Identity Management in PUbLic SErvices

D7.15 Overview of conducted standardization activities

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Deliverable nature:	Report (R)
Dissemination level: (Confidentiality)	Public (PU)
Delivery date:	31-01-2024
Version:	0.5
Total number of pages:	122
Keywords:	Standard, CEN, Liaison, Technical Committee

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101004459

Executive summary

The deliverable D7.15 - *Overview of conducted standardization activities* presents the results of Task 7.6 - *Initiation of standardization activities,* which is part of WP7 – *Innovation and exploitation management, dissemination and communication*. This Task 7.6 is a continuation of the standardization activities in IMPULSE, which started with T3.4 - *Analysis of existing relevant standards, and related impacts and implications* in WP3 - *Multidisciplinary analysis of standards, legal and ethical implications.* The focus of this deliverable is set on the interaction of the IMPULSE project with standardization committees and the alignment of the IMPULSE solution with current as well as future standards.

Within a two-part standardization potential workshop in June / July 2022 project results, which can be developed further into a standardization document, were identified. Within the first part of this workshop basic knowledge about the interaction of R&I projects with standardization was given and the opportunity to ask some general questions about standardization was provided. Afterwards, standardization ideas were collected, whereby the results of a survey on standardization prior to the workshop served as a basis. Those ideas were summarized to 11 standardization ideas. As a preparation for the second workshop part, a survey on the interest of the different IMPULSE partners on those ideas was shared. Within the second workshop part an overview of the standardization activities related to blockchain and distributed ledger technologies and possible standardization committees for liaisons was given. Further, the in-depth development of the standardization ideas was started. Due to the relatively high interest in several topics regarding standardization and the connection between some of them, the topics were combined to provide for the IMPULSE consortium two standardization ideas where IMPULSE results can be exploited. Those ideas were “Application of AI and Blockchain in Used Cases - Identity Management in Public Services” and “Consent Management for eID Solutions”. Nevertheless, after a poll querying the interest of the IMPULSE partners in both topics as well as the further development of those ideas and some individual discussions on those topics it was decided to better contribute to already ongoing standardization activities instead of developing a new standard due to the high number of current work items within related technical standardization committees.

After presenting the project in November 2022 to CEN-CLC/JTC 19 - *Blockchain and Distributed Ledger Technologies* and CEN/TC 224 224 - *Personal identification and related personal devices with secure element, systems, operations and privacy in a multi sectorial environment* a liaison was established with CEN/TC 224 in March 2023. During this liaison the focus was on WG18 – *Biometrics* and WG20 - *Ad Hoc Group on the European Digital Identity Wallets.* The meetings of those WG’s were attended by Madlen Schmudde (DIN) as a liaison representative from the IMPULSE project. The liaison with those WG’s mainly offered a wide overview and deep insight into the active work items. The opportunity to include project results of IMPULSE into the draft standards, which were open for comments, was used. Nevertheless, the interaction with CEN/TC 224 made it possible to compare the IMPULSE solution with the standards at the drafting stage, which provided valuable insights. At national level the interaction of IMPULSE with UNE CTN 71/SC 307 for the development of the standard UNE 71307-1 - *Digital Enabling Technologies - Distributed Identities Management Model on Blockchain and other Distributed Ledger Technologies. Part 1: Reference Framework* was continued. Unfortunately, it was decided for the time being to not develop this standard further on European level, which would have been in the scope of CEN-CLC/JTC 19.

Besides the interaction with standardization, T7.6 also covered the aspect of the alignment of the IMPULSE solution with current and future standards. Within deliverable D3.4 standards with a strong relation to the IMPULSE project were highlighted. Those standards were analyzed in this deliverable with regard to their eventual usage for the development of the IMPULSE solution. From those nine highlighted standards five were actually used. In view of the future deployment a list with recently published standards and standards under development with relation to IMPULSE was provided. In the context of the future deployment of the IMPULSE solution the alignment of related standards with regulations is also covered in this deliverable.

Document information

Grant agreement No.	**101004459**	**Acronym**	**IMPULSE**
Full title	**Identity Management in PUbLic SErvices**		
Call	DT-TRANSFORMATIONS-02-2020		
Project URL	https://www.impulse-h2020.eu/		
EU project officer	Giorgio CONSTANTINO		

Deliverable	**Number**	D7.15	**Title**	Overview of conducted standardization activities
Work package	**Number**	WP7	**Title**	Innovation and exploitation management, dissemination and communication
Task	**Number**	T7.6	**Title**	Initiation of standardization activities

Date of delivery	**Contractual**	M36	**Actual**	M36
Status	version 0.5		☒Final version	
Nature	☒Report ☐Demonstrator ☐Other ☐ORDP (Open Research Data Pilot)			
Dissemination level	☐Public ☐Confidential			

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Summary (for dissemination)	*The needs for standardization within the project was identified by all project partners with regard to specific project results achieved at this time within the framework of a workshop organised by DIN. The outcomes of the review of existing standards and on-going standardization activities in task T3.4 was compared with the needs for standardization to support the identification of standardization potential within the project. This includes a prioritisation of the identified standardization potentials. Based on those results, standardization activities were initiated. Those standardization activities support the dissemination and implementation of innovative knowledge. With the aim to spread the awareness concerning standardization activities of the project, information about standards and standardization were provided as part of the dissemination plan.*
Keywords	*Standard, CEN, Liaison, Technical Committee*

