data quality and developing mandatory digital registries	Implement national legislation, which is in line with the GDPR and further EU law	Research in the direction to identify measures for ensuring quality of new data in order that data is correctly recorded in mandatory digital registries
	Implementation national legislation for a common data quality procedure at member state level	DQA.4	Provide funding for multiple national projects for enhancing data quality procedures	Implement national legislation, which is in line with the GDPR and further EU law, for establishing data quality procedures	Research activities on the identification of quality procedures on national level based on the study of DQA.3

4.2. Insights from the online questionnaires

This section presents the results of the roadmap questionnaires on four different domains. The questionnaires were developed according to the methodology described in section 2.2.3. It should be noted that the response to the questionnaires were not very high and for the taxation questionnaire there were no results that could be used further. Table 13 shows the numbers of responses and views. Most of the responses are not complete. In order to get more accurate outcomes, the respondents' inputs with at least two questions answered, were included to the analysis. At the end the following numbers were considered: 16 respondents in education domain, 8 respondents in healthcare domain, 5 entries in moving and 1 respondent in social protection domain. For the taxation domain, no computable inputs were provided. A total of 30 responses was analysed. The findings are documented subsequently.

Table 13. Online Questionnaire on Policy Recommendations: Overview of all responses per domain

	Incomplete responses	Full responses	Total	**Responses analysed in the questionnaire**
Education	157	11	168	**16**
Healthcare	33	6	39	**8**
Moving	16	3	19	**5**
Social Protection	7	1	8	**1**
Taxation	5	0	5	**0**

4.2.1. Education domain

Figure 10 provides an overview of stakeholder roles, which the 16 respondents in the education domain took in order to answer the questionnaire. Some of the respondents indicated multiple roles.
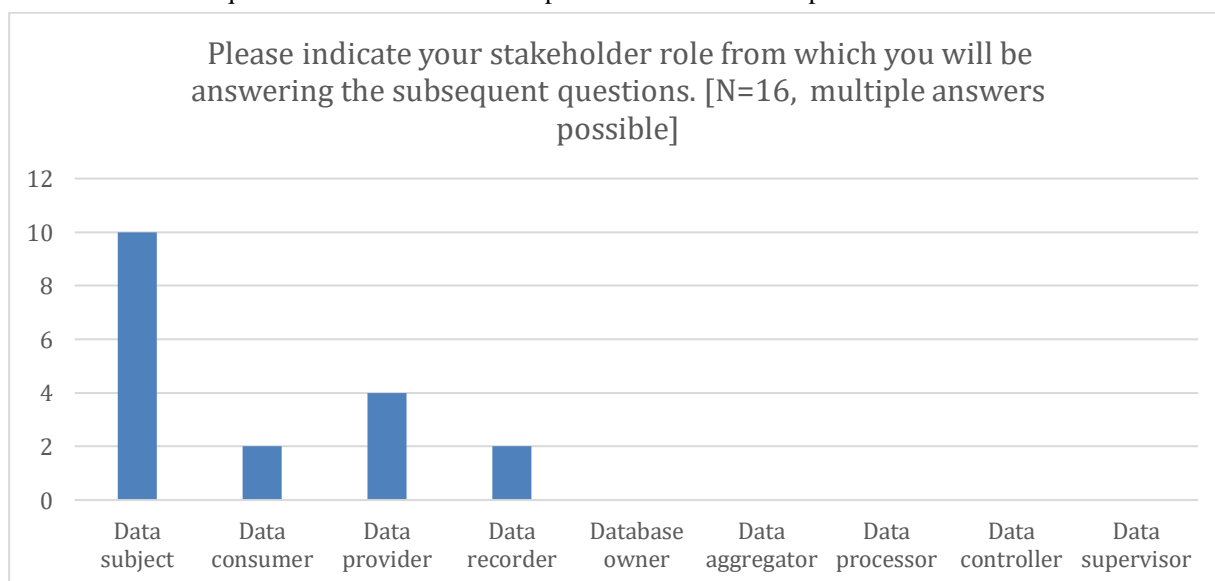

Figure 9: Overview of stakeholder roles of the 16 respondents in the education domain

Question 1 – Political commitment:

Statement: *Political commitment is a key challenge to realize the scenario. The lack of sufficient political commitment on national and European levels reduces the capacity of resolving most of the issues raised by the scenario.*

The answers of the respondents are presented in Figure 11. More than half of them argue solving the issue by demonstrating the benefits of OOP. Along with it, six of the participants are on the side of business to implement successful instances. At the same time one quarter supports the idea of providing the awareness via petitions and demonstration. One respondent argues that the EU *"should issue relevant directives"* to push the OOP (entry Other).

Furthermore, the respondents indicate who should be responsible to resolve the lack of political commitment – see Figure 12. More than a half of the respondents see on the one hand the "EU decision makers" and "National decision makers" to be responsible to overcome the political commitment gap, on the other hand they also see "University representatives" and "researchers" responsible for OOP implementation.
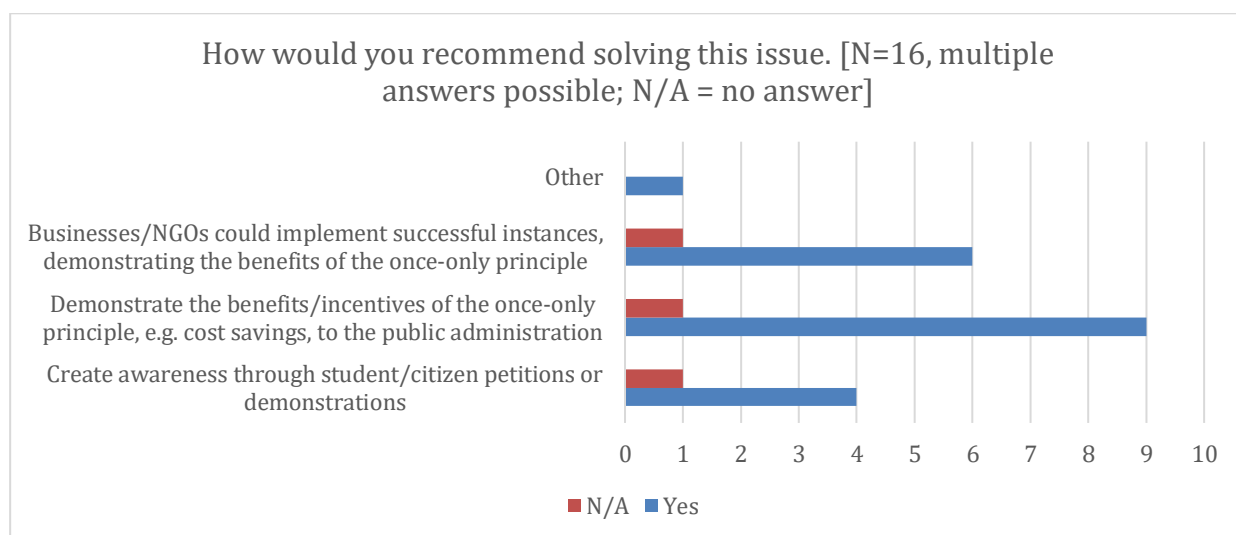

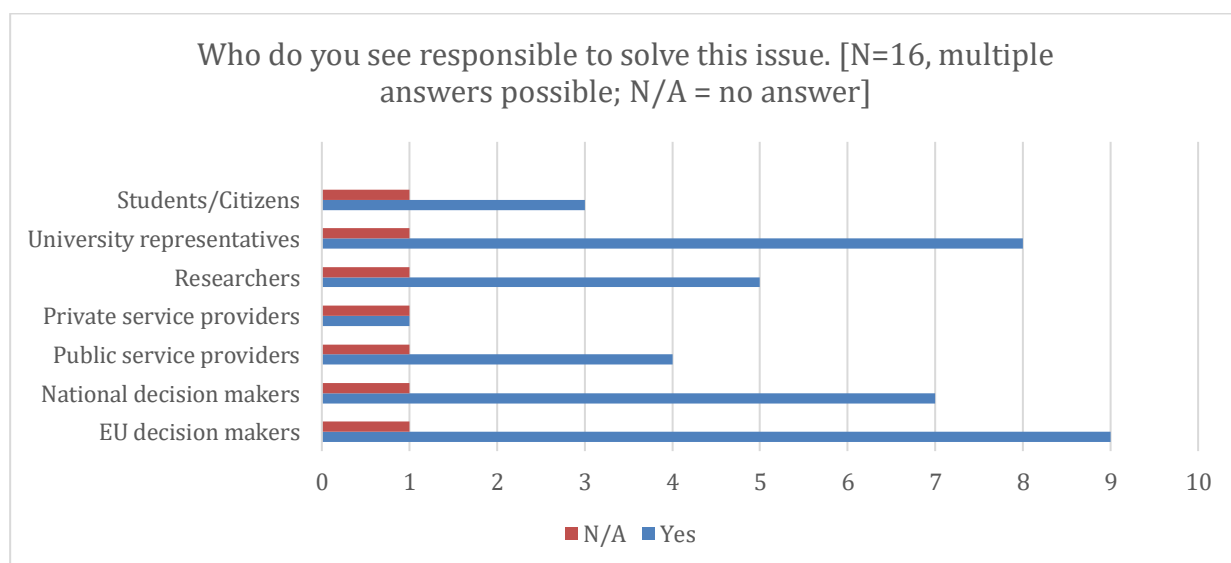**Figure 10: Perception of participants in regards to how the lack of political commitment should be overcome**

Figure 11: Perception of respondents in regards to who should contribute to overcome the lack of political commitment

Question 2 – eID issues

Statement: *eID is a key element in the presented scenario; however, existing eID solutions are not fully supporting the processes shown in the scenario, with the following caveats:*

- *Cross-border use of eID is not implemented across all member states*
- *Limitation of eID for covering educational information*
- *Absence of national eID in some member states*

Figure 13 illustrates that the half of respondents supported the enforcement of eIDAS implementation as possible solution of eID issues, whereas 5 survey participants see the "pressure on Member States" to be a solution. Moreover, in Figure 14 the majority of respondents suggest the "EU decision makers" and "National decision makers" to be the key actors that are responsible for solving the eID issues. Only two participants see "Public service providers" and "University representatives responsible" for eID implementation.
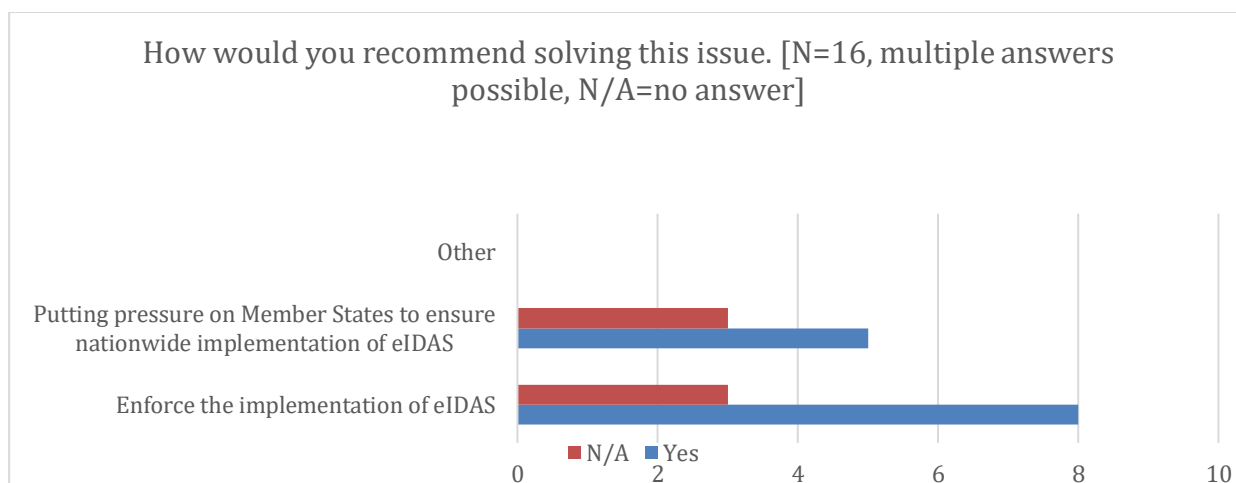

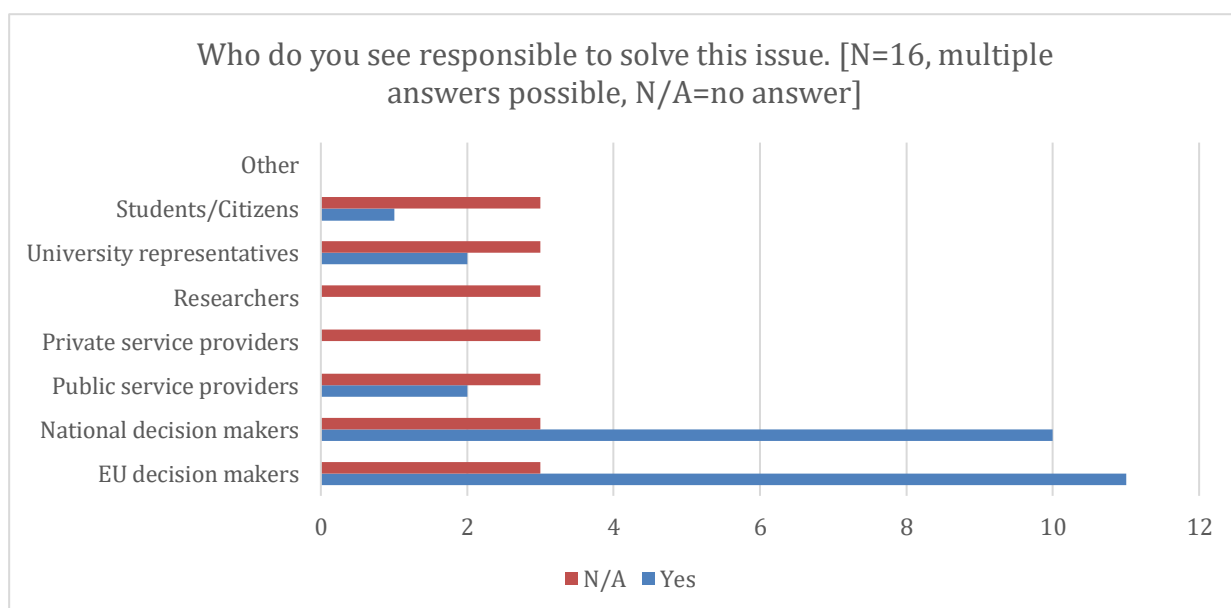**Figure 12: Perception of respondents in regards to how the eID issues should be solved**

Figure 13: Perception of respondents in regards to who should contribute to solve the eID issues.

Question 3 – Mapping of records

Statement: *To enable studying abroad and to provide a smooth processing of data such as transferring the student credits, mapping equivalent or similar learning resources along digital learning agreements requires a European-wide concept of harmonising and mapping learning resources. There is following issue:*

Lack of a clear concept and solution for mapping educational resources and data. A European ontology of educational resources is missing. This would be the basis for (semi)automatic transmission of e.g. transcripts of records.

Figure 15 illustrates that the harmonization of data standards around the EU Member States is the most presumable option to resolve the issue of the records mapping. However, pursuing of the different data standards and deliberating with stakeholders' engagement are also options for two and one respondent respectively.

At the same time, Figure 16 points out that majority of the respondents see "National" and "EU decision makers" as responsible actors for solving the mapping of educational data issue. "University representatives" and "Researchers" are the second most selectable choices and were selected as the answers 5 and 3 times respectively.
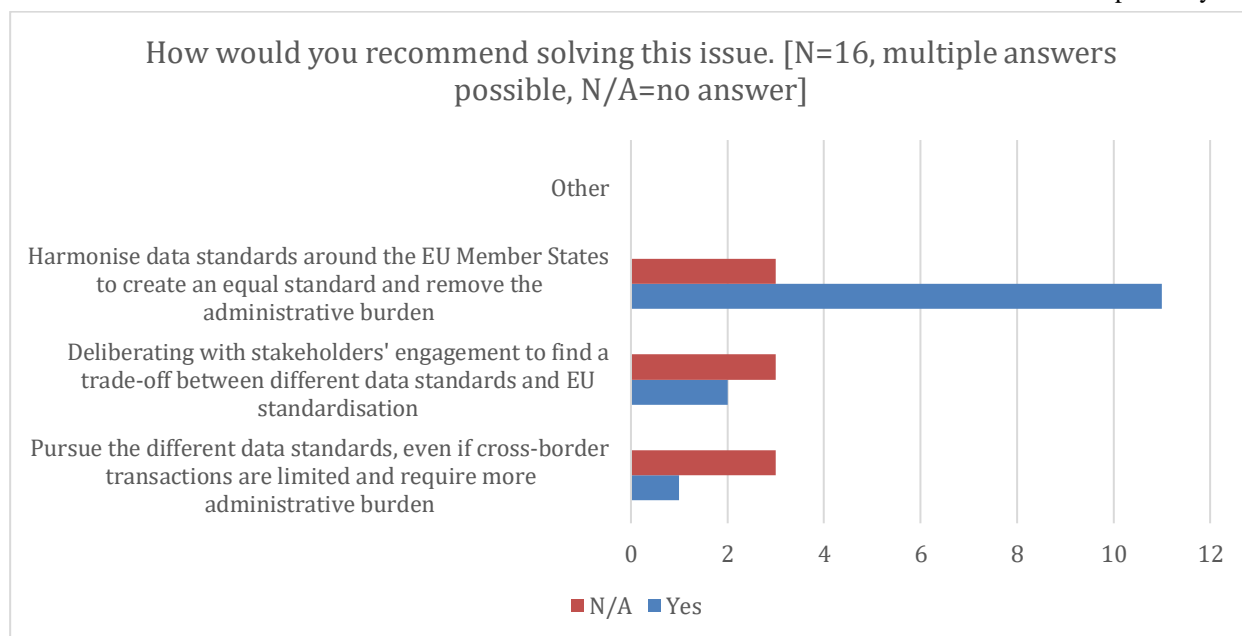

Figure 14: Perception of respondents in regards to how the issue of mapping of educational data should be solved
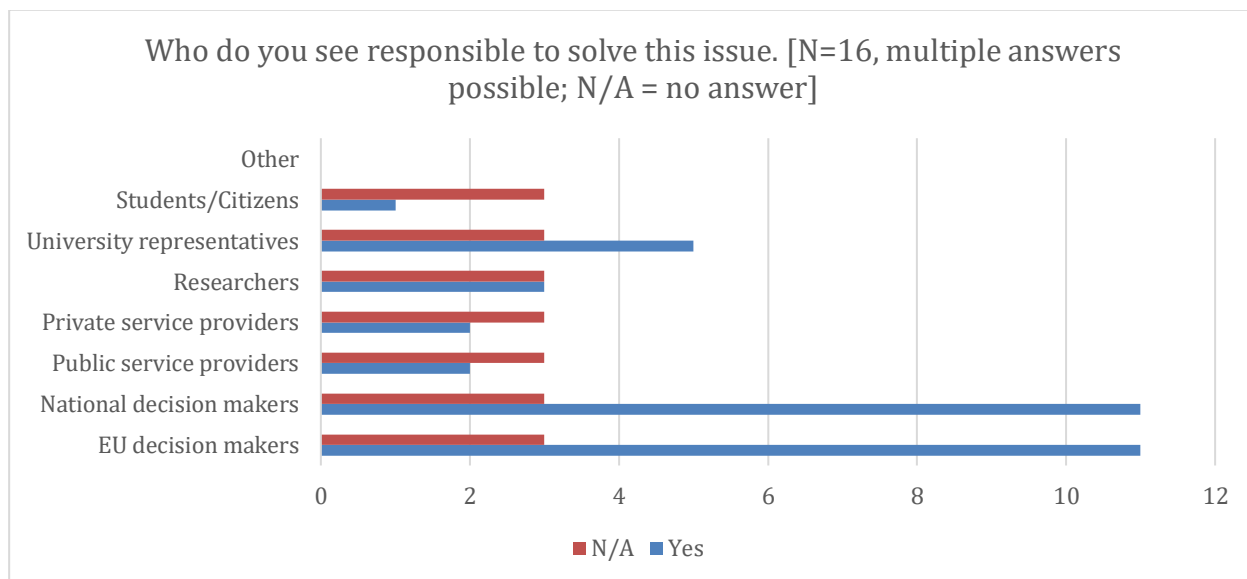
Figure 15: Perception of respondents in regards to who should contribute to overcome the lack of clear concepts and solution for mapping of students' transcript of records.

Question 4 - Technical interoperability

Statement: *Besides the political and eID barriers to successfully implement the OOP, the technical barriers are the most threatening. The scenario uses national and EU wide infrastructure and portals; however, at the moment, this symbiosis is rarely possible. The national portals often do not have the required interfaces and EU regulations are often implemented differently between Member States. The issues are:*

- *Lack of connection between local systems to the European OOP infrastructure*
- *Various implementations in different Member States responding to a single EU regulation*

Figure 17 indicates that the half of the participants have decided to choose the "creation of the unique EU portals all Member States can access" as the possible solution, whereas the "establishment of EU wide guidelines" was selected half as often.

According to respondents' opinion, Figure 18 outlines the "EU decision makers" as actors which could be responsible to solve the issue of technical interoperability. Less than the half of answers are indicating, that "National decision makers", "Researches" and "University representatives" can also play a role and support the process of the establishing the connection between local and EU OOP infrastructures.
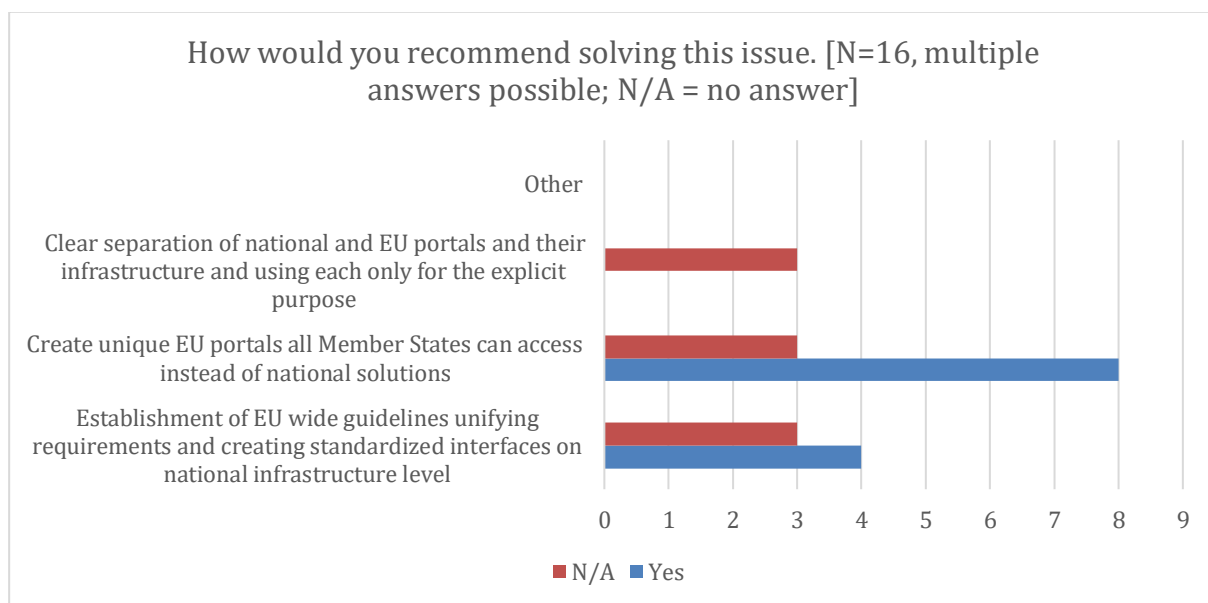
Figure 16: Perception of respondents in regards to how the issue of mapping of technical interoperability should be solved.
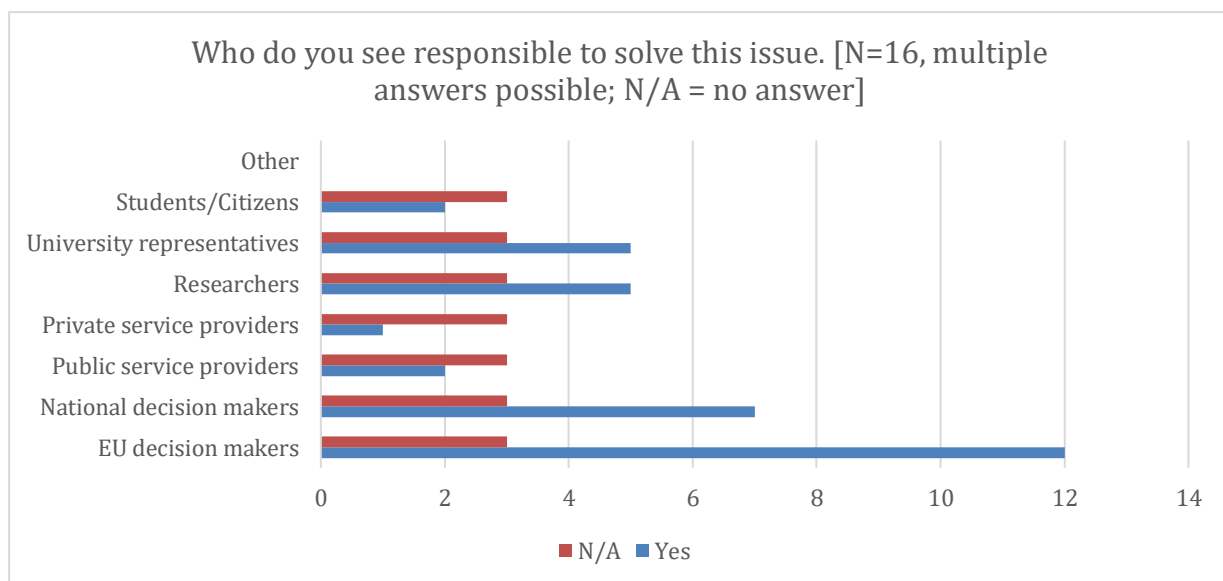

Figure 17: Perception of respondents in regards to who should contribute to overcome the lack of technical interoperability.

4.2.2. Health domain

Figure 19 provides an overview of stakeholder roles, which the eight respondents in the health domain took in order to answer the questionnaire. Some of the respondents may have indicated multiple roles.
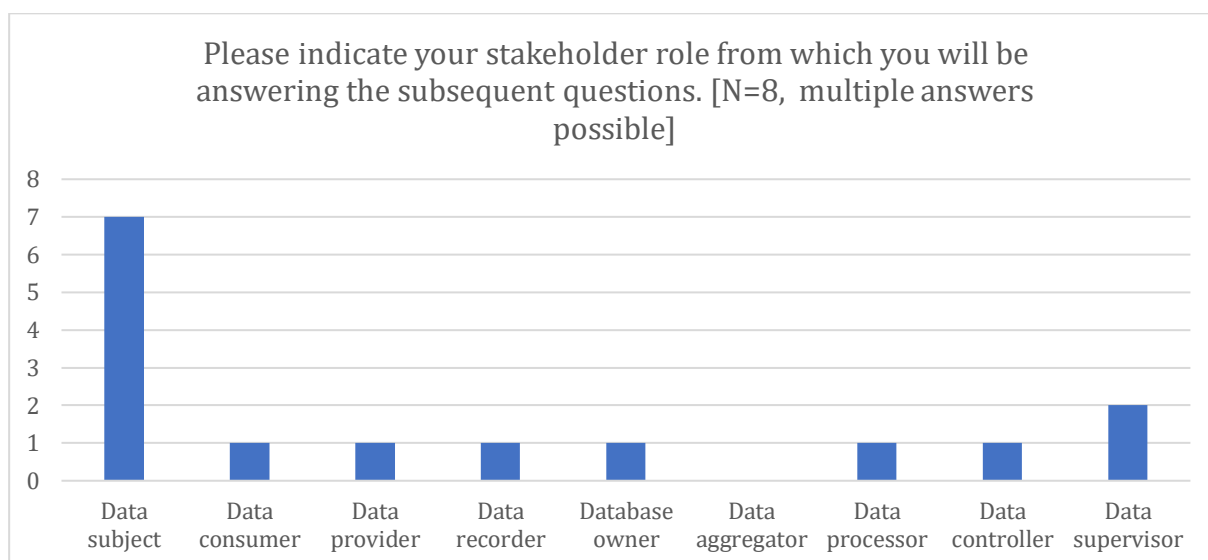

Figure 18: Overview of stakeholder roles of the eight respondents in the health domain

Question 1 – Political commitment

Statement: *Political commitments at both national and European level outline the importance of the OOP implementation in the health domain. However, lack of commitments at ministerial level could threaten the accurate implementation of the OOP in this scenario.*

Figure 20 shows that the half of the answers define the "coordination of activities on the EU and Member States level" along with "implementation of the successful instances for demonstration of OOP benefits" as essential steps to overcome the lack of political commitment. Quarter of respondents suggest the "demonstration of benefits and creation of awareness among medical personnel and citizens" as an approach to increase support of OOP in political landscape. One participant expressed an alternative opinion: "*Start* [implementation] *by redesigning, with focus on Citizen control –* [is] *not about "consent" to massive centralization*."

In Figure 21, the "EU decision makers", "public service providers" and "national decision makers" are suggested by respondents, as actors for playing a significant role in overcoming the lack of political commitment at ministerial level. "Researchers", "private service providers" and "medical personnel" are also considered as potential responsible actors, that could be responsible for strengthening the political commitment. Patients are the least probable solution but is also included in the answers.
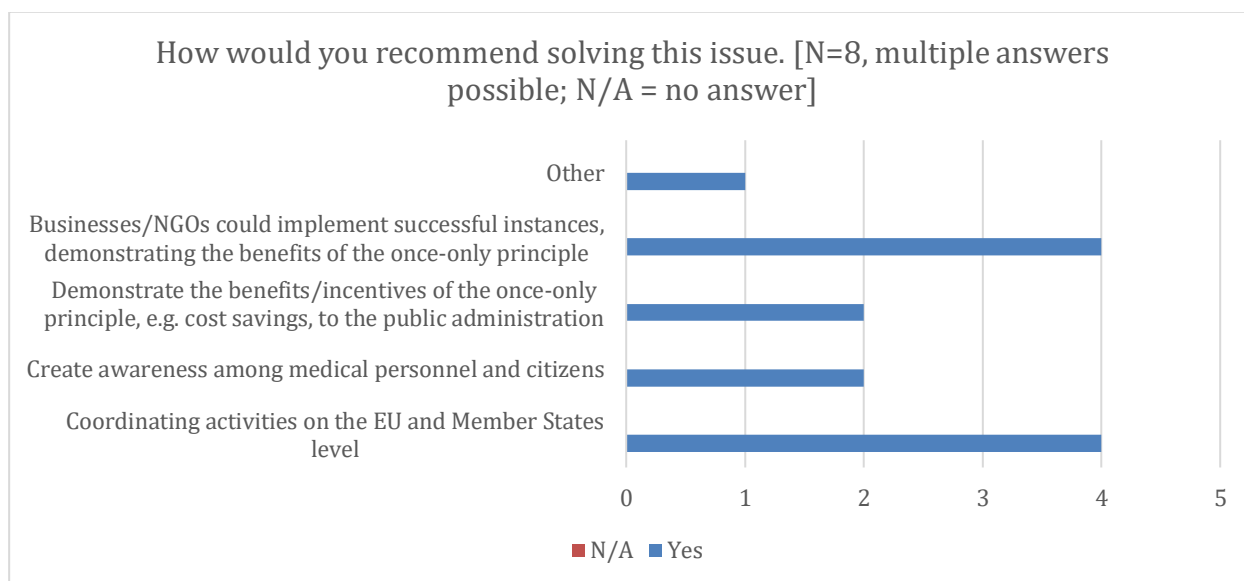
Figure 19: Perception of respondents in regards to how the issue of political commitment should be solved

Figure 20: Perception of respondents in regards to who should contribute to overcome the lack political commitment.

Question 2 – Interoperability governance

Statement: *Legal, semantic, organisational, and technical interoperability enablers are needed for seamless interoperability between different human and digital health actors. Yet, the lack of harmony between different interoperability enablers could threaten the OOP implementation in the healthcare.*

There are following issues:

- *Lack of Service Level Agreement (SLA)*
- *Lack of clear implementation guides of national and European legislation*
- *Lack of EU-wide regulation on insurance*
- *Different proficiency requirements for pharmacist among Member States*

- *Potential conflict between legal, semantic, organisational, and technical interoperability enablers*

In Figure 22, the "coordination of the activities on the EU and Member States level" is selected by the half of the total participants as potential activity for enhancing interoperability governance. "Implementation of successful instances by businesses/NGOs" and "creation of awareness among medical personnel and citizens" are two options that were pointed out by two respondents respectively. "Demonstration of the benefits of the once-only principle" was also indicated to be a presumable solution. One respondent provided following alternative view issue with following statement: "*This problem is an illusion - a consequence of bad design*".

Figure 23 reflects the vision of majority respondents, in such a manner that the "national" and "EU decision makers" are the most feasible actors that could influence the lack of SLA or EU wide regulation on insurance. In other hand "Public service providers" and "researchers" are perceived as responsible actors by the quarter of respondents. In addition, one participant stated the following opinion: "*Cancel the push for Command & Control Structures*".
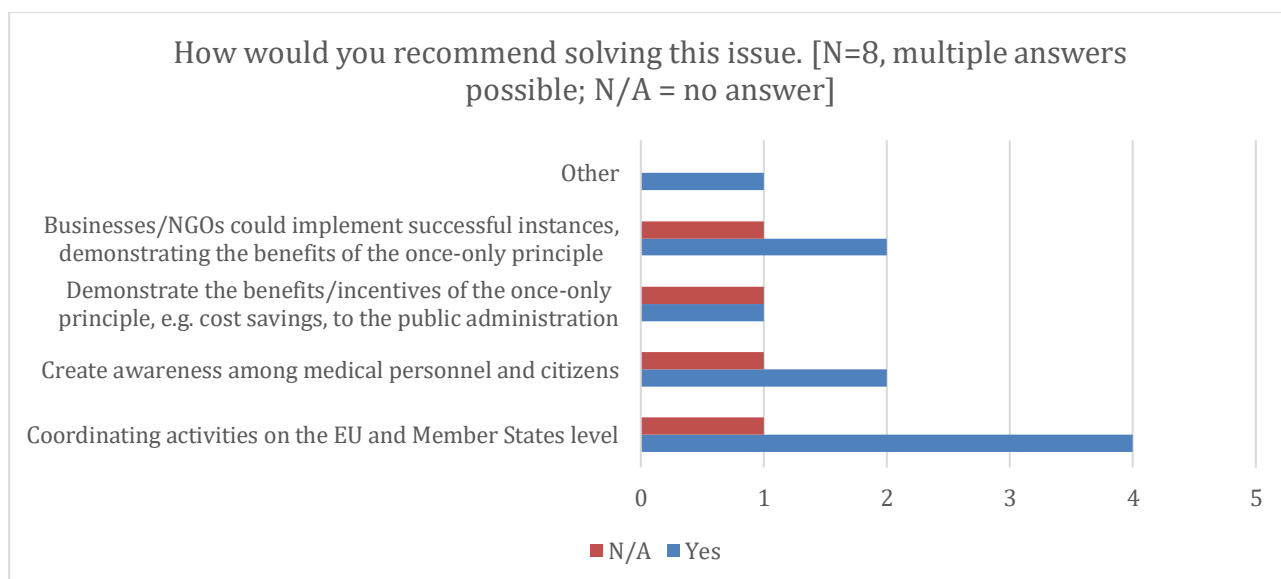
Figure 21: Perception of respondents in regards to how the issue of interoperability governance should be solved.

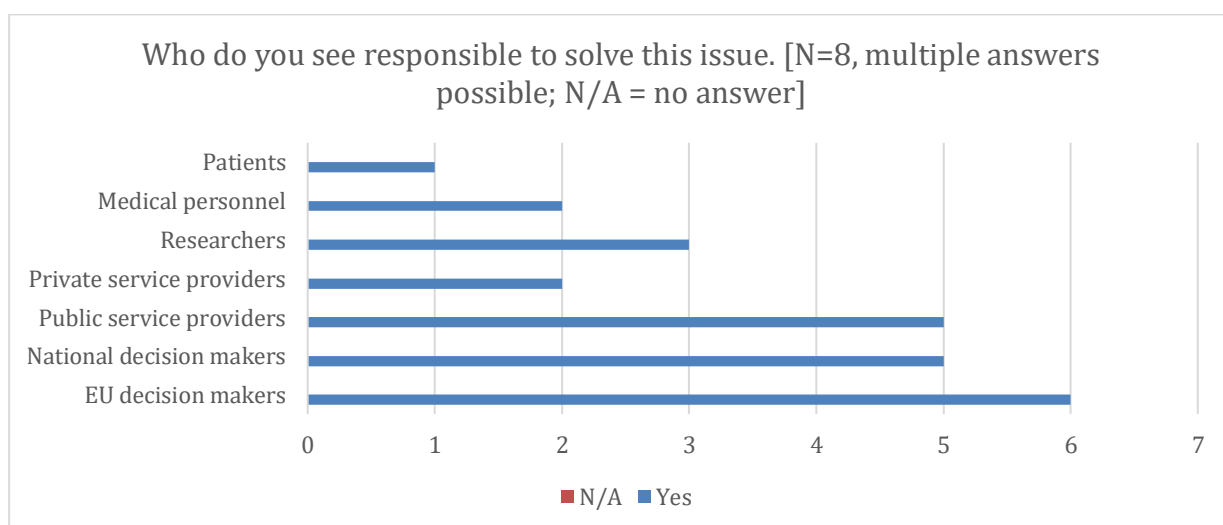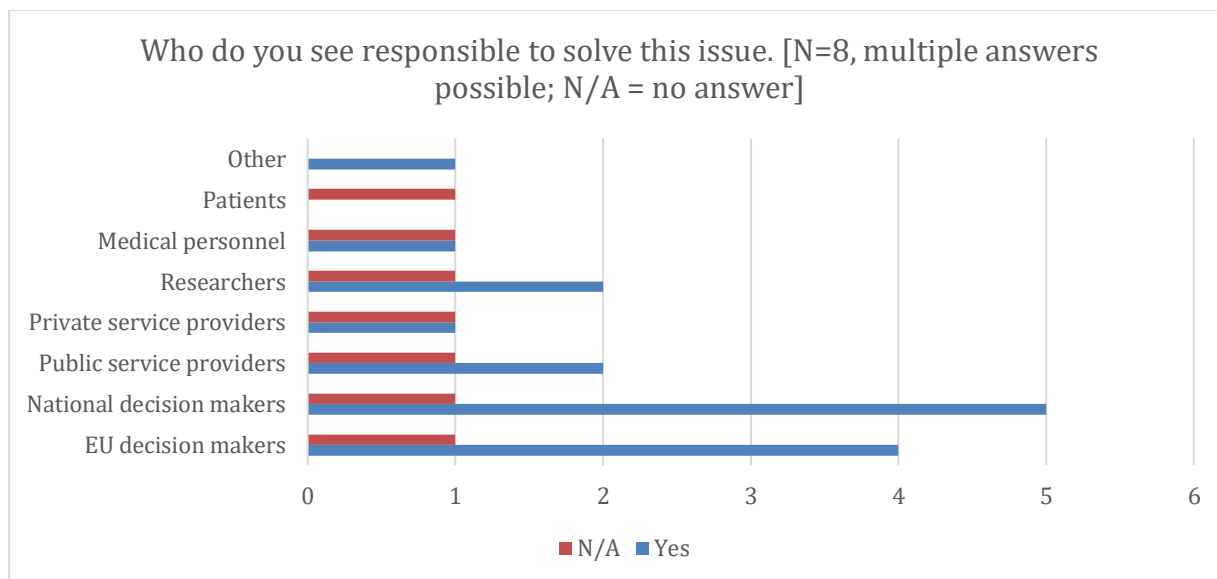**Figure 22: Perception of respondents in regards to who should contribute to overcome the lack interoperability governance.**

Question 3 – Ecosystem of eID and trust services

Statement: *Few member states have established all components of the PKI ecosystem (eID for persons, digital seal for organisations, issuing of certificates, security tokens, digital signature, timestamping, validation of certificates, Trust service list). The issue is following:*

Lack of essential infrastructure, including information systems and portals on national level.