Version Log			
Issue Date	**Rev. No.**	**Author**	**Change**
07.2023	**0.1**	**Dr. Madlen Schmudde**	**TOC and first input**
11.2023	**0.2**	**René Lindner, Dr. Madlen Schmudde**	**Update and addition of missing sections**
21.12.2023	**0.3**	**Dr. Madlen Schmudde**	**Integration of partners input**
25.01.2024	**0.4**	**Iria Nuñez, Iñaki Gangoiti**	**Review of the deliverable**
26.01.2024	**0.5**	**René Lindner, Dr. Madlen Schmudde**	**Adjustment of the deliverable according to the review**

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Abbreviations and acronyms

AI	Artificial Intelligence
LoA	Level of Assurance
AWI	Approved Work Item
BC	Blockchain
CCMC	CEN-CENELEC Management Centre
CCPA	California Consumer Privacy Act
CD	Committee Draft
CEN	European Committee for Standardization
CEN-CLC/JTC	CEN-CENELEC Joint Technical Committee
CENELEC	European Committee for Electrotechnical Standardization
CIB	Committee Internal Balloting
CPSTIC	Catalogue of Information and Communication Technology Products and Services
CWA	CEN Workshop Agreement
DIN	German Institute for Standardization
DIS	Draft International Standard
DoA	Deliverable of Actions
EBSI/ESSIF	European Self Sovereign Identity Framework
EC	European Commission
EFTA	European Free Trade Association
eID	Electronic Identification
eIDAS	electronic IDentification, Authentication and trust Services
EN standard	European standard
ESI	Electronic Signatures and Infrastructures
ETSI	European Telecommunications Standards Institute
EUDIW	EU Digital Identity Wallet
FDIS	Final Draft International Standard
FprEN	Final draft European standard
GDPR	General Data Protection Regulation
ID	Identification
IEC	International Electrotechnical Commission
ISO	International Organization for Standardization
ISO standard	International standard
NWIP	New Work Item Proposal
OECD	Organisation for Economic Co-operation and Development
PIPEDA	Personal Information Protection and Electronic Documents Act
prEN	draft European standard
QSCD	Qualified Signature Creation Devices
R&I	Research and Innovation
SC	Subcommittee
SC	Smart Contracts
SSCD	Secure Signature Creation Devices
SSI	Self-Sovereign Identity
TC	Technical Committee
TR	Technical Report

TS	Technical Specification
UNE	Spanish Association for Standardisation
VC	Verifiable Credential
WD	Working Draft
WG	Working Group
WP	Work Package

1 Introduction

1.1 Background and Objective

Standardization was identified as an important topic for the IMPULSE project, which is why a standardization organisation, DIN – The German Institute for Standardization, is one of the project partners. The standardization task within IMPULSE is led by DIN and split into two separate tasks: Task 3.4 - *Analysis of existing relevant standards, and related impacts and implications* going from month 3 of the project to month 24 is part of WP3 – *Multidisciplinary analysis of standards, legal and ethical implications.* Starting from month 16 and going until month 36 of IMPULSE is Task 7.6 - *Initiation of standardization activities* which is part of WP7 – *Innovation and exploitation management, dissemination and communication*.

Within the Deliverable D 3.4 – *Standards and related impacts and implications,* which was due to month 24 of the project the standardization landscape relevant for the project was described. There, it is described how the corresponding Task 3.4 laid the basis for Task 7.6. Within the present deliverable D7.15 - *Overview of conducted standardization activities* the activities carried out within T7.6 are described. Besides ensuring, like already done in Task 3.4, that the IMPULSE solution is compliant with current standards and other standardization documents the main objective of Task 7.6 is to integrate IMPULSE results into standardization. This can be done by developing a standardization document out of project results or by integrating the results into standards, which are already in the development phase. Further, an interaction with relevant standardization committees is sought to ensure the compliance with future standards and to have the opportunity to give input to current work items. Thus, a long-term dissemination of project results and an increased awareness within the consortium for standardization and its opportunities can be ensured.

1.2 Document Structure

The basic principles for standardization were already described in D3.4, clause 2. Since this deliverable is all about directly getting involved with standardization, clause 2 of this deliverable focuses on this topic. Besides some general facts (subclause 2.1), the proposal of a new work item (subclause 2.2), the development of a CWA (subclause 2.3), liaisons (subclause 2.4) and the contribution to existing standards (subclause 2.5) are described in detail. How standardization potentials were identified within the project (subclause 3.2) and what standardization gaps were found (subclause 3.3) is described in clause 3. In clause 4 of this deliverable the contribution to on-going standardization activities is described. Therefore, the relevant standardization activities are considered (subclause 4.2) as well as the interaction with relevant standardization committees (subclause 4.3). Highlighted standards within the context of IMPULSE and recently published standards which could be relevant for a future deployment of the IMPULSE solution are the focus of clause 5. The alignment of standards with regulations, especially the eIDAS regulation in the broader context of IMPULSE is the topic of clause 6. Subclause 6.1 covers the relation between IMPULSE and the European Digital Identity Wallet and subclause 6.2 deals with standards and their connection with the eIDAS regulation. Finally, the conclusions are provided in clause 7.