Figure 24 shows that 50% of the responses are stating that "putting pressure on Member States" could be a solution for overcoming the lack infrastructure for eID implementation. "Fostering the full implementation of PKI ecosystems" and "agreement on accepting certificates", are seen by quarter of respondents as the possible activities to resolve the issue. Following statement: "*Design Id for Citizen Empowerment - PKI is design to control people.*" is mentioned as alternate assumption as well.

In Figure 25, the "EU decision makers" and "national decision makers" with the four votes, are considered for each actor to be the presumable responsible party in resolving the eID issues. On the second place are the public service providers with three votes, "private service providers and researchers" with two votes per each option.

How would you recommend solving this issue. [N=8, multiple answers possible; N/A = no answer]

Figure 23: Perception of respondents in regards to how the issue of lack of infrastructure for eID and trust services should be solved.

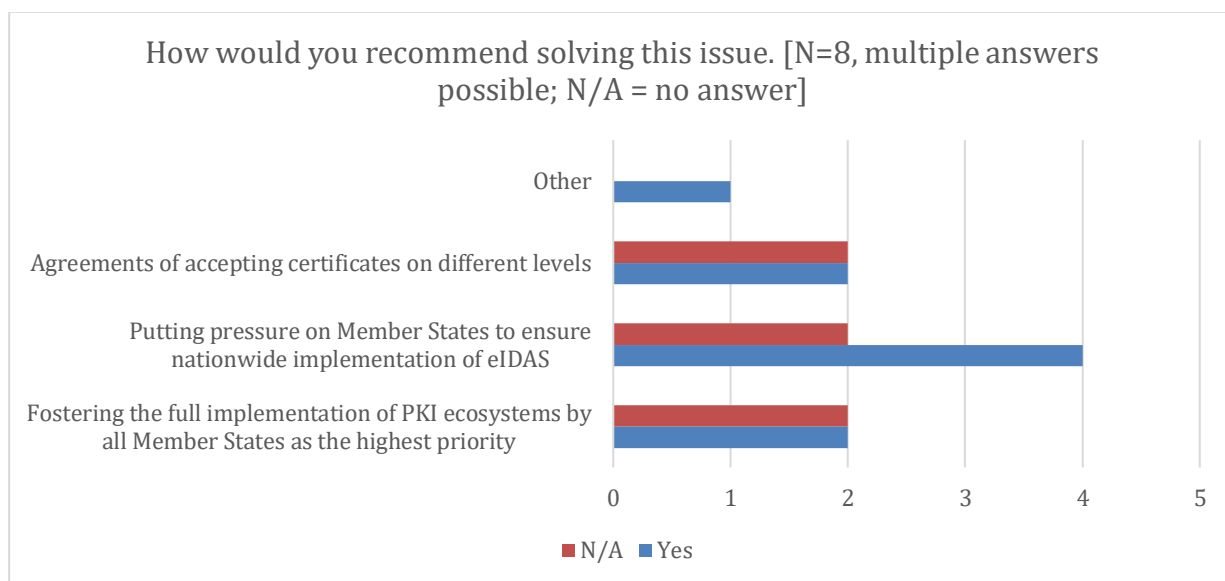Who do you see responsible to solve this issue. [N=8, multiple answers possible; N/A = no answer]
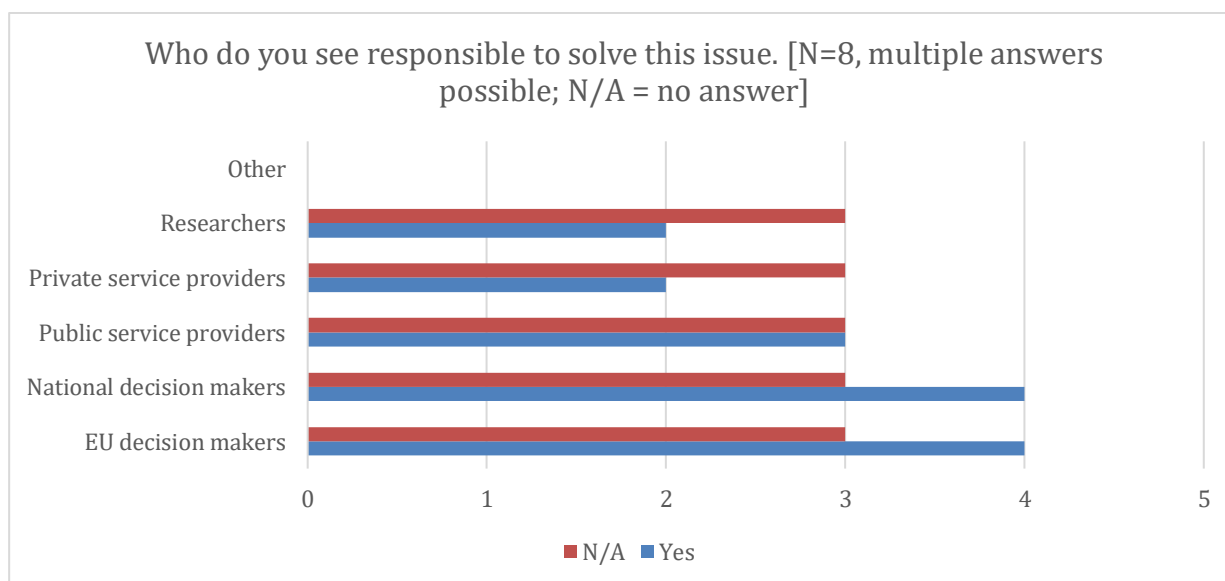
Figure 24: Perception of respondents in regards to who should contribute to overcome the lack infrastructure for eID and trust services.

Question 4 – Trust and transparency, data protection and privacy

Statement: *Patients should be able to see their up-to-date medical data as well as to check whom, when, and why they have given access to their personal and medical data. The data subject (patient) should be able to reject the doctors' and other data consumers' access to the patient's health information.*

- *Lack of possibility for citizens to limit access to their medical data*
- *Lack of a clear concept and solution for the consent of data subject for the data sharing*
- *Non-transparent use and access of citizens' data*
- *Lack of solution for data sharing consent in emergencies*

Figure 26 illustrates that half of the respondents are for the "establishing portals in member states" and "development of agreements and supporting legislation". "Development of tools for monitoring of data usage" is seen as the one of effective activities by three questionnaire participants. The alternative opinion is the following: "*Patients should have control of data - not merely "see their data" through the public surveillance systems*".

Furthermore, Figure 27 represents the "National decision makers" as the actors that could be most effective in decreasing the lack of trust and transparency in healthcare domain. On the other hand, "EU decision makers" are suggested to be the right instances, by the half of respondents.

Figure 25: Perception of respondents in regards to how the issue of trust and transparency, data protection and privacy should be solved.

SCOOP4C
STAKEHOLDER COMMUNITY
FOR ONCE-ONLY PRINCIPLE

Deliverable 4.2:
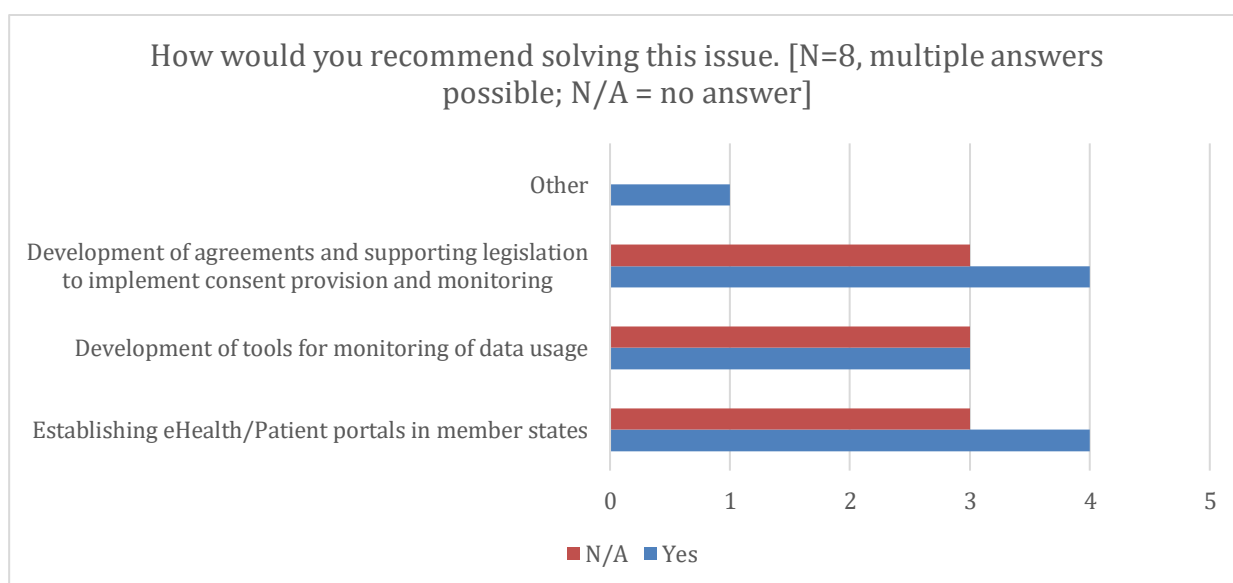Roadmap for future areas of actions, and policy recommendations
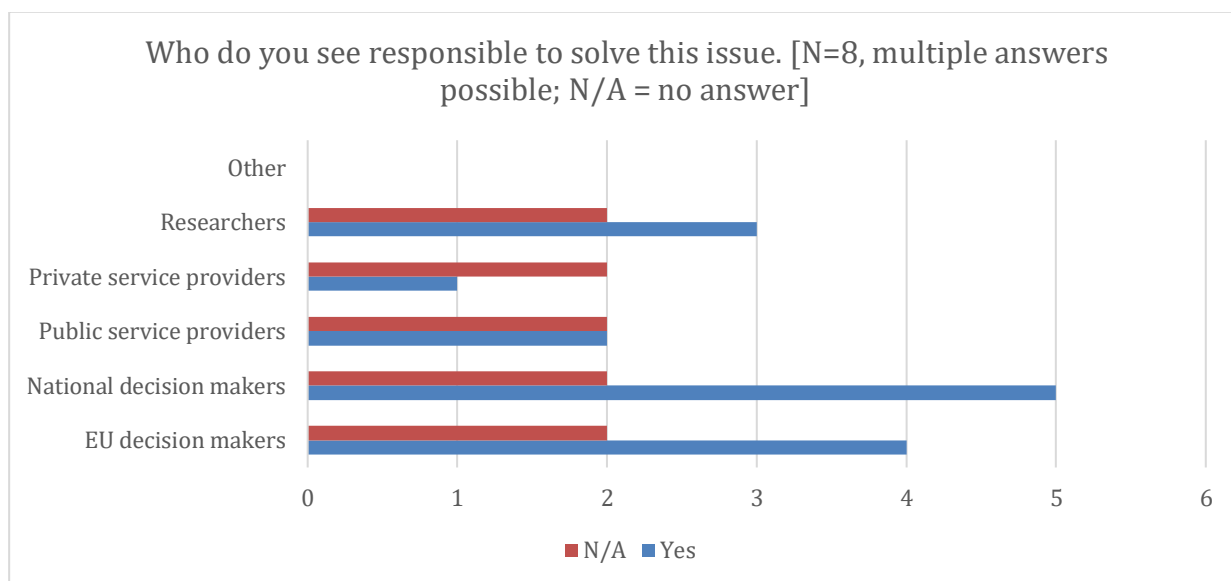Version 1.2
Date: 7th November 2019

Figure 26: Perception of respondents in regards to who should contribute to overcome the lack of trust and transparency, data protection and privacy.

Question 5 – Technical interoperability

Statement: *the scenario uses national and EU wide infrastructure and portals. The eDelivery solution for eHealth established at EU level does not support data exchange across several domains (tax, education, social protection, etc.).*

- *Lack of essential infrastructure, including information systems and portals on national level*
- *Lack of EU-wide e-Delivery building block in the health domain*
- *Uncertainties about technical stability*
- *Lack of solution for data sharing consent in emergencies*

In Figure 28, the responses are equally distributed between "implementation of EU level eDelivery solution" and "introduction of the interoperability between national and EU-wide data exchange systems" as an approaches to overcome the lack of essential infrastructure etc. Each answer received half of the participants' votes. "Termination of national data exchange systems in order to replace it with the EU level solution" is mentioned only once. None of the participants suggested "usage of bilateral agreements between Member States". One "Other" response is following: *"Data Portability - Citizen Centric Once-Only"*.

At the same time, Figure 29 represents the data about the suggestions on the responsible actors to solve the technical interoperability such as lack of EU wide eDelivery or uncertainties about technical stability. "National decision makers", "EU decision makers" and "public service providers" were mentioned by the majority of the respondents. Two participants indicate that the "researchers" are also the potential responsible actors that could be helpful in resolving the technical interoperability issues.

Figure 27: Perception of respondents in regards to how the issue of technical interoperability should be solved.

Figure 28: Perception of respondents in regards to who should contribute to overcome the lack of technical interoperability.

4.2.3. Moving

Figure 30 provides an overview of stakeholder roles, which the five respondents in moving took in order to answer the questionnaire. Some of the respondents may have indicated multiple roles.

Please indicate your stakeholder role from which you will be answering the subsequent questions, [N=5, multiple answers possible]
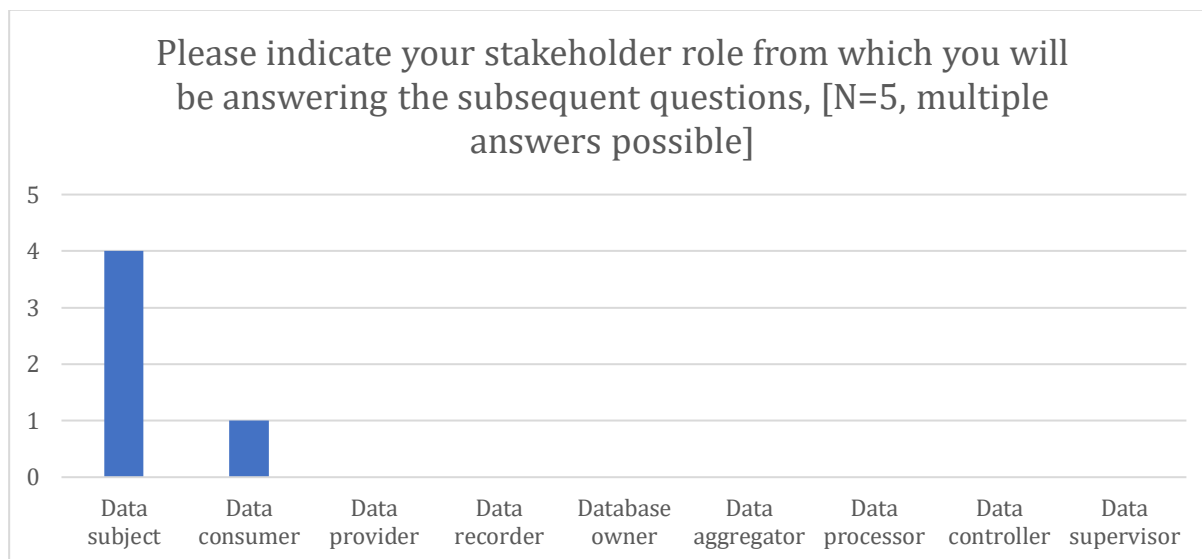
Figure 29: Overview of stakeholder roles of the five respondents in the moving domain.

Question 1 – Political commitment

Statement: *Motor vehicle registration problems are one of the main concerns addressed by the Single Digital Market strategy of the EC. To boost the OOP implementation in this area, more national political commitment is needed. While there is strong EU-wide and some national political commitments with emphasis on the importance of the OOP, the deficiency of sufficient political commitment on national and local levels could threat the seamless implementation of the OOP in this scenario.*

- *Lack of political commitment with focus on the moving domain on national level*
- *Lack of sufficient political commitment at national level*

In Figure 31, the more that the half of respondents accept "convincing decision makers on the relevance of the OOP implementation" and "persuading citizens on the positive impacts of the OOP implementation" as possible actions to strengthen political commitment. However, one respondent mentioned alternative solution as follows: "*I´m afraid it needs a combination of all these! But for me, the decision makers are most important, since they execute the OOP in this area.*"

In addition, Figure 16 illustrates that majority of the respondents see "National" and "EU decision makers" as responsible actors for to resolve the issues related to the lack of political commitment. "Public", "private service providers" and "citizens" are selected as potential responsible actors by one respondent.
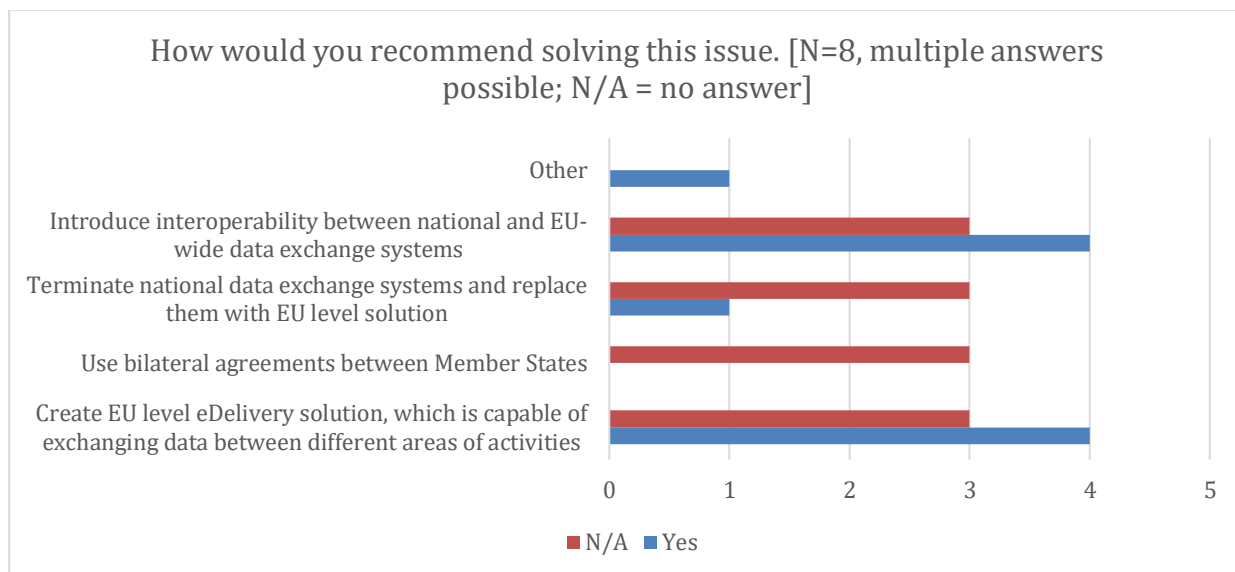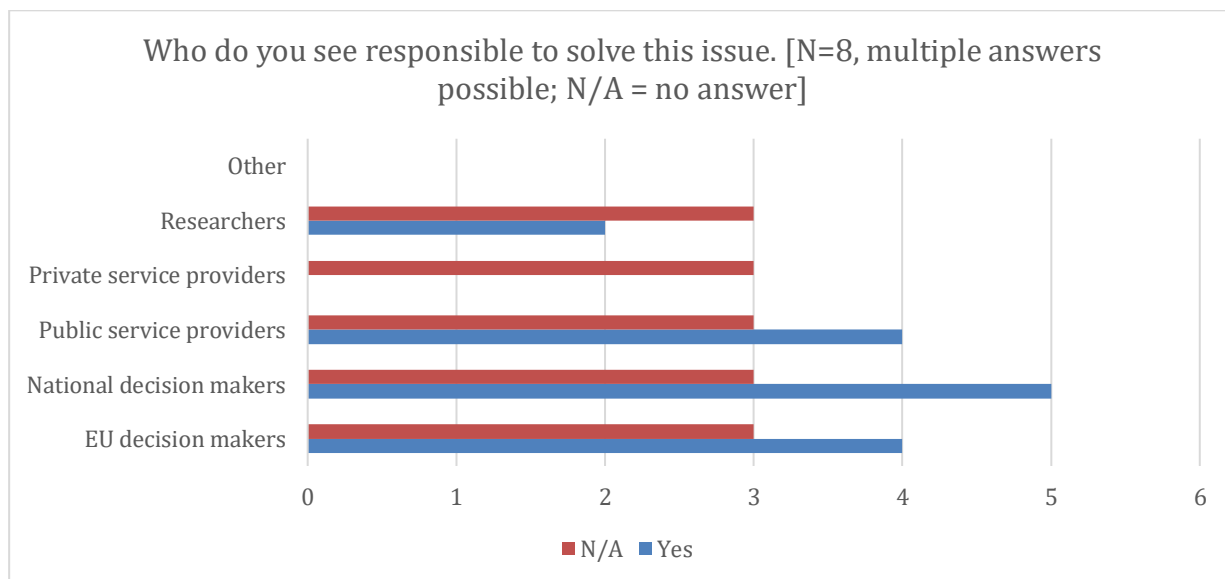
Figure 30: Perception of respondents in regards to how the issue of political commitment should be solved.
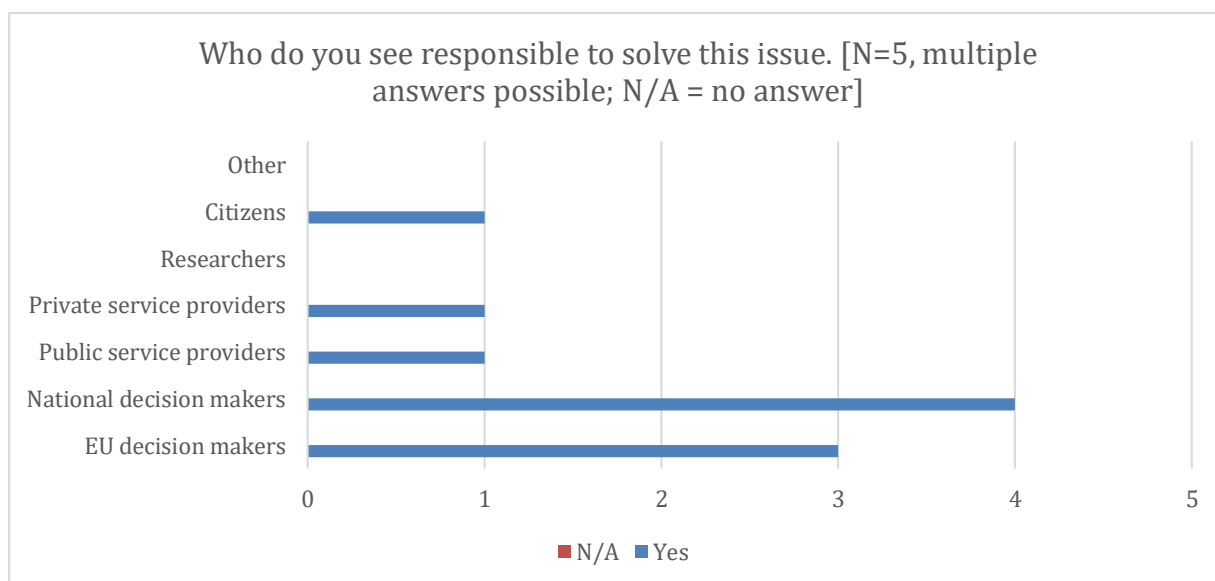
Figure 31: Perception of respondents in regards to who should contribute to overcome the lack political commitment.

Question 2 – Technical Interoperability: Cross-border use of eID

Statement: *While national eIDs are implemented in most of the Member States, national eID Schemes are in developing phase in Bulgaria, Cyprus, Czech Republic, France, Greece, Italy, Poland, and Romania. The issue is following:*

Absence of national eID.

Figure 33 represents the "enforcing cross-border usage of eID" and "implementation of the eID in the context of the unique identification on EU level" as activities that could be seen by respondents as solution for ubiquitous application of eID at national level.

At the same time, in Figure 34 the most of the survey participants suggest the "EU decision makers" and "National decision makers" are considered as the only actors to be capable to overcome the absence of national eID implementation.
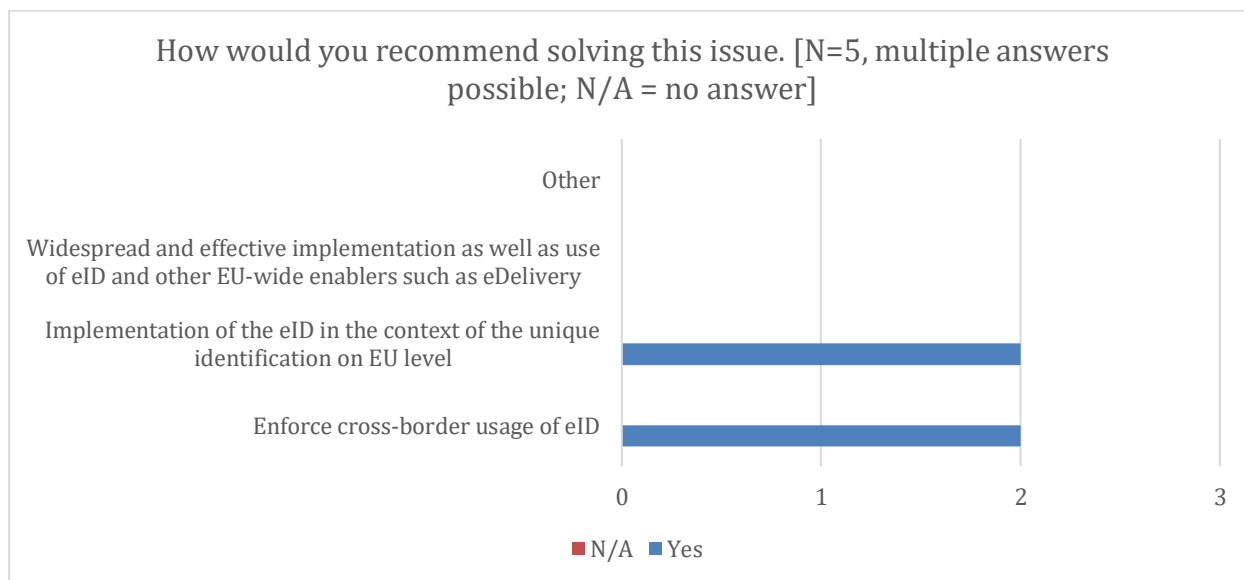
Figure 32: Perception of respondents in regards to how the issue of technical interoperability (cross-border use of eID) should be solved.
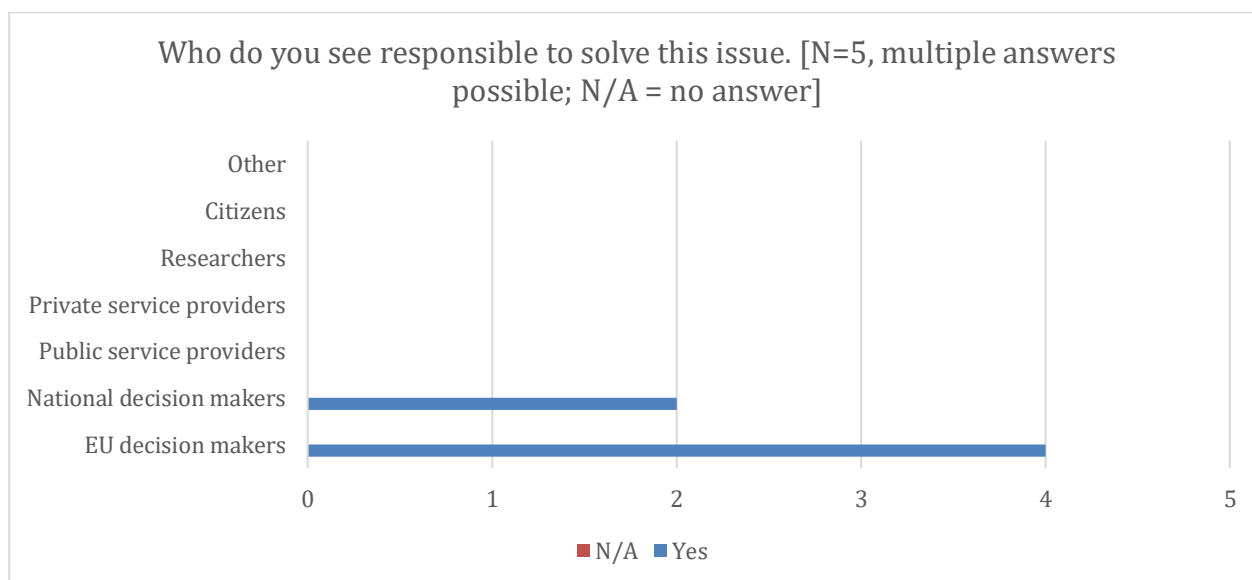
Figure 33: Perception of respondents in regards to who should contribute to overcome the lack of technical interoperability (cross-border use of eID).

Question 3 – Citizen-centred design

Statement: *Missing knowledge about the real needs of the individuals in the moving domain could leads to inaccurate design and implementation as well as less acceptance of the service by citizens as end users. Especially the specific needs of the disabled citizens are not facilitated by current infrastructures. Consequently, they cannot*

participate in this scenario. For instance, portals do not facilitate use of people with visual impairments. Namely, there are following issues:

- *Not sufficient consideration of the real needs of the citizens*
- *Non-sufficient service for people with disabilities*

Figure 35 in one hand points out that options such as "increase the use of agile methods to open up possibilities for redesigning once-only processes" and "enhance user research as first steps of service design processes" are seen to be a potential approaches to focus the OOP solution on citizens' needs, by more than the half of respondents. In another hand "including citizens with disabilities in service design processes" is the next important step for implementing the citizen-centric OOP solution.

Additionally, Figure 36 highlights the "public service providers" as the most preferred actor to support the citizen-centricity in OOP applications. However, "EU decision makers", "private service providers" and "researchers" are accepted as key players by almost half of the respondents.
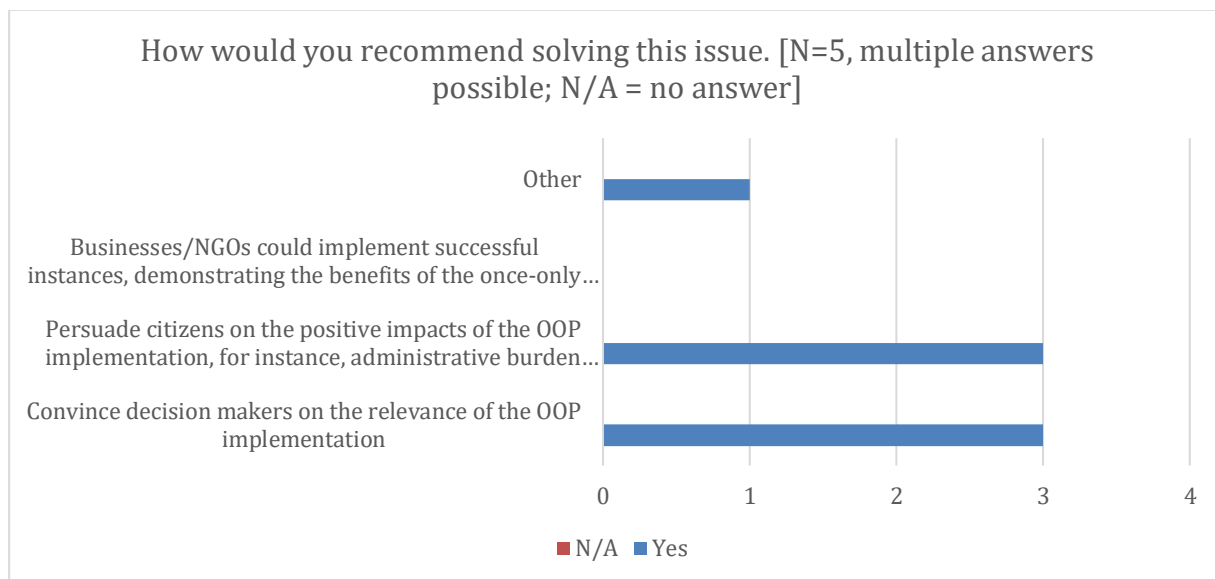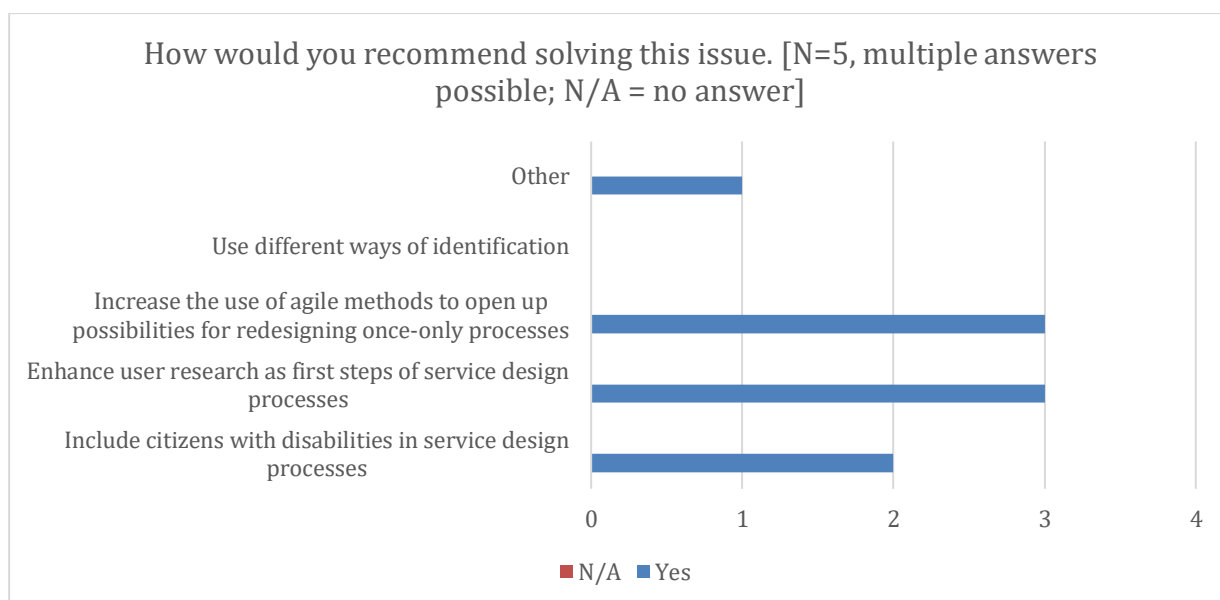

Figure 34: Perception of respondents in regards to how the issue of citizen-centred design should be solved.

Figure 35: Perception of respondents in regards to who should contribute to overcome the lack of citizen-centred design

Question 4 – Legal interoperability

Statement: *An EU level agreement on compensations in case of accidents and a legal basis for court cases could be helpful for further development of the scenario. These are hampered by the different socio-economic levels of the different EU Member States. Currently, there are many car insurances with different tariffs from one Member State to others. EU-wide legislation is necessary to harmonise different aspects of car insurance including tariff. While this shortage does not threat implementation of the scenario outlined, it presents a crucial motivation for more development of the scenario.*

- *Lack of EU agreement on compensations in case of accidents*
- *Lack of EU regulation for harmonising car's insurance*
- *Lack of legal interoperability and regulation on national and EU level*

In Figure 37, two respondents see "harmonization of tariffs of car insurance and what services or compensations are covered in case of accidents" and one respondent indicates "opening up possibilities for cross-border car tariffs" as solutions to overcome the lack of legal interoperability at national and EU levels. In addition, one respondent expressed following opinion: "*Insurance companies are probably very different across the EU. For convenience reasons, maybe it would at first be best to make the insurance companies offer cross-border tariffs.*"

Figure 38, indicates that majority of respondents prefer "national decision makers" and "EU decision makers" as key actors to resolve the legal interoperability issues in across EU. However, "private service providers" are less preferred option to be considered as key player.

How would you recommend solving this issue. [N=5, multiple answers possible; N/A = no answer]

Figure 36: Perception of respondents in regards to how the issue of legal interoperability should be solved.