2 Getting involved in standardization

2.1 General

In deliverable *D3.4 - Standards and related impacts and implications* the different types of standardization documents as well as the standardization process on international, European and national level was described. This chapter describes the many ways to get involved in standardization especially for R&I projects like IMPULSE.

To better understand the further descriptions, it is important to know how a standardization body is structured in general. The standardization work takes place in technical committees (TC's) which are technical decision-making bodies with a title, a scope, and a work program. It manages the preparation of standardization documents in accordance with the agreed business plan. To ensure a high value of standards, the TCs are composed of experts belonging to different interested groups, so called working groups (WG's) (Figure 1). Any expert is welcome to apply for a seat in a national TC. The applications will be examined, depending on the composition, the number of experts already present in the relevant TC, and the regulations of the national standards body. Experts, who are members of national TC's, have the chance to participate in European and international standardization. They are sent as national delegates to European or international TC's to represent the national interests within a standardization project.

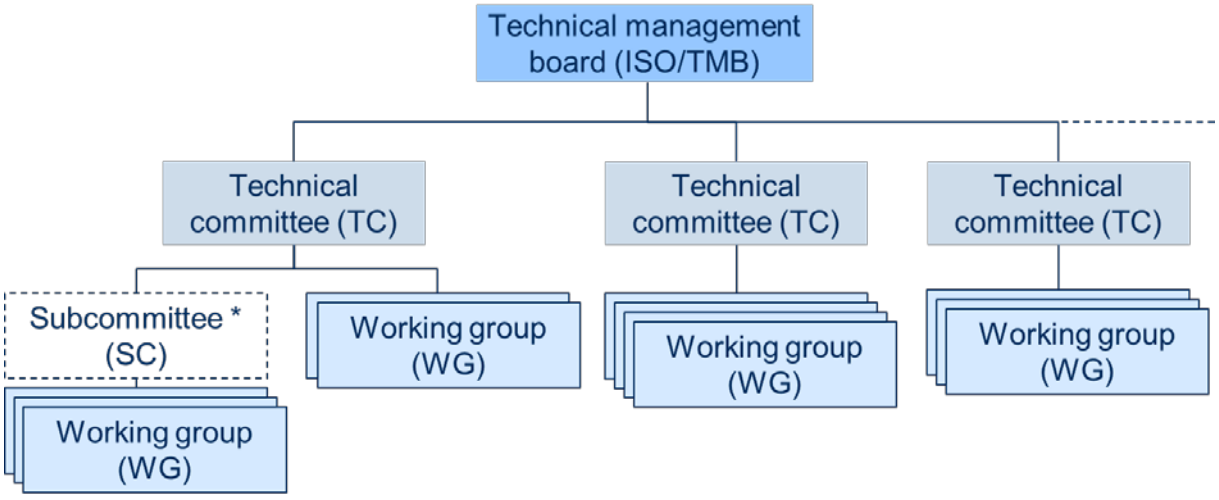


Figure 1: Structure of a standardization body (example within ISO).

***Subcommittees are not always part of the structure.**

The different options to participate in the standardization process are illustrated in Figure 2. Usually, the general way to participate in standardization starts at the national level, where everyone can join the national standardization committee to participate as an expert directly in the work. People from outside those technical committees have the opportunity to propose new standardization topics to the national standards body or comment on public draft standards. This is a quite powerful possibility, as the responsible committee has to discuss every comment. Every person who made a comment also can join the meeting to discuss the comment in person.

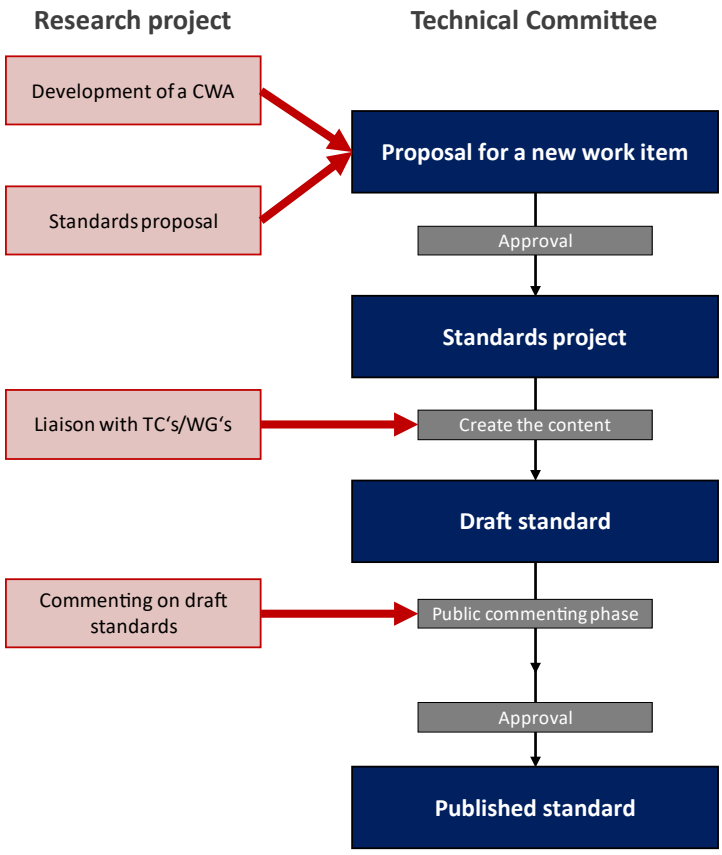


Figure 2: Options to participate in the standardization process.

European associations and research projects have the option to participate directly at the European and international level through liaisons with TC's. Besides proposing new work items, the initiation of CEN/CENELEC Workshop Agreements (CWA's) is suitable to address quick standardization needs. The choice on how to participate in standardization and which instrument to use depends strongly on the individual case. The different options which are suitable for R&I projects are presented in the following focusing on those at European level.

2.2 Proposing a New Work Item Proposal

2.2.1 General procedure

On European level new standardization documents like European Standards (EN), CEN Technical Specifications (CEN/TS) or CEN Technical Reports (CEN/TR) that are developed within CEN Technical Committees (CEN/TC) are usually initiated by a New Work Item Proposal (NWIP), which is commonly proposed by a TC or a corresponding WG. The experts within the WG recommend the NWIP to the TC for balloting, and the TC then decides on how to proceed.

The Committee Internal Balloting (CIB) is subsequently started; it constitutes an enquiry with all CEN member states. Each member state has one vote on whether to proceed with the NWIP or not, and they vote according to the outcome of their respective national enquiry. The national experts can leave comments and information about deviating national regulations that should be taken into account and they can volunteer to participate in the work on the European Level if the NWIP is accepted. The TC then determines the outcome of the CIB. Other entities that can propose a NWI are the EC or EFTA Secretariat, international organisations or European trade, professional, technical or scientific organisations or national standardization bodies of CEN member states.[1] A common misinterpretation is that any person or organisation can propose a NWI at European level. The usual way is to propose the work envisaged at national level to the national standardization body which then considers whether this work should possibly be carried out at the European level.

[1] https://boss.cen.eu/startingnewwork/pages/propnewwork/pages/

When proposing a new work item, it is highly advisable to deliver a first draft of the envisaged document in order to convince fellow members of a working group to actively collaborate on the topic as well. Once the NWIP is accepted, there is a rather strict time frame to be followed, and the time to the next steps, such as the enquiry, is limited. Within European research projects, a NWIP could be a potential deliverable to start new standardization work that uses the results of the project.

The technical committee evaluates the need and checks whether standardization activities are already taking place or if standards already exist. If there is an interest within the committee and no standards are established yet, the committee can then initiate the development of the new standard. If the committee decides to develop the document, the drafting phase starts within the relevant WG of the responsible TC. If there is not yet a WG where the topic thematically fits, a new WG could be established within the TC.

On international level the process is similar.

2.2.2 International harmonized stage codes for standards

All standards are labelled with stage codes indicating their progress of work. The different stage codes can be seen in Figure 3.

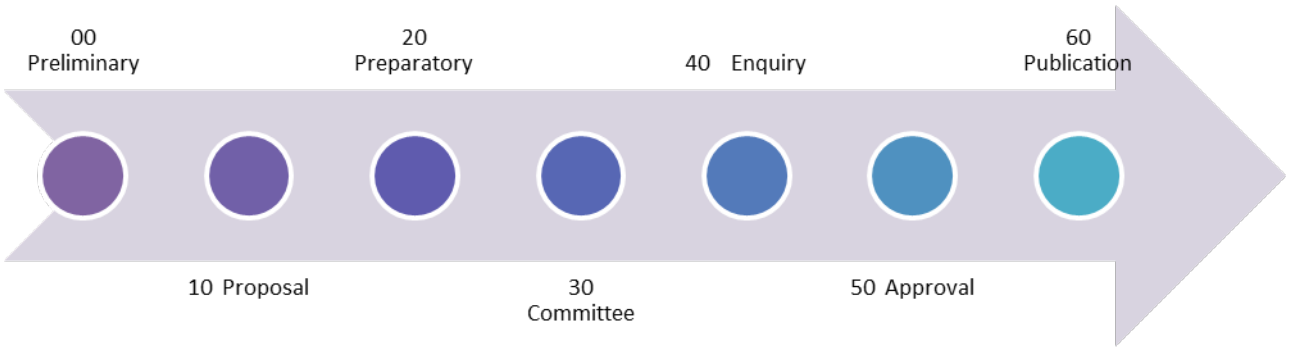


Figure 3: International harmonized stage codes for standards.

The series of codes starts with the code 00.00 *Preliminary*, which means that the proposal of the new project has been received. When the project is registered, it is given the code 10.00 *Proposal*. If the committee decides to follow up the project, the *Preparatory* phase starts (20.00) and the document (called working draft – WD) is developed.

A WD is established and commented on within the WG only. When the WG approves the WD, the next phase starts. In this stage (30.00 *Committee*) the TC is involved, and the document is called CD (committee draft). If the CD is approved by the members of the TC, the next phase (40.00 *Enquiry*) starts. At the end of this phase the international document is registered as DIS (draft international standard) and the European document as prEN (draft European standard).