Who do you see responsible to solve this issue. [N=5, multiple answers possible; N/A = no answer]

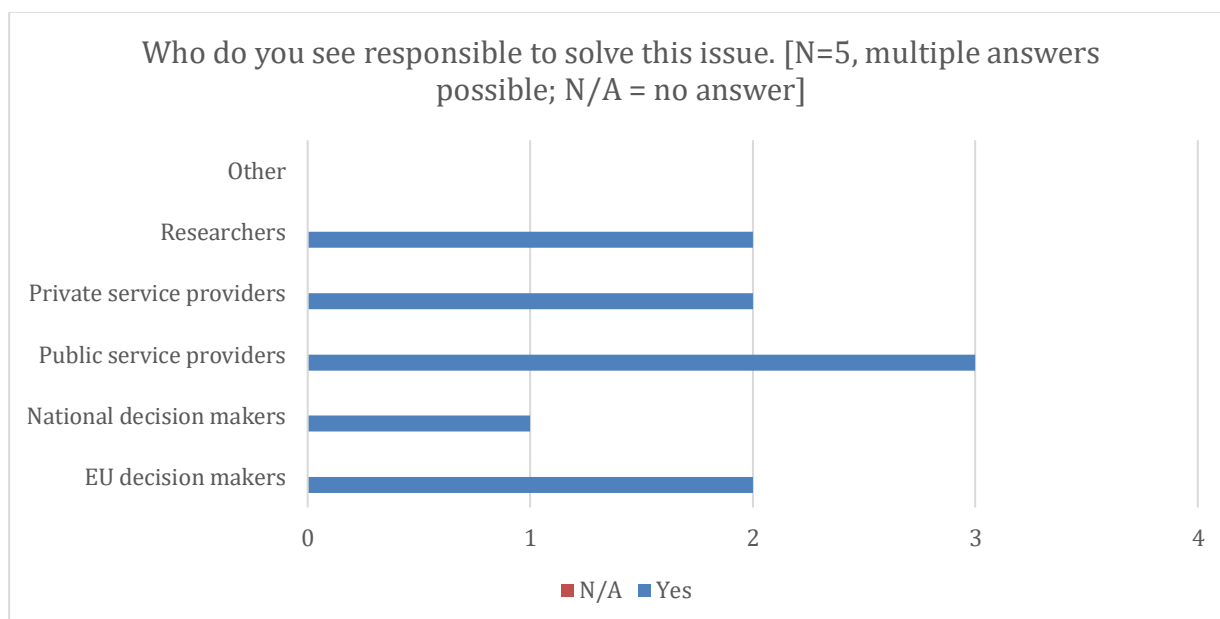**Figure 37: Perception of respondents in regards to who should contribute to overcome the lack of legal interoperability.**

Question 5 – Trust and transparency

Statement: *Transparency is an essential issue in order to accept a public service. This needs political commitments, and regulations to ensure legal interoperability as well as technical infrastructures that facilitate them. Data subjects should have the possibility to know what data is exchanged (either on domestic or EU level), by whom and what additional data will be stored along a public service. However, current services do not cover this issue.*

- *Missing transparency on access and use of sensitive data*
- *Lack of possibility for data subject to see which data is transferred or will be stored*

Figure 39 indicates that the only possible option provided in the questionnaire was chosen by three respondents as potential solution for overcoming lack of transparency on accessing and using the sensitive data. In addition, one of the respondents expressed the following idea: *"I'm not sure if this is not already possible with GDPR? However, one would probably have to ask every single institution/office/company who processed his/her data."*

At the same time, Figure 40 highlights "national decision makers" as a major actor for majority of respondents for providing more transparency in OOP implementation. In parallel, "private" and "public service providers" as well as "researchers" are equally important in terms of gaining more citizens trust in OOP.
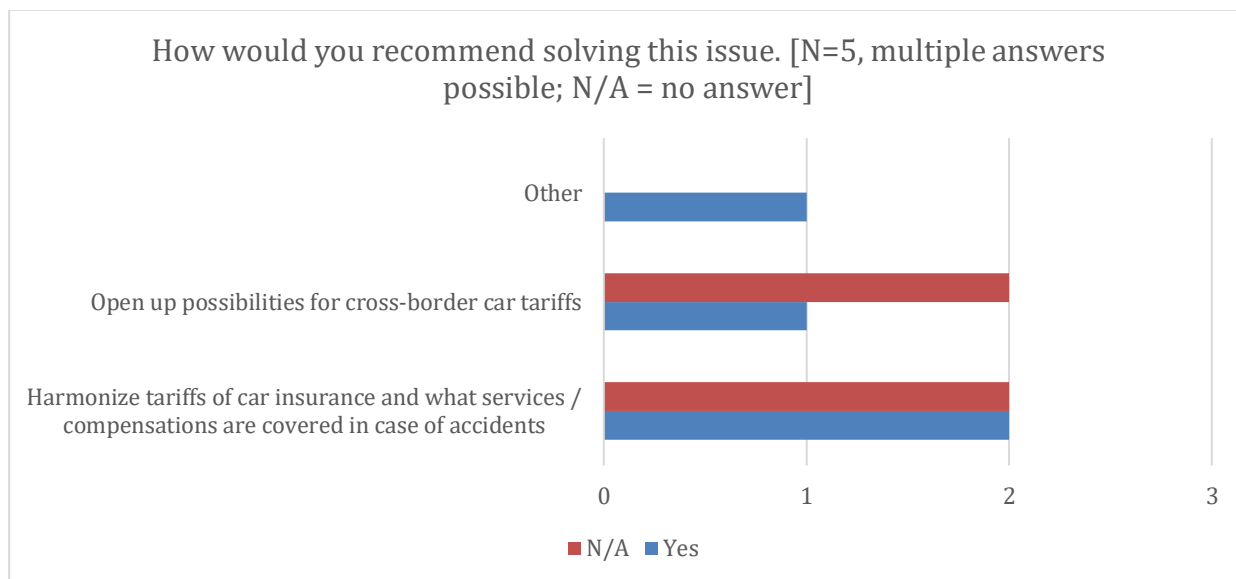

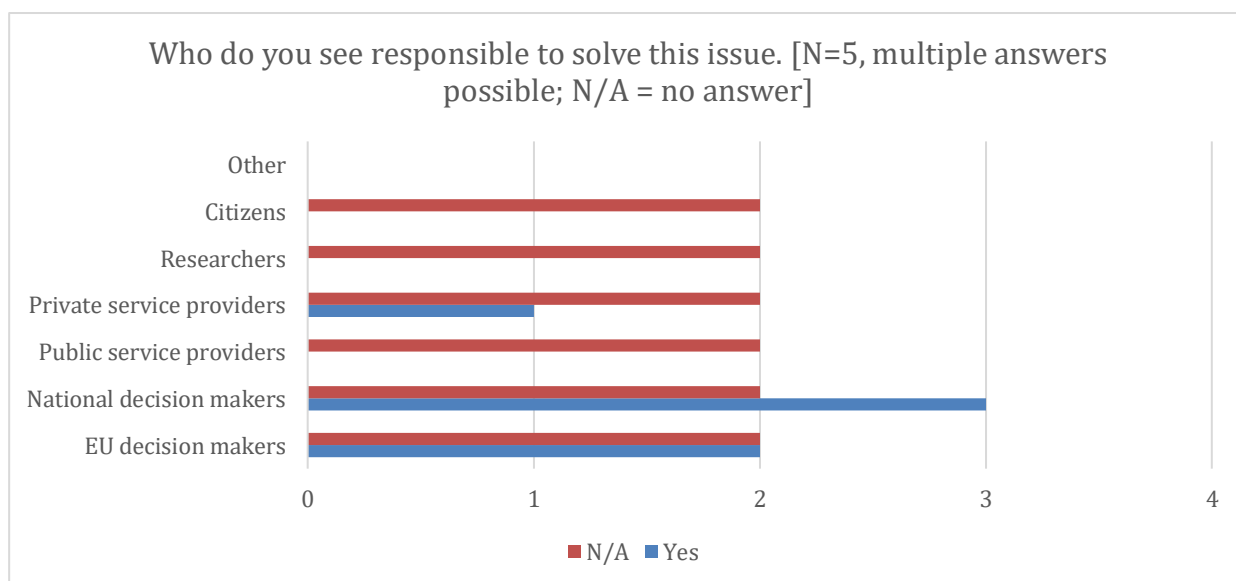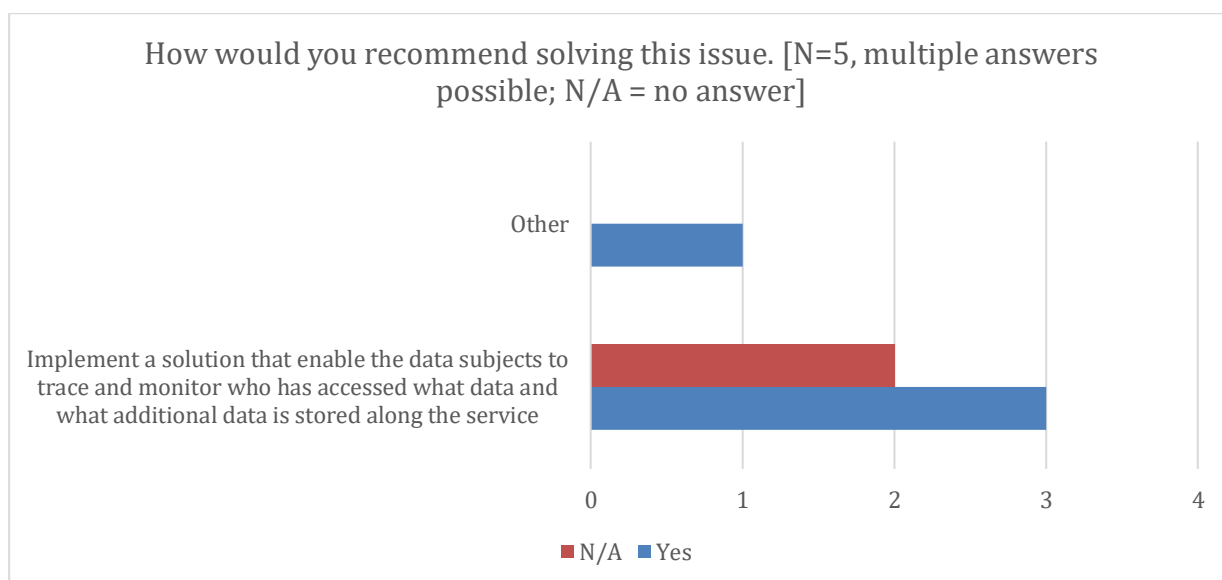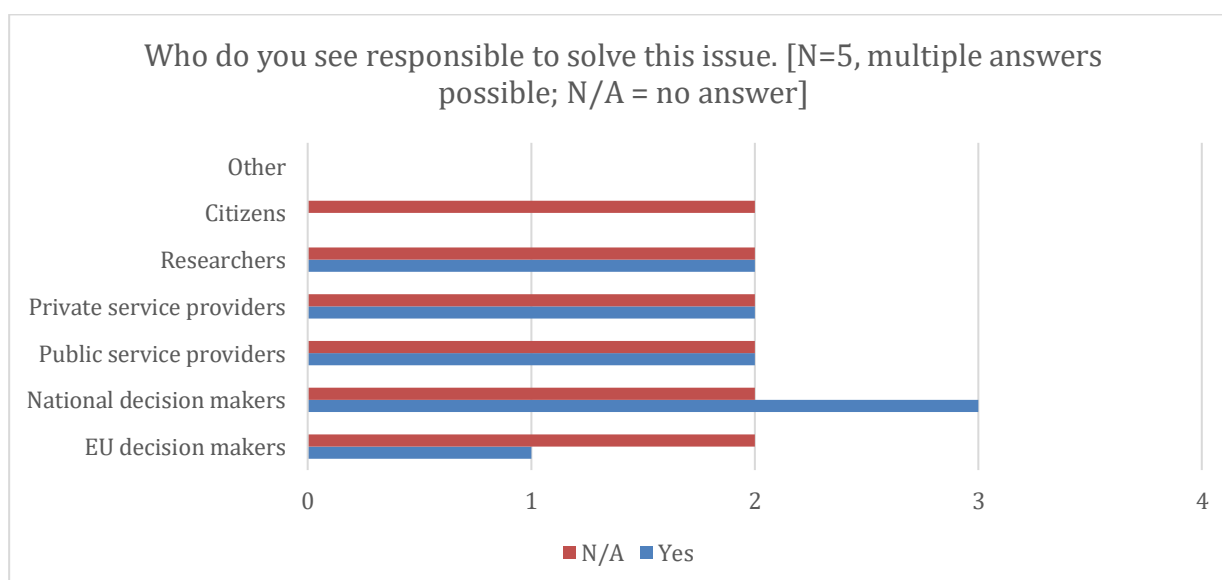**Figure 38: Perception of respondents in regards to how the issue of trust and transparency should be solved.**

Figure 39: Perception of respondents in regards to who should contribute to overcome the lack of trust and transparency.

4.2.4. Social protection

Due to the fact that only one respondent entry was included to the analysis of the questionnaire results in social protection domain, the graphical representations are excluded. The respondent's stakeholder role was indicated as "Data subject".

Question 1 – Political commitment

Statement: *The lack of political commitment hampers resolving most of the issues raised in the scenario. While there are many EU-wide and some national political commitments that outline the importance of the OOP implementation, lack of sufficient political commitment at national and local levels could threaten a seamless implementation of scenario.*

From the survey participant's point of view "creating awareness through petitions or demonstrations and "implementation of successful instances and demonstrating the benefits of the once-only principle by local level service providers" are the activities that could be performed in order to overcome the lack of political commitment in social protection domain. The responsible actors capable to strengthen the political commitment, are the "public service providers" and "national decision makers".

Question 2 – Legal interoperability

Statement: *Many regulations exist at European level to support the implementation of this scenario. However, lack of legal support on national level, different legal settings among Member States and lack of EU-wide legal standards could prevent a successful implementation.*
The following gaps have been identified:
- *Lack of national regulation to assure secure, meaningful, and transparent data exchange*
- *Lack of EU-wide legal standards on required data for issuing birth certificate*
- *Diverse legal settings on birth registration procedures in different countries*
- *Uncertainty of legal requirements for cross-border scenario*

According to respondent, the possible solution of issues related to lack of legal interoperability could be "putting pressure on the implementation of EU-wide standards" as well as "enforcing the implementation on identical legal setting regarding birth registration procedures cross-border". Thus, participant argues that "EU decision makers" and "National decision makers" are the key actors that are responsible for overcoming the lack of EU wide and national legal standards.

Question 3 – Trust and transparency

Statement: *Parent's consent is necessary for data sharing on both national and EU level. However, clear concepts for the data sharing consent do not yet exist on EU level and current infrastructures do not facilitate it. Furthermore, parents should be able to see which authorities (especially when personal data are stored cross-border) have the possibility to see their (parents and new-born) personal data and who, where, and why these authorities used their personal data. However, current information systems do not facilitate it.*
There are the following issues:
- *Lack of a clear concept and solution for the consent of parents for the data sharing*
- *Non-transparent access and use of personal data*

The respondent argues that "putting pressure on the implementation of an EU-wide information system" and "putting pressure on the implementation of transparent processes" could be an appropriate answer to the challenge of non-transparency in use and access of the personal data by service providers. Correspondingly, the "EU decision makers" and "national decision makers" are key actors to bring more transparency and introduce a clear concept for providing a consent for data sharing.

Question 4 – Motivators

Statement: *This scenario only elaborated the birth certificate issuance. It could be expanded with further procedures along the life event of a new-born such as automatic allowance of child benefit from the home country.*

Both activities provided in the questionnaire were indicated as proper solution for overcoming the lack of motivators for applying the OOP in social protection domain. Those activities are: "putting pressure on the implementation of further procedures" and "inform citizens about benefits and positive impacts of the (cross-border) OOP implementation". According to the answer, "EU and national decision makers" as well as "public service providers" could enhance the motivation of citizens to use OOP.

4.2.5. General responsibilities

Table 14 represents the perception of respondents on what kind of common responsibilities should be defined for decision makers at EU and national levels, for public and private service providers, domain experts and citizens. Respondents were asked to assign the responsibilities to each involved actor.

Table 14: General responsibilities of certain actors in education, health, moving and social protection domains according to respondents

Nr.	EU decision makers	National decision makers	Public service providers	Private service providers	University representatives	Students/Citizens	Medical personnel	Patients
1	Clear arguments for citizens about the benefits of once-only. This is especially important concerning data protection concerns	Clear arguments for citizens about the benefits of once-only. This is especially important concerning data protection concerns						
2	Make standards and detailed guidelines for harmonisation.	Cooperate with the other stakeholders.	Cooperate with the other stakeholders and follow the guidelines.	Cooperate with the other stakeholders and follow the guidelines.	Cooperate with the other stakeholders.	Cooperate with the other stakeholders and follow the guidelines.		
3	Regulations, Directives, Governance of Standards and Infrastructures, DSI, BB	Agreement on Standards, Piloting/Labs, Infrastructure Agreements,	Implementation, Piloting/Labs,	Implementation, Piloting/Labs,	Agreement on Standards, Piloting/Labs,	May be integrated as end users		
4	law change (EU level), simplifying the paths of change, providing information about OOP	law change (national level), linking different stakeholders	Active implementation of OOP specifications by Eu and national government	Active implementation of OOP specifications by Eu and national government	Active implementation of OOP specifications by Eu and national government, piloting OOP	Active users of the pilot project		
5	Enforce law	Enforce law	Provide Technology	Provide Technology	Give Ideas/Feedback	Give Ideas/Feedback		

Nr.	EU decision makers	National decision makers	Public service providers	Private service providers	University representatives	Students/Citizens	Medical personnel	Patients
6	Commit politically and pressure member states into implementing changes.	Enforce decisions made by the EU within their country.	Provide necessary systems to the universities.	Provide the necessary technical infrastructure between member states.	Demonstrate the importance of the OOP in the context of studying abroad to the public administration.	Creating awareness of the issues.		
7	Commit politically and pressure member states into implementing changes.	Enforce decisions made by the EU in their country.	Provide the necessary systems and tools to universities.	Provide the necessary technical infrastructure between member states.	Demonstrate the benefits of the OOP in the context of studying abroad to the public administration.	Create awareness of the issues that could be solved with the OOP.		
8	Very high responsibility, creating standards for all universities	Working together with the own universities in country and support them			Trying to find a middle way for the implementation of a system			
9	Responsibility in politics	Responsibility in politics		Responsibility for funding	Responsibility for providing proofs and explanations for how to use	Responsibility of users to use solutions		
10	Very high responsibility, they should show the benefits of this project	Finding a middle way between the states which are involved in this project			Working together with universities which are abroad			

Nr.	EU decision makers	National decision makers	Public service providers	Private service providers	University representatives	Students/Citizens	Medical personnel	Patients
11							Medical personnel: Advisor	Patients: Full control
12	Controlling the processes in the project and maintenance of consistency and implementation. [translated from German]	Focusing on compliancy with prescribed standards during the implementation, and on conclusiveness of implementation. [translated from German]	Working with the private service providers and work towards the best possible implementation. [translated from German]	Work with public service providers and work towards the best possible implementation. [translated from German]			Requirements must be clearly defined and clarified how something can be implemented; whether it can be integrated into daily life or what would be useful in their professional life. [translated from German]	Concerns and ideas must be defined beforehand so that they can be dealt with. [translated from German]
13	Ensure standards and interoperability	Implementation of EU directives, consultation	Implementation management and control, informing citizens	Developing technical solutions			Medical personnel: familiarize with oop in healthcare sector, informing the patients, putting pressure on policy makers	Patients: putting pressure on policy makers
14	They are responsible for the overall strategy. They need to define uniform guidelines for the member states along with a distinct goal, so that	They need to look that the EU goals get implemented in their own country. That means coordinating (or forcing) the stakeholders in their country to do what they have to do. At	They have to develop and implement the tasks that fall into their area of responsibility, e.g. the digital ID or the creation and processing of	They need to adjust their business models in order to be able to provide citizens of the EU with accurate insurance policies that are appropriate for any EU country.				They need to be opened for new and innovative administration solutions. Wanting a more efficient administration process, they should also

Nr.	EU decision makers	National decision makers	Public service providers	Private service providers	University representatives	Students/Citizens	Medical personnel	Patients
	every member is aware what to do.	the same time, they need to collaborate with other member states.	digital standard forms.					participate in the process of evolving the solutions.
15	Creation of a European legal framework for the implementation of the OOP.	Creation of the legal framework in the respective EU member state	Informing citizens about the use of data, as well as data security. implementation of transparency in data usage.	Informing citizens about the use of data, as well as data security. implementation of transparency in data usage.				Acceptance of the Once only principle. Willingness to use it.
16	Creation of a uniform basis for the implementation of national solutions and with respect for international interoperability.	Provision of national basic solutions for the implementation of EU requirements	Provision of national basic solutions for the implementation of national and EU requirements	Cooperation and support of Public Service Providers		Communicating their interests and concerns		
17	Creation of liabilities for the implementation of national solutions with compliance to international standards	Implementation of the European requirements and commitment of the municipal levels	Realisation of digital services through the use and further development of national basic solutions	Further development of national solutions through additional services, extensions and connections to existing systems		Communication of own requirements, wishes and concerns in order to enable the dissemination of the solution to the masses.		