The DIS / prEN is released for a commenting period, which involves the public. All received comments need to be discussed in the working group. The finished standard is then either published by consensus (stage 60.00 *Publication*) or, if technical changes need to be considered, reaches stage 50.00 *Approval* and is registered as FDIS (international) or FprEN (European). After the approval, the document will then be published by consensus (stage 60.00 *Publication*).[2]

2.3 Development of CEN/CENELEC Workshop Agreements

A CEN (or CENELEC for electrotechnical topics) Workshop Agreement (CWA) is a normative document that is developed and approved outside the technical committee structure in a temporary CEN or CENELEC Workshop to meet an immediate need. The development of Workshop Agreements can be used as a quick

[2] https://www.iso.org/files/live/sites/isoorg/files/developing_standards/docs/en/stage_codes.pdf

standardization tool on the European level for EU-funded research projects. These Workshop Agreements can be initiated out of an R&I project and can be created and published within the timeframe of the project.

The nature and the procedure of a CWA is described in the CEN-CENELEC Guide 29.[3] The process can, in general, be divided into different phases starting from the proposal phase, followed by a drafting phase in which the manuscript will be written; a development phase in which the workshop members further discuss and improve the manuscript; an optional commenting phase (mandatory if the CWA deals with safety aspects) allowing the public to give comments on the script and finally the publication phase. An overview of the main steps of the process can be seen in Figure 4.

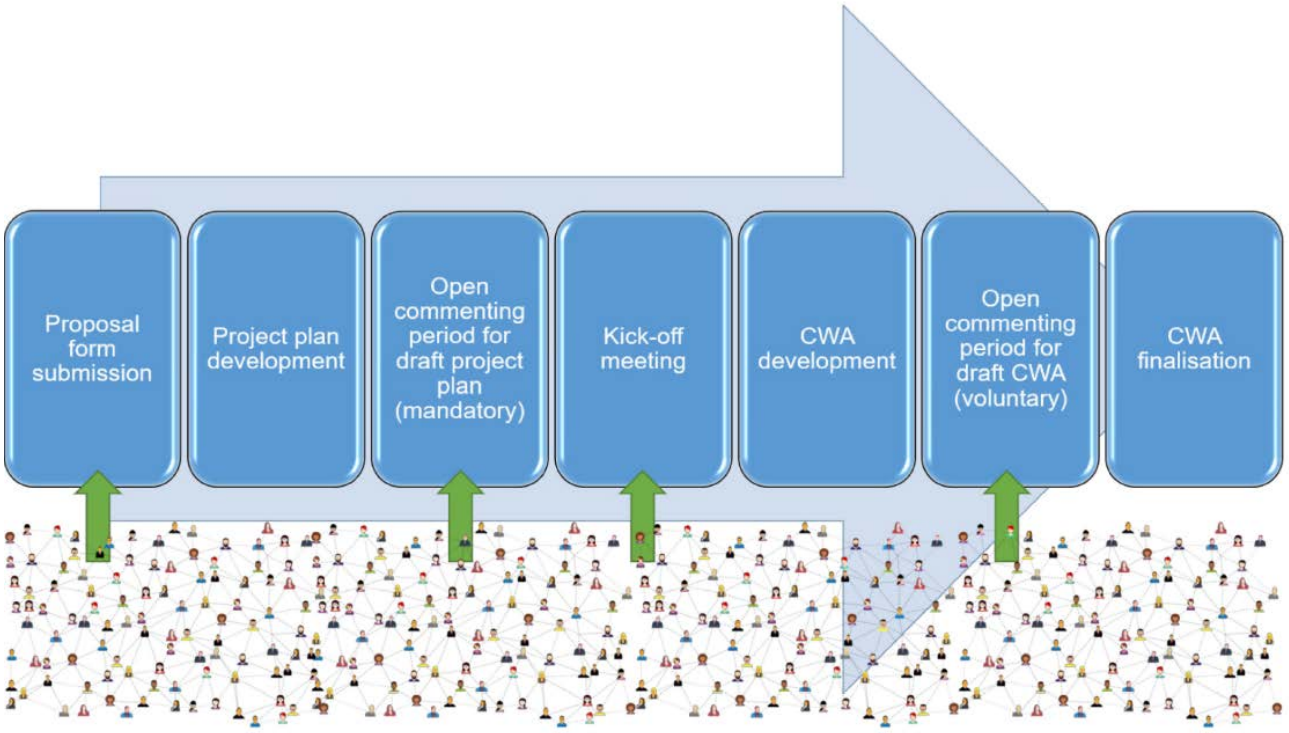


Figure 4: CWA development process[3].

The development of a CWA starts with the proposal phase. Anyone can submit a proposal for a new CWA to either CEN, CENELEC or the national standardization body. During this phase, the initiator of a proposed idea and the standardization body work together on the formal initiation of the standardization project. The initiator provides information on the idea allowing the standardization body to check if there are existing standards or standardization activities on this topic that would permit the development of a CWA. A CWA is not allowed to conflict with standards. If there is a standardization gap that can be filled with the proposed idea, the next step can be initiated.