4.2.6. Expectations

Respondents were asked to provide an input on the OOP in general and on the implementation of cross-border OOP scenarios, in terms of advantages and disadvantages. The participants provided their comments in textual form. Those comments were analysed, and certain categories of impacts were derived. In Figure 41, the positive impacts that were raised are illustrated. It can be observed that a majority of the respondents expect "simplification of the processes", "reduction of work" and "time saving". At the same time, "costs reduction" and "security of the procedures" are also expected by the survey participants.
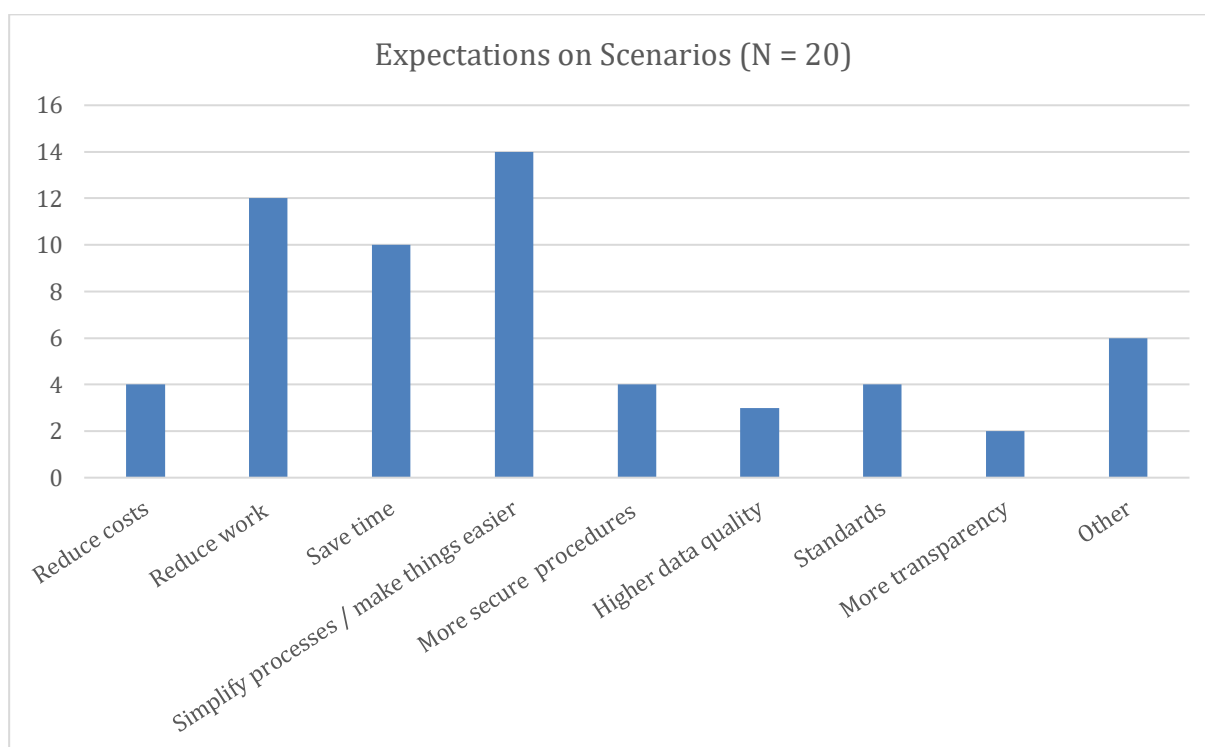
Figure 40: Overview of stakeholders' expectations from the successful implementation of OOP scenarios in education, healthcare, moving and social protection domains.

Under the label "Other" the following positive and negative impacts have been raised:

Positive

- Increase EU-citizens mobility
- Favourable interoperable systems

Negative

- Once-Only is an authoritarian failure by design
- Barriers in the user-friendliness for the new users and older people
- Parallel use of new OOP solutions and systems already in use at national or local level
- Managing of interoperable systems and interfaces

4.2.7. Overall insights

In order to collect information on overall understanding of general concept of once only principle and the cross-border scenarios, the participants were asked to describe their further ideas or comments on the issues and solutions

in education, health, moving and social protection domains, that were presented to them along the questionnaire. The following answers were received from 13 respondents:

- *"Blockchain is an interesting technology for the eEducation domain which may be suitable to ensure certain parts of OOP."*
- *"I think a critical issue is the production of standards and practical guidelines".*
- *"In this case (education) i think it is really important first to set clear standards which will count for all stakeholders. Furthermore, a selfish mindset could be a reason that this project will not work that good as it could be. Stakeholders have to find a compromise!"*
- *"In this scenario, there is no risk of a person becoming too transparent, because only the relevant data is transferred between universities, after the person has given their consent."*
- *"It is difficult to generalize and introduce the OOP in the whole EU"*
- *"It will be hard to implement, but security has to be the first priority."*
- *"The benefits of this project should be shown to all members. Furthermore, the once only principle should take place in public to show, that this project would be fine for everyone (also for citizens)"*
- *"Shift to Citizen Centric Once-Only, i.e. enable security that makes it possible for citizens to get and share data WITHOUT linking service nodes."*
- *"It should be avoided that the information will be received from the data that suggests a certain behaviour so that patients can't be categorized into different types, such as, rarely to sick people. Information that can be considered as disadvantage by changing the job position (e.g. often has a cold and sick leaves) must be protected. It would have to be made clear who and how are the people responsible for ensuring that no sensitive data and information is not forwarded for the uses that are not correlated with treatment."* [translated from German]
- *"The major focus of the whole concept, already at early stages, should be the security, safety as well as transparency. Only with these aspects not only in mind but as main parts advertised with this concept a public acceptance could be possible."*
- *"I think the idea of OOP and a Single Digital Gateway is pretty interesting, because it would make my life in the EU much more convenient in terms of mobility and flexibility."*
- *"As with other scenarios, it is important to ensure political commitment first. Based on this, binding legal bases at the EU level are indispensable to prevent the development of small individual solutions and to create a uniform structure."*
- *"Care must be taken to ensure that comprehensive political commitments and regulations are created at an early stage so that no small independent solutions or even a large number of different non-interoperable standards develop."*

The inputs from the questionnaire participants show that the primary focus of once only practitioners and implementers should be made on standards, transparency and security. Respondents also pointed out that the expectations from the OOP include the availability for the different groups of citizens. On the one hand, one of the advantages of the OOP was defined as a confidence in the transparency level, so that only authorized authorities receive the right to use the data, but on the other hand, the focus was on avoiding the situation when the shared information may have a negative impact on the person (e.g. disclosure of the health details to non-authorized party that cause the problems when looking for the job). Some respondents define generalizing and universalizing of the solutions EU wide as a possible barrier. Finally, the point of the OOP providing more mobility and flexibility to the citizens in terms of cross-border movement is seen in the majority of recommendations.

4.2.8. Personal information

Respondents were asked to indicate their age. Figure 42, illustrates that more than half of the respondents are on the age of 18-30 years. 33% percent of the respondents didn't prove an information on their age.

Age of respondents (N=30, N/A = no answer)

- 18-30
- 31-50
- 51 - before retirement
- N/A

33%
57%
3%
7%

Figure 41: Overview of the age of stakeholders participated in questionnaires in education, moving, healthcare and social protection domains.

Figure 43 reflects the overview of respondents' employment. It is highlighted that almost half of the survey participants are students.

Field of occupation (N=30, N/A = no answer)

- Employed
- Student
- Self-employed
- N/A

10%
40%
47%
3%

Figure 42: Overview of the fields of occupation of stakeholders participated in questionnaires in education, moving, healthcare and social protection domains.

The education level of the respondents is illustrated in Figure 44. In this case the distribution is following: 36% of respondents have bachelor or equivalent degree, 17% of them have master or equivalent and 7% of participants have upper secondary educational level.

Figure 43: Overview of the levels of education of stakeholders participated in questionnaires in Education, Moving, Healthcare and Social Protection domains.

Finally, respondents were asked to indicate their countries of residence. Figure 45 points out that majority of the questionnaire participants are from Germany. Unfortunately, more than one third of the respondents did not provide their residence information.
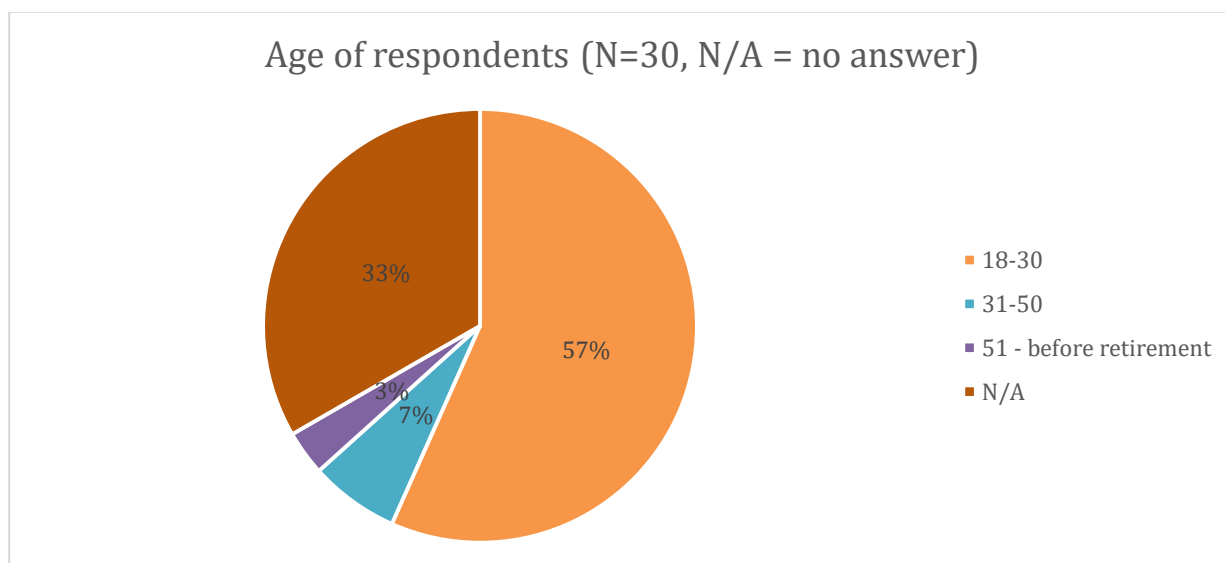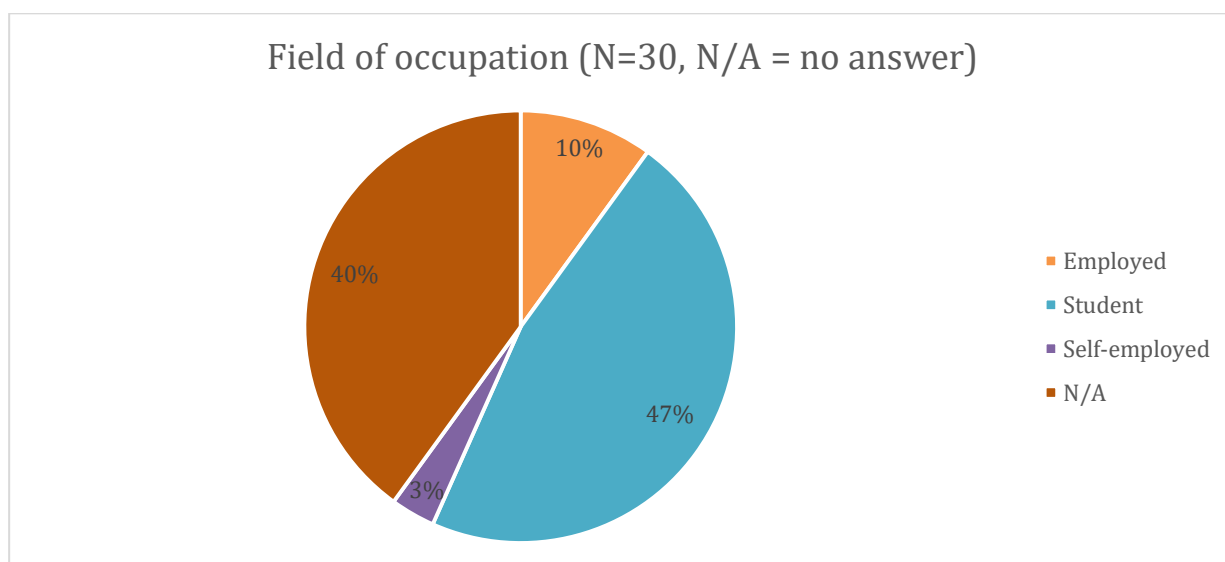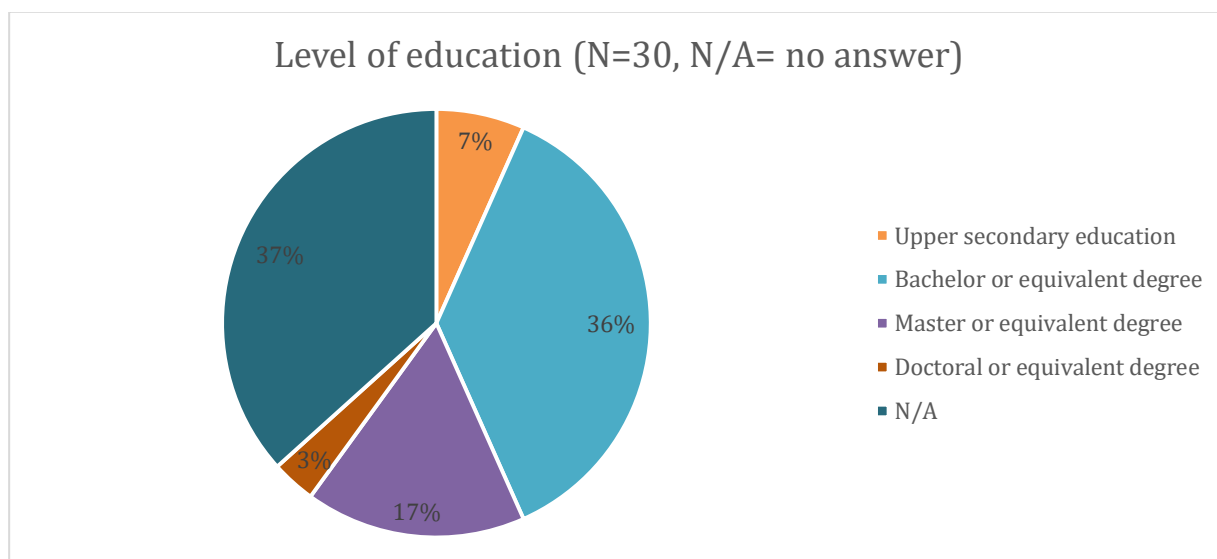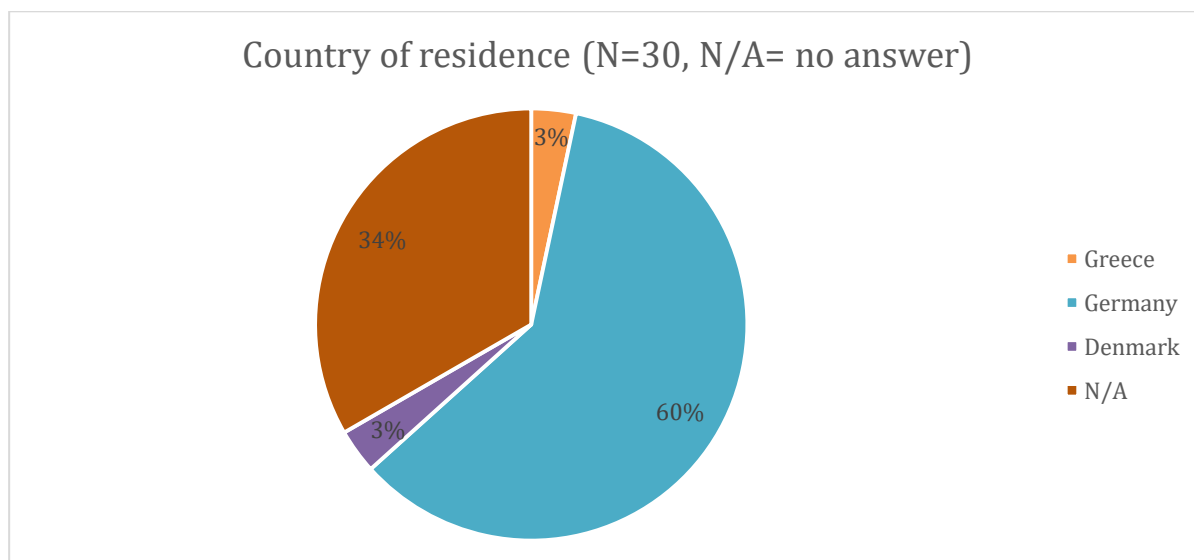

Figure 44: Overview of the countries of residence of stakeholders participated in questionnaires in Education, Moving, Healthcare and Social Protection domains.

5. CONCLUSION

This deliverable documents the work performed under tasks 4.3 and 4.4 of work package 4 of the SCOOP4C project. The amin objective was to identify areas of action and to formulate a roadmap of such areas. The project team has engaged roadmapping methodology to develop, based on the gap analysis in D 4.1, a set of roadmap actions and to cluster them into eleven areas of action.

Along this work, the project conducted a total of eight workshops where stakeholders contributed with their view on roadmap actions and with policy recommendations. Furthermore, the roadmap actions and the policy recommendations were exposed to a validation with the steering board.

For the validation of policy recommendations, a questionnaire was set up, which brought some further, though limited, insight into what are the most recommended directions of how to address the OOP implementation successfully, and by whom.

To sum up the major results reported in this deliverable:

a) Identification of eleven areas of action, which are: motivation for OOP, political, legal, organisational, semantic, technical, interoperability governance, citizen-centred design, data quality, data protection, and trust and transparency.

b) For each area, definition of a set of action which should help overcome the gaps. The actions are described along with expected impacts and responsible actors.

c) Definition of policy recommendations, which are also raised along ten roadmap areas and which are formulated to target EU level and national policy and law makers.

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APPENDIX A

A.1 Education poster with gap indications
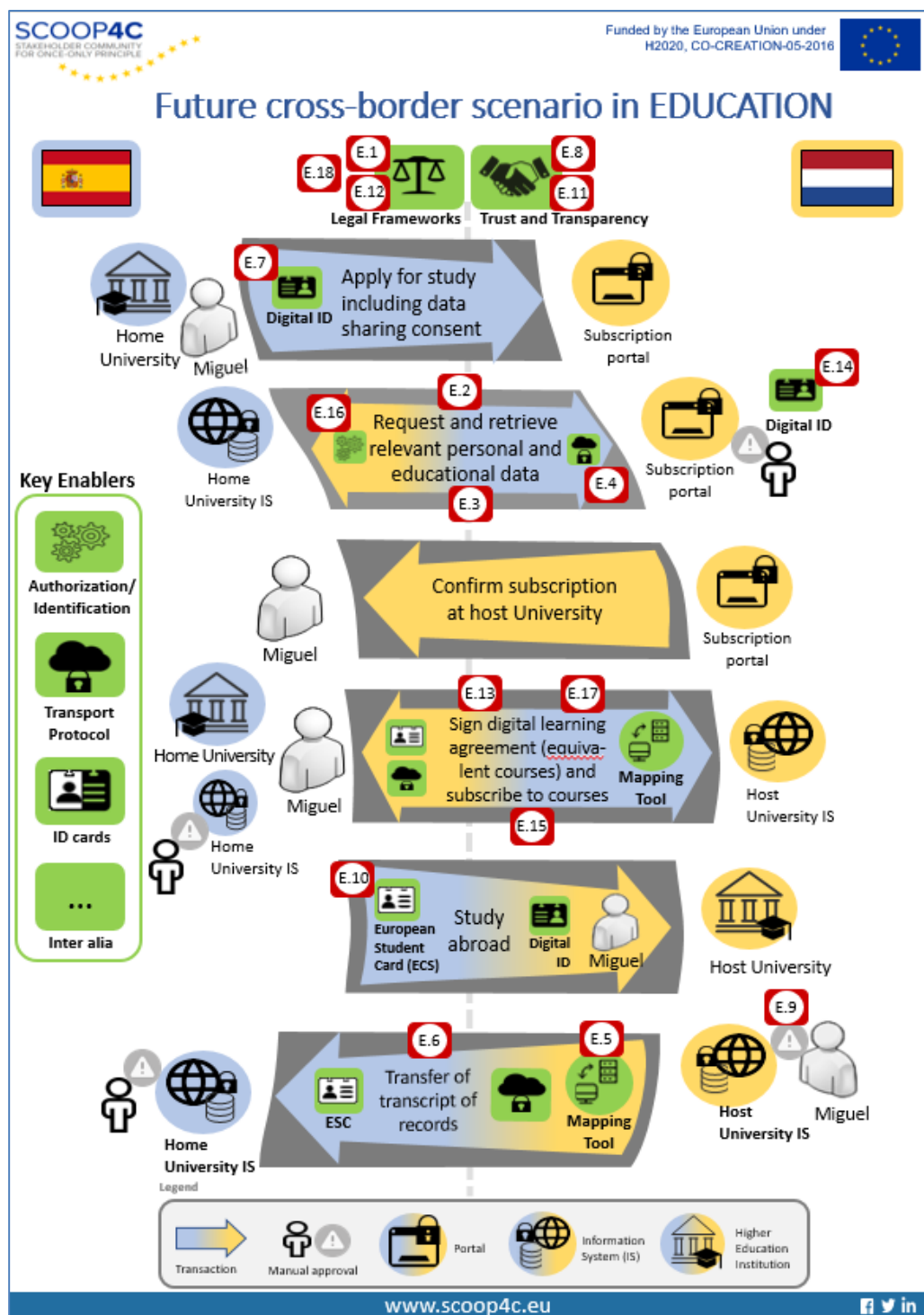
A.2 Healthcare poster with gap indications
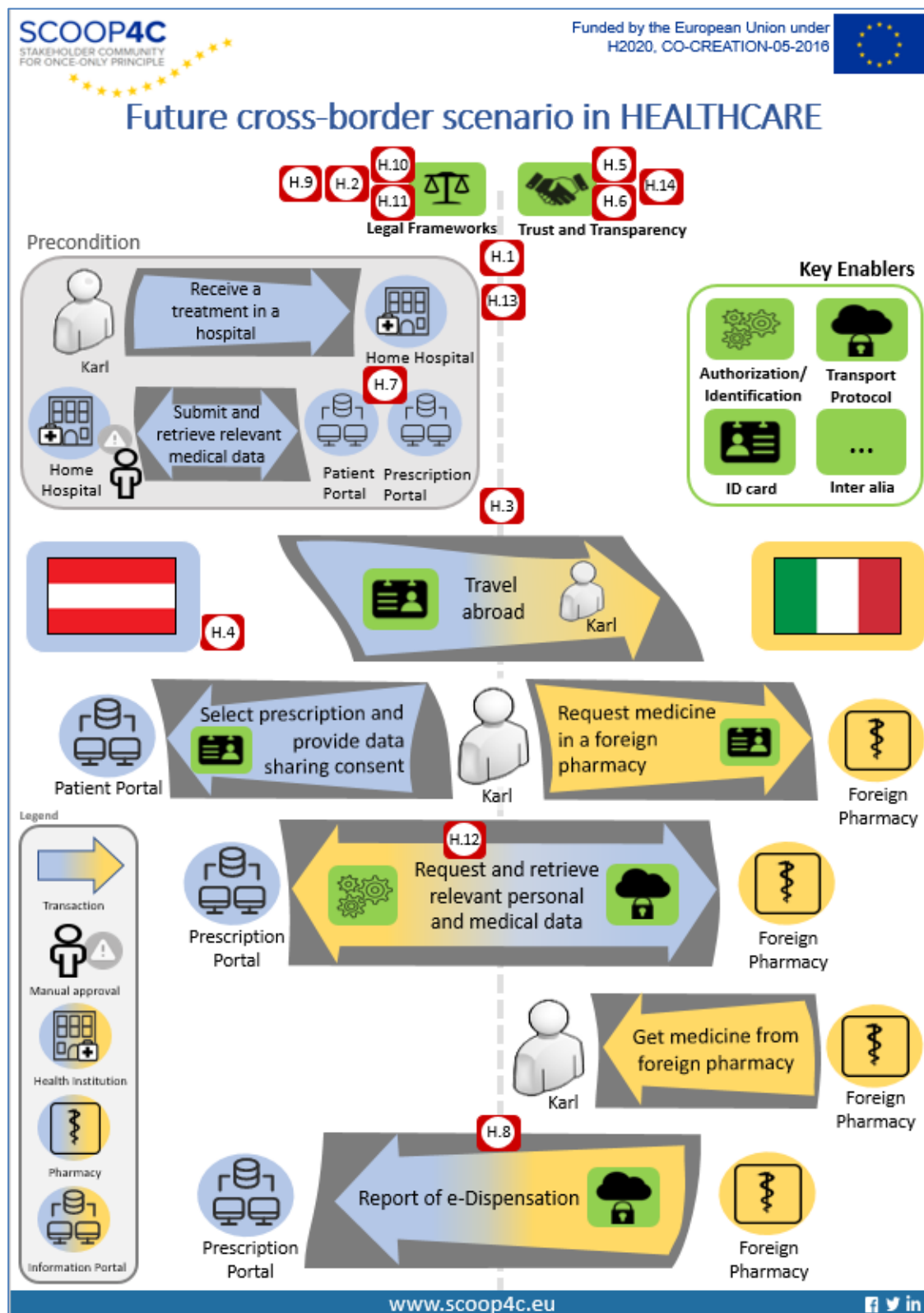
A.3 Moving poster with gap indications
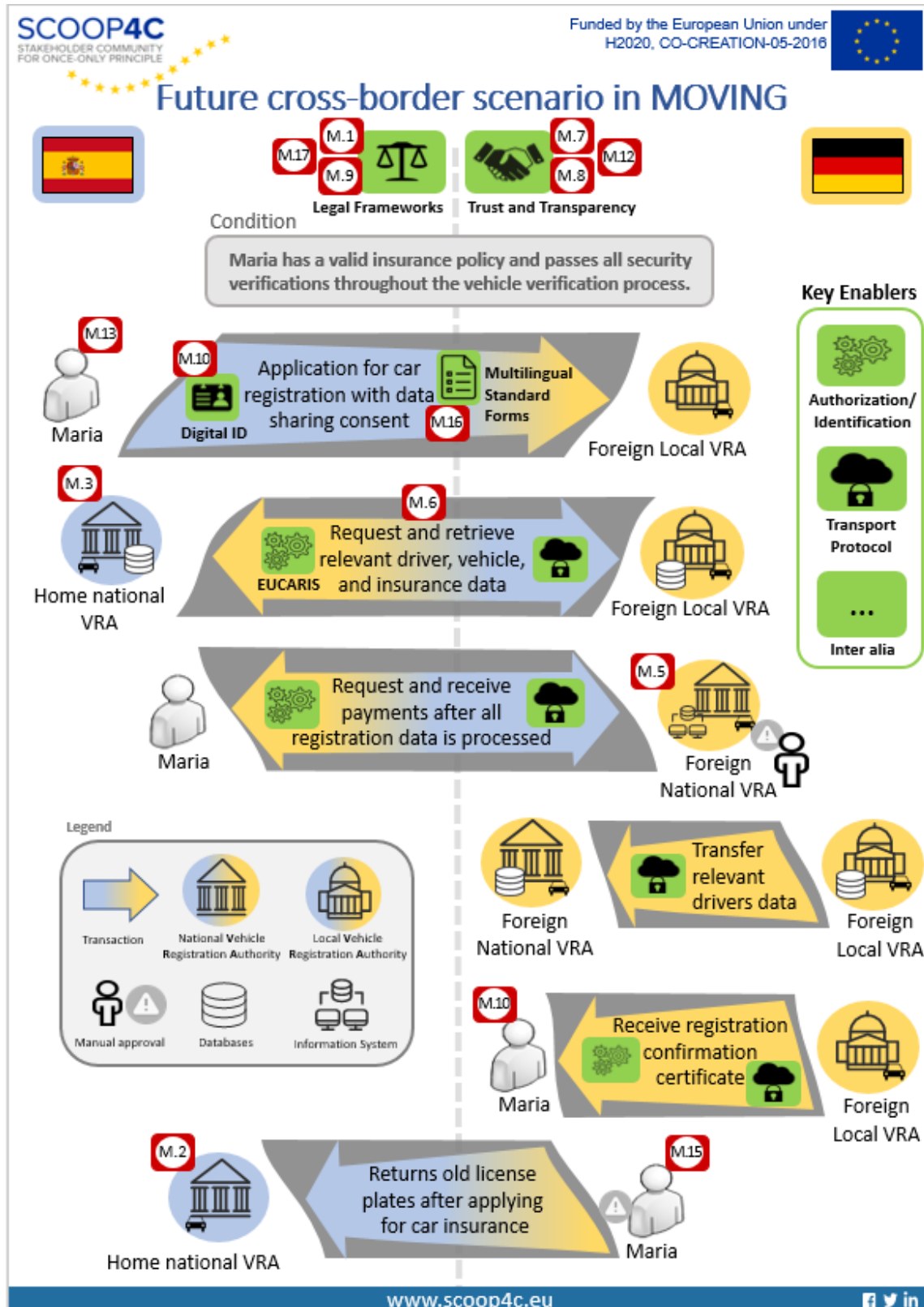
A.4 Social Protection poster with gap indications

A.5 Taxation poster with gap indications

A.6 Handouts of gap tables with brief descriptions and final prioritisation – grouped by scenario domain

Table 15: Handout for workshop discussions in the Education domain - gap table with brief descriptions and final prioritisation

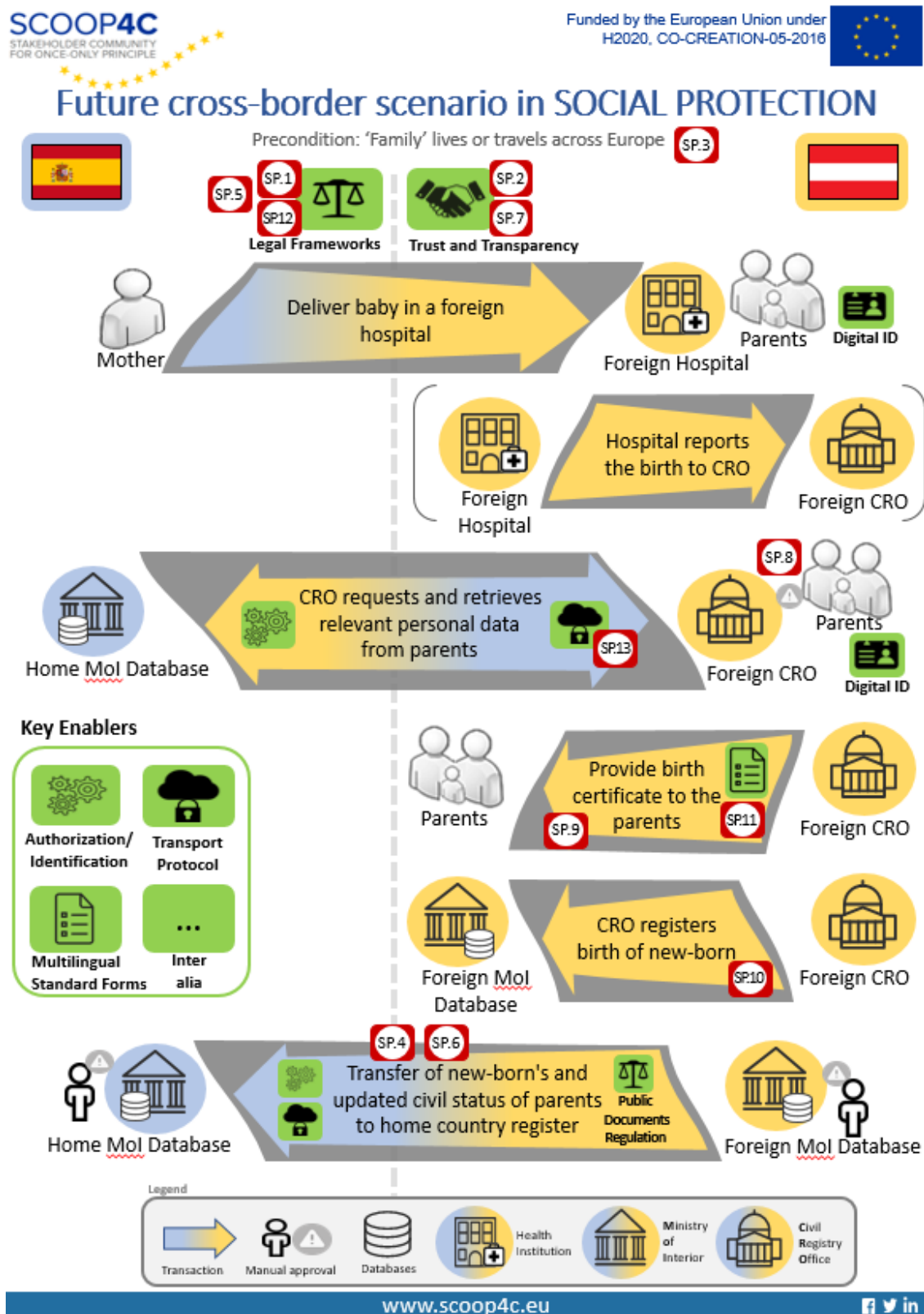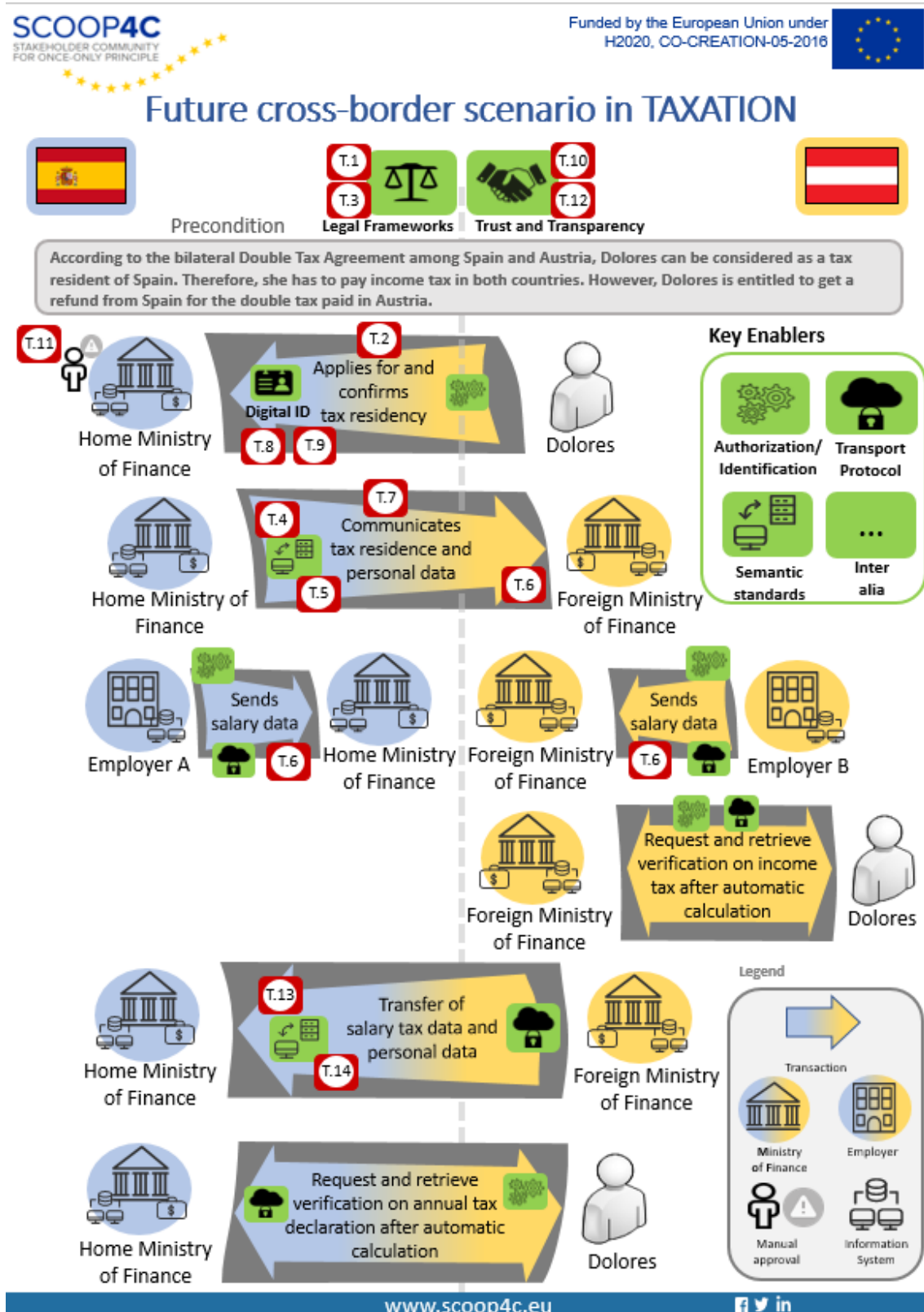| No.	Barrier type	Name of gap	Brief description of gap	Priority
E.15	Political commitment	Contrast between the flexibility of teaching and EU-wide standardisation	The incompatibility between the two concepts, of the freedom and flexibility of teaching on one hand, and EU-wide standardisation and harmonisation on the other hand, has been identified as a potential gap in the education domain. Consequently, an appropriate balance between them on the EU level is needed.	🟥
E.12	Legal interoperability	Lack of regulations to assure secure and transparent digital transmission of personal and educational data between Member States	Though there are a variety of national and European regulations to support this scenario, the absence of sufficient regulations, particularly on national level, could prevent the seamless implementation of the OOP in the education domain.	🟧
E.18	Legal interoperability	Various implementation in different Member States according to a single EU regulation	Some EU regulations are formulated in a way that could lead to diverse implementations among Member States. This could threat the essential harmonisation and interconnection of OOP implementations at EU-level.	🟩
E.1	Political commitment	Lack of sufficient political commitment on national and European levels	There is already some existing political commitment at different levels supporting the OOP implementations in this scenario. However, the lack of sufficient political commitment on different levels (incl. European, national, local, or ministerial) could threat the seamless implementation of this scenario.	🟥
E.2	Semantic interoperability	Missing code lists of necessary objects in the education domain	An EU-wide multilingual code list of objects in education domain is necessary in order to facilitate effective data exchange between different countries. For instance, universities and courses would be easily identifiable by those code lists. This code list will provide a unique identification code for objects in education domain.	🟧
E.3	Semantic interoperability	Missing common standards for educational data exchange on European level	Lack of common standard and framework for exchange of electronic educational information at Europe level can threat implementation of the scenario in this domain.	🟥
E.13	Semantic interoperability	Lack of bilateral digital learning agreement between HEIs	Bilateral digital Learning Agreements between universities will facilitate mapping of courses and credits achieved by student in the host university to the education system of the home university. This agreement could overcome the lingual issue as well.	🟧

No.	Barrier type	Name of gap	Brief description of gap	Priority
E.17	Semantic interoperability	Lack of competency matching for ECTS interoperability	ECTS enables student to mapping and transferring the credits that achieved in one university to other universities. However, matching the competency is challenging.	
E.4	Technical interoperability	Secure transport protocol not established in a cross-border matter	eDelivery exists as a EU building block to facilitate secure data transaction in cross border as well as cross-domain matters; however, it has to be implemented in different sectors including education and taxation. EU-wide secure transport protocols are pre-requirement for secure data exchange that is fundamental base for OOP implementation.	
E.5	Technical interoperability	Lack of use of EMREX as an EU-wide mapping tool	This mapping tool has to be connected as a module to the HEIs in all Member States to be used in a cross-border manner. Currently, HEIs in just six Member States have the possibility to connect.	
E.6	Technical interoperability	Lack of connection between local systems to the European OOP infrastructure(incl. KLIPS, ÖIS, and SIAS)	National information systems are fundamental base for decentralised cross-border OOP implementations. Therefore, the information systems have to connect with existing modules that enable cross-border operation and data exchange (e.g. with mapping tools such as EMREX).	
E.7	Technical interoperability	Cross-border use of eID not implemented across all Member States	According to eIDAS regulation (EU regulation 910-2014), cross-border recognition of national eIDs will be mandatory from September 2018. However, it was not mandatory at the time of scenario development.	
E.10	Technical interoperability	ESC is not yet widely implemented	ESC supports the host university to check student's education status and ease student identification as well as transfer of students report. However, it is not implemented in all Member States.	
E.14	Technical interoperability	Limitation of eID for covering educational information	Further development of eID to facilitate confirmation of students' educational status as well as educational data exchange, could leads to elimination of ESC and further simplification of the scenario. Then eID could be enough for identification and authentication of students as well as verification of their educational status.	
E.16	Technical interoperability	Absence of national eID (Lack of unique identification of subjects)	Unique identification for subjects such as students is needed to facilitate efficient identification and authentication. While national eIDs implemented in most of the Member States, national eID Schemes are in developing phase in countries such as Bulgaria, Cyprus, Czech republic, France, Greece, Italy, Poland, and Romania.	