A project plan needs to be set up by the proposers with the help of a standardization body. The project plan aims to inform the public about the idea, thus the project plan is published for 30 days. The project plan includes the background to the proposed workshop, the motivation for the creation of the workshop, and information on the market and legal environment, including a list of existing standards and standard-related activities and documents. Information regarding the workshop proposers and workshop participants with a short description of their background is also included. The scope shall be set and should be very clear, providing an overview of what is within the scope of the document and what is excluded. Furthermore, the target group of the CWA should be mentioned. The working plan and schedule should be presented, also including the work that has already been delivered. Other sections refer to the workshop structure, resource requirements, related activities and liaisons, usually filled in by the proposed secretary of the workshop. Furthermore, it is important to set up a date and venue where the kick-off meeting is about to take place to ensure the possibility of direct participation of anyone with an interest.

[3] chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.cencenelec.eu/media/Guides/CEN-CLC/cenclcguide29.pdf

The project plan is sent to CCMC together with the agenda of the kick-off meeting and is published by CEN or CENELEC for comments. All the inputs received will be addressed during the kick-off meeting. If the proposed topic touches a scope of a European standardization committee, the technical body shall be consulted on the CWA proposal.

The kick-off meeting shall take place after the end of the first commenting phase. During the kick-off meeting, the workshop chair is appointed and the project plan is approved by the workshop participants. With the approval of the project plan, each participant of the kick-off meeting, who voted in favour of the project plan, becomes a member of the workshop and the drafting phase starts. The workshop committee is then responsible for the development of the document. If, during the initiation phase, the workshop has decided that a public consultation should be done, the draft version of the CWA is published for 30 days. A commenting phase for 60 days is mandatory if the CWA includes safety matters. In case of a public commenting phase, each of the comments received must then be discussed in the workshop. The consortium does not have to take into account the feedback of the general public, but they can, if they want to. When agreement on the technical content of the CWA is reached, the document is published and all organisations that approve the CWA will be listed in the European foreword.

The CWA is a specification and therefore does not have the same character as a European or international standard. Thus, this standardization document brings no obligation to be adopted at national level contrary to European standards. A CWA can be used to support the market and is ideal for R&I projects because of its short development time which allows the creation and publication of the document within the project duration. The timeframe for the creation of a CWA is about 6 to 12 month and the lifetime is restricted to six years. After three years the participants of the workshop have to decide if the document is reconfirmed for another three years, revised, proposed for an upgrade into a EN or ISO standard or withdrawn. After six years the document has to be withdrawn or transformed into another standardization deliverable. Since a CWA can be used as the basis for the preparation of a full standard, it may be a first step to an ISO or EN standard. That is why it has the character of a "pre-standard".

2.4 Liaisons

Without being delegated from the national standardization committee to European or international technical committees, there is the possibility for organisations, forums and consortia to establish a liaison with TC's and WG's. On European level according to CEN/CENELEC Guide 25[4] a liaison can be established for interest groups which are committed to provide input to the work of a technical body. Therefore, the liaison organisation is expected to provide high quality, added-value expertise in a defined technical field. For a R&I project such a fee-based liaison can be established on European level to a TC and its corresponding WG's for the project duration. The liaison enables to access all committee documents that have been circulated via a document exchange system and the attendance of meetings of the TC including its WG's. A liaison provides insight into the work programme of the TC and its WG's. This can help to get an impression of the future standardization landscape of a specific topic and can also support identify standardization gaps. A liaison further provides the possibility to get into contact with the experts working in this field and expanding the network. In the framework of a liaison with a CEN/TC accompanying rights are:

- Access of the working documents associated with the TC including its WG's
- Possibility to propose technical documents
- Possibility to introduce preparatory work as a support to ongoing standardization activities
- Possibility to submit technical contributions to the body's meetings
- Possibility to formulate advice on current and future standards programmes
- Participation in TC's as observers
- Participation in WG's as experts
- No voting rights

[4] chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.cencenelec.eu/media/Guides/CEN-CLC/cenclcguide25.pdf

For R&I projects the possibility to comment on draft standards offers the opportunity to include project results and content into standards and therefore supports the long-term dissemination of the project results.

2.5 Contribution to existing Standards

Everyone can comment on standards when their draft version is published. A draft version of a standard is published when either a new standard is developed, or an old standard is revised. This is an essential part of the standardization process since it provides the opportunity to collect comments by every interested party.

At the latest every five years, each standard needs to be reviewed regarding its current relevance and actuality. If the standardization committee decides to revise a standard its draft gets published for commenting – for national (German) standards it is two months, for a European standard and an international standard it is three months. Within this framework, the European standard is understood as an EN standard developed by technical committees from CEN or CENELEC and the international standard is understood as an ISO or IEC standard developed by the technical committees of ISO and IEC.

Comments are always provided to the national standardization committee, which mirrors the European or international committee in the corresponding country. The corresponding national committee decides which comments they see as relevant for the standard, and in case of European or international standards, they pass those comments to the European or international committee, where they get discussed again.

A contribution to existing activities and standards should especially be made, if:

- an existing standard or draft standard is inaccurate,
- a standard is hindering innovation, and/or
- standards contradict each other.

The responsible CEN/TC has to be contacted immediately, if a standard hinders innovation or if standards contradict each other. In case of an inaccurate standard, a research project or organisation could improve the standard by taking part in the public commenting phase of the draft document. The CEN[5] and ISO[6] search websites can be used to identify such draft documents in the public commenting phase. An organisation or research project then has to fill out the commenting form and send it to a national standardization body that can forward it to the respective CEN/TC before the end of deadline. The standardization committee must discuss each comment. Nevertheless, the standardization committee decides whether they accept or reject received comments.