No.	Barrier type	Name of gap	Brief description of gap	Priority
E.9	Data quality	Lack of a clear concept and solution for the (manual) approval of automatically mapped data	Manual approval of shared (mapped) data should be facilitated by an authorised position in each data environment. This will lead to higher trust and acceptance of the service by citizens.	
E.8	Trust and transparency	Missing transparency about access and use of students' data for students	Transparency is an essential issue in order to accept a public service. This needs political commitments, and regulations to ensure legal interoperability as well as technical infrastructures that facilitate them. At the end, data subject should be able to see whom, when, and why access their personal data.	
E.11	Trust and transparency	Lack of a clear concept and solution for the consent of students for the data sharing	Student as a data subject has to provide consent to host university for data sharing.	

Table 16: Handout for workshop discussions in the Health domain - gap table with brief descriptions and final prioritisation

No.	Barrier type	Scenario Domain	Name of gap	Brief description of gap	Priority
H.3	Political commitment	Health	Lack of political commitment on ministerial level in the health domain	Political commitments at both national and European levels would outline the importance of the OOP implementation in the health domain. However, the absence of commitment at ministerial level could threat the accurate implementation of the OOP in this scenario.	
H.2	Legal interoperability	Health	Lack of clear implementation guides by national and European legislations	There is a variety of regulations on European and national levels to support the OOP implementation in this domain. Nevertheless, the absence of implementation guidelines and agreements by European and national legislation cloud threat the concrete implementation of the OOP in this scenario.	
H.9	Legal interoperability	Health	Conflicting bilateral agreements between Member States	Though existing agreements between Member States could support the EU-wide implementation of the OOP, probable conflict between these bilateral agreements could hinder the OOP implementation on EU level. These agreements should be harmonised or replaced by EU level agreements and regulations.	
H.10	Legal interoperability	Health	Lack EU-wide regulation on health insurances	Different insurance regulations in the Member States could prevent dispense of medicine in foreign countries.	

No.	Barrier type	Scenario Domain	Name of gap	Brief description of gap	Priority
H.11	Legal interoperability	Health	Different proficiency requirements for pharmacist among Member States	There are differing proficiency requirements for pharmacists in different Member States. Additionally, some national legislations limited the access to citizen's medical data to particular professional groups. Consequently, pharmacists with different proficiency levels would have different rights for accessing patients' data, threatening the implementation of this scenario.	
H.7	Technical interoperability	Health	Lack of essential infrastructures, including information systems and portals on national level	Infrastructures such as national portals and information systems provide essential base for the cross-border implementation of the OOP in different domains. Lacks of these infrastructures (e.g. pharmacy portals in this scenario) have been identified as existing gap.	
H.8	Technical interoperability	Health	Lack of EU-wide eDelivery building block in health domain	Absence of the EU level, eDelivery building block prevents direct connection between independent government organizations (and businesses).	
H.12	Technical interoperability	Health	Uncertainties about technical stability	In general, technical stability is essential for smooth implementation of all scenarios. Particularly in medical services it is very crucial to have stable technical infrastructure.	
H.4	Data protection and privacy	Health	Lack of possibility for citizens to limit access to their medical data	The patients should be able to forbid doctors and other data consumers in this scenario to access their health information. In Estonia, patients may do this in patient portal	
H.1	Interoperability governance	Health	Lack of Service Level Agreement (SLA)	Participating bodies often exchange information basis on the bilateral agreements. It would be better to standardise these contracts and open the services on basis of multilateral SLA.	
H.13	Interoperability governance	Health	Potential conflict between legal, semantic, organisational, and technical interoperability enablers	Legal, semantic, organisational, and technical interoperability enablers are needed for seamless interoperability between different entities. Moreover, all these interoperability enablers should match each other's. (Lack of harmony between different interoperability enablers could threat smooth interoperability)	
H.5	Trust and transparency	Health	Lack of a clear concept and solution for the consent of data subject for the data sharing	Data subjects' consent is essential requirement for data sharing on both domestic and EU level. This is not facilitated by current infrastructures. In this scenario, patient should be able to provide consent for data sharing to the specific pharmacy in the foreign country.	
H.6	Trust and transparency	Health	Non-transparent use and access of citizens' data	Patients should be able to see their up-to-date medical data as well as to check whom, when, and why access their personal and medical data. This is currently facilitated for Estonian patient; though, it should be implemented in all other Member States as well.	

No.	Barrier type	Scenario Domain	Name of gap	Brief description of gap	Priority
H.14	Trust and transparency	Health	Lack of solution for data sharing consent in emergencies	In Emergency situations, when patient cannot provide data sharing consent to the pharmacy. They should be able to access to the patient's ePrescription to provide emergency services.	

Table 17: Handout for workshop discussions in the Moving domain - gap table with brief descriptions and final prioritisation

No.	Barrier type	Name of gap	Brief description of gap	Priority
M.3	Political commitment	Lack of political commitment with focus on the moving domain on national level	Motor vehicle registration problems are one of the main concerns addressed by the Single Digital Market as it is compiled by the EC. Therefore, more national political commitment is needed to boost the OOP implementation in this area.	
M.5	Political commitment	Lack of sufficient political commitment at national level	While there are many EU-wide and some national political commitments with emphasis on the importance of the OOP, the deficiency of sufficient political commitment on national and local levels could threat the seamless implementation of the OOP in this scenario.	
M.1	Legal interoperability	Lack of EU agreement on compensations in case of accidents	An EU level agreement on compensations in case of accidents and a legal basis for court cases could be helpful for further development of the scenario. These are hampered by the different socio-economic levels of the different EU Member States.	
M.2	Legal interoperability	Lack of EU regulation for harmonising car's insurance	Currently, there are many car insurances with different tariffs from one Member State to others. EU-wide legislation is necessary to harmonised different aspect of car insurance including tariff. While this shortage does not threat implementation of this scenario, it would be needed for more development of the scenario.	
M.9	Legal interoperability	Lack of legal interoperability and regulation on national and EU level	There are number of national and European regulations to support this scenario; however, lack of sufficient regulation on national level could prevent seamless implementation of the OOP in moving domain.	
M.14	Legal interoperability	Missing right for data subjects to request their old personal data	Data subjects should have legal right to request their old personal data; however, current legislation did not provide this right for them.	

No.	Barrier type	Name of gap	Brief description of gap	Priority
M.17	Legal interoperability	Different ecological standards on national level	Diverse of ecological standards and regulation in different Member States could threats sufficient collaboration on EU level.	🟩
M.6	Semantic interoperability	Need for code lists in the vehicle domain	Multilingual code lists at European level are necessary in order to facilitate effective data exchange in this domain.	🟨
M.16	Semantic interoperability	Lack of multilingual portals and Information Systems on national level	National portals and Information systems have to provide services at least in two languages (English and local language).	🟩
M.18	Semantic interoperability	Lack of translation service for taxation forms	While necessary form in taxation domains are harmonised, a translation service need to be implemented	🟩
M.4	Technical interoperability	Lack of EU-wide data exchange accepted by all Member States (EUCARIS)	EUCARIS has to be put in place by all Member States as an exchange infrastructure in order to facilitate secure data exchange on cross-border level.	🟨
M.10	Technical interoperability	Absence of national eID	While national eIDs are implemented in most of the Member States, national eID Schemes are in developing phase in Bulgaria, Cyprus, Czech republic, France, Greece, Italy, Poland, and Romania.	🟧
M.11	Technical interoperability	Secure and transparent ePayment is not enabled in all Member States and in a cross-border manner	ePayment does not facilitates secure and transparent payment in all Member States.	🟩
M.7	Trust and transparency	Missing transparency on access and use of data	Transparency is an essential issue in order to accept a public service. This needs political commitments, and regulations to ensure legal interoperability as well as technical infrastructures that facilitate them. Data subject should be able to check whom, when, and why access or use their data.	🟨
M.8	Trust and transparency	lack of possibility for data subject to see which data is transferred or will be stored	Data subject should be aware on what kind of data is exchanged (either on domestic or on EU level) and what additional data will be stored. However, current services do not covering this issue.	🟥
M.12	Trust and transparency	Lack of concept and solution of data subject for data sharing	Data subject should be able to provide consent for data sharing. According to some national legislations including German legislation, data subject's consent is necessary in order to exchanging data. However, it is not facilitated on cross-border level.	🟨

No.	Barrier type	Name of gap	Brief description of gap	Priority
M.13	Citizen-centred design	Not sufficient consideration of the real needs of the citizens	Missing knowledge about the real needs of the individuals in the moving domain could leads to inaccurate design and implementation as well as less acceptance of the service by citizens as end users.	🟥
M.15	Citizen-centred design	Non-sufficient service for people with disabilities	The specific needs of the disabled citizens are not facilitated by current infrastructures. Consequently, they cannot participate in this scenario. For instance, portals do not facilitate use of people with visual impairments.	🟥

Table 18: Handout for workshop discussions in the Social Protection domain - gap table with brief descriptions and final prioritisation

No.	Barrier type	Name of gap	Brief description of gap	Priority
SP.5	Political commitment	Lack of sufficient political commitment at national level	While there are many EU-wide and some national political commitments that outline the importance of the OOP implementation, the absence of sufficient political commitment at national and local levels could threaten the seamless implementation of this scenario.	🟥
SP.11	Political commitment	Limitation of languages a birth certificate can be issued in a specific country	A birth certificate is issued in the official language of the host country. It is not per se a barrier for the implementation of the OOP scenario; however, administrative burden may emerge for parents when lodging the certificate in their home country.	🟨
SP.1	Legal interoperability	Lack of national regulation to assure secure and transparent data exchange	There are a variety of regulations at the European level to support the implementation of this scenario. However, the absence of legal support on national level could be considered as a barrier in this scenario.	🟨
SP.9	Legal interoperability	Lack of EU-wide standards on required data for issuing birth certificate	EU-wide standards characterising the required data for to issue a birth certificate could enhance the OOP implementation in this scenario. As mentioned in the scenario, multilingual standard forms are already considered for data exchange for the life event 'birth'.	🟥
SP.10	Legal interoperability	Diverse legal settings on birth registration procedures in different countries	Different legal setting among Member States could prevent sufficient cross-border implementation of the issuing birth certificate.	🟩

No.	Barrier type	Name of gap	Brief description of gap	Priority
SP.12	Legal interoperability	Uncertainty of legal requirements for cross-border scenario	Different legislations in Member States could lead to uncertainty about the necessary steps in this scenario. For instance, reporting the birth in a foreign country to the country of residence is necessary according to some countries' legislation and unnecessary in some other.	
SP.6	Semantic interoperability	Lack of EU-wide common semantic standard	Secure exchange of information is one of the fundamental requirement for the implementation of the OOP. Lack of common standard and framework for secure exchange of electronic information has been identified as a critical gap in this domain.	
SP.13	Technical interoperability	Lack of EU-wide secure transport protocols	eDelivery exists as a EU building block to facilitate secure data transaction in cross border as well as cross-domain matters; however, it has to be implemented in the this area.	
SP.3	Motivators	Offering service for non-popular situation	Delivering baby in the foreign country could be considered as a non-popular occasion.	
SP.4	Motivators	Not comprehensive coverage of related services in this domain	This scenario emphasise on the issue of the birth certificate. Further development of the scenario to including extra procedures such as automatic allowance of child benefit from the home country or payment in the hospital could further motivation citizens.	
SP.8	Data quality	Lack of a clear concept and solution for the (manual) approval of automatically mapped data	An authorised person in both countries should facilitate manual approval of (automatic) mapped data. This will lead to higher trust in and acceptance of the service by citizens.	
SP.2	Trust and transparency	Lack of clear definition and solution for the consent of parents for data sharing	Parent's (data subject) consent is necessary for data sharing on both national and EU level. However, clear definition is not existing on EU level and current infrastructures do not facilitate it.	
SP.7	Trust and transparency	Non-transparent access and use of personal data	Transparency is an essential requirement for acceptance of a public service. This needs political commitments, and regulations to ensure legal interoperability as well as technical infrastructures that facilitate them. In this scenario, parents should be able to see which authorities (especially when personal data is stored cross-border) have possibility to see their (parents and new-born) personal data and who, where, and why used their personal data. However, current information systems do not facilitate it.	

Table 19: Handout for workshop discussions in the Taxation domain - gap table with brief descriptions and final prioritisation

No.	Barrier type	Name of gap	Brief description of gap	Priority
T.3	Political commitment	Lack of sufficient political commitment at national level	While there are many EU-wide and some national political commitments with emphasis on the importance of the OOP, the deficiency of sufficient political commitment on national and local levels could threat the seamless implementation of the OOP in this scenario.	
T.1	Legal interoperability	Lack of EU-wide regulation on double taxation	There are many bilateral Double Tax Agreements among Member States that support the implementation of this scenario; however, this needs to be strengthened by EU-wide legislation.	
T.2	Legal interoperability	Lack of regulation on secure data exchange between public and private entities	Lack of regulation to facilitate secure data exchange at national level is observed not only between public administrations but also between public and private organisations. A legal framework to clarify data exchange in each OOP scenario is needed.	
T.4	Semantic interoperability	Need of the code lists of necessary objects in the taxation domain	A multilingual code list of objects in the taxation domain on European level is necessary in order to facilitate effective data exchange between different countries.	
T.5	Semantic interoperability	Lack of EU-wide common semantic standard for taxation data exchange	The lack of common standard and framework for exchange of electronic taxation information on European level is a gap to reach the scenario in this domain.	
T.13	Semantic interoperability	Lack of semantic enabler to map tax report from foreign country	Citizen in this scenario receive tax reports from both home and foreign countries; however, sufficient semantic enabler is needed to make reports from foreign country understandable for citizen.	
T.14	Semantic interoperability	Lack of EU-wide unique identification for companies and taxpayers	Unique identification for companies on EU level could facilitate sufficient collaboration between national entities and private companies to enhance implementation of this scenario.	
T.6	Technical interoperability	Lack of secure transport protocols in communication	The eDelivery has to be implemented in this area to facilitate secure data exchange that is fundamental base for the OOP implementation.	
T.7	Technical interoperability	Lack of connection between local systems (TAXIS, FON) to the European OOP infrastructure	National information systems are fundamental base for decentralised cross-border OOP implementations. Therefore, the information systems have to connect with existing modules that enable cross-border operation and data exchange (e.g. with mapping tools).	

No.	Barrier type	Name of gap	Brief description of gap	Priority
T.8	Technical interoperability	Missing of an eID enabler to connect national digital ID systems	According to eIDAS regulation (EU regulation 910-2014), cross-border recognition of national eIDs will be mandatory from September 2018. However, it was not mandatory at the time of scenario development.	
T.9	Technical interoperability	Absence of national eID	While national eIDs are implemented in most of the Member States, national eID Schemes are in developing phase in Bulgaria, Cyprus, Czech republic, France, Greece, Italy, Poland, and Romania.	
T.11	Data quality	Lack of a clear concept and solution for the (manual) approval of automatically mapped data	An authorised person in both countries should facilitate manual approval of (automatic) mapped data. This will lead to higher trust in and acceptance of the service by citizens.	
T.10	Trust and transparency	Lack of transparency about access and use of citizen data	Transparency is an essential issue in order to accept a public service. This needs political commitments, and regulations to ensure legal interoperability as well as technical infrastructures that facilitate them. Data subject should be able to check whom, when, and why access or use their data.	
T.12	Trust and transparency	Lack of a clear concept and solution for the consent of data subject for the data sharing	Data subject should be able to provide consent for data sharing. According to some national legislations data subject's consent is necessary in order to exchanging data. However, it is not facilitated by current infrastructures.	

APPENDIX B: ONLINE QUESTIONNAIRE ON POLICY RECOMMENDATIONS

Welcome Phrase

This questionnaire was developed by the project SCOOP4C (Stakeholder Community Once-Only Principle for Citizens). It is funded as a Coordination and support action (CSA) in the EC's Horizon 2020programme, call CO-CREATION-05-2015 - Co-creation between public administrations: once-only principle.

Dear participant,

the SCOOP4C questionnaire will ask you about your suggestions of actions and policy recommendations in order to reach the full potential of the vision for citizen OOP services. It covers 16 questions, which should be answered from a particular OOP stakeholder point of view. You will be able to select the particular OOP stakeholder point of view at the beginning of the questionnaire. To fill in the questionnaire will take approx. 10 minutes.

We thank you very much for your valuable time and inputs that will bring at focus measures and policy recommendations that help realize the potentials of the OOP.

Should you have any questions regarding the OOP or the scenarios presented, please contact us at scoop4c@uni-koblenz.de.

With kind regards,

The SCOOP4C project team

[Question 0] Please indicate your stakeholder role from which you will be answering the subsequent questions. See a stakeholder model of the different roles under this link.

Please choose **all** that apply:
- **Data subject** (identifiable natural or legal person to whom the data, which are collected, held or processed in
- OOP contexts)
- **Data consumer** (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 provider** (any natural or legal entity who holds data about data subjects and makes these data
- available to data consumers)
- **Data recorder** (any entity that registers/updates the data of the data subject)
- **Database owner** (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)
- **Data aggregator** (any entity that is liable for integrating/aggregating OOP data from/to different databases,
- formats, etc.)
- **Data processor** (any natural or legal entity that processes personal data on behalf of [and subject to
- instruction by] the data controller)
- **Data controller** (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 supervisor** (independent public authority that is responsible for monitoring and enforcing the
- application of MS and EU regulations on data protection)

NOTE: An extended description of the listed stakeholder roles is available in project deliverable D2.1.