[5] https://standards.cencenelec.eu/dyn/www/f?p=CEN:105::RESET
[6] https://www.iso.org/advanced-search/x/

3 Standardization potentials within IMPULSE

3.1 General

Within Task 3.4 - *Analysis of existing relevant standards, and related impacts and implications* an overview of the standardization landscape related to IMPULSE was given (see deliverable D3.4 - *Standards and related impacts and implications*). Due to the awareness raised with this task within the consortium for current standards, the basis for the identification of standardization gaps was created. With standardization gaps missing standards in the set of standards are meant, which are identified by the IMPULSE project due to the expertise within the consortium. Since IMPULSE is a European R&I project special focus was laid on the European level always keeping the activities on international level in view. The identification of standardization gaps can lead to the proposition of a new work item or the initiation of a CWA if such needs can be addressed by the projects results. This is a valuable way to create a standardization document out of project results which ensures the long-term dissemination. Within the DoA a workshop on standardization hold by DIN is foreseen to identify standardization needs out of IMPULSE with the aim to produce a standardization document like a CWA or to determine the possibilities in detail to contribute to already ongoing standardization activities.

3.2 Identification of standardization needs within IMPULSE

3.2.1 Standardization potential workshop

3.2.1.1 General

The standardization potential workshop took place in two parts in June and July 2022. The first part was planned as a virtual workshop from the beginning, whereas the second part was originally planned as a face-to-face meeting but was later on transformed in a hybrid meeting. The aim of the first part of the standardization potential workshop was to collect ideas which have from the view of the project partners the potential and need to be transformed into a standard. Within the second part of the workshop the focus was to develop those ideas further to evaluate which of them should be developed into a standardization document. In doing so standardization gaps were identified as well as possibilities to contribute to ongoing standardization activities.

3.2.1.2 Preparation standardization potential workshop

In advance of the first part of the standardization potential workshop a survey was shared with the consortium to get an impression on their interest and involvement in standardization and the most relevant project results which can possibly be transferred into a standardization document. Besides the query of general information from the persons the survey included one part with regard to their interest and involvement in standardization and one on their view on the IMPULSE results (see A.1.1).

The survey was answered by 11 partners from 10 organisations which were active in every work packages. Only one project partner affirmed that he is recently involved in the development of a standard. He explained that he is currently working on several e-signature standards from ETSI and also on those within ISO/TC 307 - *Blockchain and distributed ledger technologies*. When asked for their interest in a specific TC two of the partners who filled the form stated that they are interested and mentioned those for Artificial Intelligence and ETSI ESI. The question if they would like to standardize anything or if they are aware of an area in the context of IMPULSE where standards are still missing was affirmed by four partners. One of them suggested a standard out of the IMPULSE project for the envisioned wallet function to avoid fragmentation since the same basic information is collected from the users repeatedly and used for authentication purposes in separate data bases. Further, standards related to privacy and protection of personal data were suggested. In this context it was pointed out that there are already ongoing standardization activities with regard to the e-wallet components like interfaces and so on and that it is recommended that the IMPULSE partners contribute to those activities individually where appropriate without necessarily having IMPULSE directly proposing a new standard.

Within the part on IMPULSE results it was inquired what the most relevant result or technology in IMPULSE for the partners at the moment or even in the future is. The question was filled by all the partners and the answers, some were mentioned more than once, which is why they have been grouped together, are listed in the following:

- ID document verification
- the application of AI for biometric identification and document verification
- face recognition
- the comparison of the case studies in terms of usability and applicability
- IMPULSE as an alternative solution to the digital identification of citizens
- validation of usability of the wallet in the context of public services
- Consent management
- the use of the blockchain concept
- development of electronic identity.
- SSI and certified use of facial metrics for 'official' identification

In 60% of the time the partners were aware of standards which already exist in the mentioned areas, but it was also mentioned that there is an uncertainty if the existing standards will suffice. Regarding the application of AI for biometric identification and document verification it was mentioned that it would be useful to have a standard for it since this is momentarily missing. But it was also remarked that due to that new and rapidly evolving technology such a standard would have to be updated constantly. Also, with regard to consent management it was mentioned that a standard would be useful for it.

3.2.1.3 Standardization potential workshop – part 1

The first part of the standardization potential workshop took place virtually on 16th June via Webex with 21 participants from the IMPULSE project. The results from the survey (see 3.2.1.2) were integrated in the presentation for the first part of the standardization potential workshop (see A.1.2). At first, the standardization task was explained to ensure that everyone was aware of the aim of this task. Then, some basic knowledge on standardization was conveyed like definitions, different standardization documents or types of standards. After the presentation the workshop took place on a Conceptboard (see A.1.3) to actively involve all the participants. After familiarizing with the prepared Conceptboard the participants had the chance to ask some general questions with regard to standardization by creating a note on the board. Those questions were discussed immediately. The next task was to collect some ideas on what could be standardized. The ideas from the survey were already included on the Conceptboard and within the standardization session the following ideas were added:

- Icons for consent management
- Consent forms and data privacy standards from the project
- Face recognition
- Roadmap writing for quality assurance from the preparation phase to the writing phase
- Assessment tool to analyse if a solution like IMPULSE would be suitable for different public administration services
- Application of AI in the context of face recognition and documents verification

In this part of the workshop it was also suggested to participate as IMPULSE in ETSI/3GPP or similar standardization bodies especially with regard to the topics like e-wallet, blockchain and verifiable credentials, artificial intelligence and qseal verifiable credentials.

After this workshop a survey was shared (see A.1.4) to evaluate which of the suggested topics for standardization are worth pursuing. In addition to the standardization ideas mentioned on the Conceptboard also innovations from the Innovation Radar Questionnaire were added to analyse if interest in those topics with regard to standardization exists. For 11 topics it was queried if the specific topic is interesting for the individual person and what the challenges in this topic with regard to IMPULSE are. This survey was filled by 13 partners from 12 different organisations. The topics queried were the following:

1. Data Privacy and Data Protection
2. Application of AI

3. e-Wallet
4. Roadmapping
5. Assessment Tool
6. ID Verification Service
7. Remote qseal Service for Verifiable Credential
8. Decentralized Identity Management Solution compliant with the European Self Sovereign Identity Framework (EBSI/ESSIF) focused on Public Administrations
9. Enrolment and Authentication to Access online Public Services
10. Guideline on how to handle Needs and Concerns of Stakeholders
11. SSI at the Core of a User-Centric eID Approach

The interest in the different topics is illustrated in Figure 5.

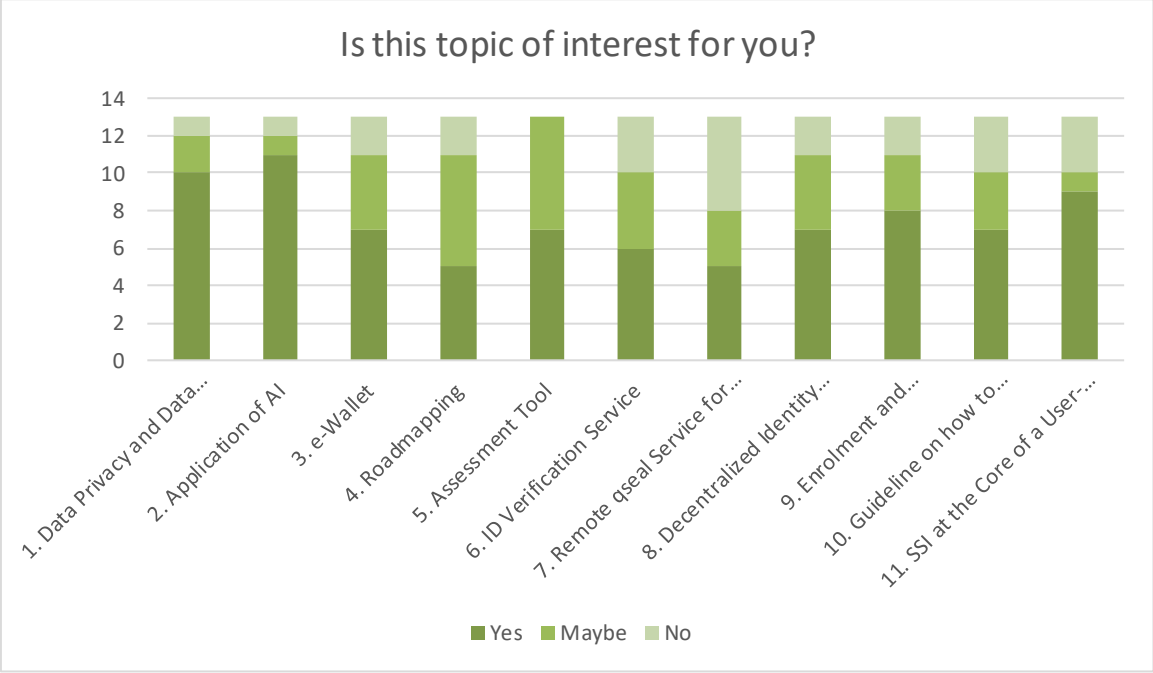


Figure 5: Interest in the suggested standardization topics queried by a survey.

For the different topics it was also inquired what the challenges in this topic with regard to IMPULSE are. The topics are described in the following a little more detailed and the answers for the individual topics are analysed.

1. Data Privacy and Data Protection

This topic includes consent management in general, icons which simplify the consent management process for the user but also the topic of smart contracts.

The IMPULSE project adopts a SSI approach, meaning that the user is the sole detainer of his/her personal data and of the consents he/she gives to use and/or detain them. The problem is that from one hand understanding the consents he/she is giving, from the other hand managing the consents is not easy at all. To overcome this difficulty CEL has developed a set of icons that will help the user to visually and so immediately identify the main points of the data consent form through a contract between the subject and the service provider. Furthermore, these icons will be integrated into an app that the user will have the possibility to use to manage his/her consents: see what consents she/he has given and to what organizations, revoque fully or partially the consents, etc.

This topic was classified as interesting by 10 partners and as maybe interesting by two. Most partner used the opportunity to comment on this topic. It was mentioned that such a standard would ensure the correct

understanding of data use / protection including the right meaning / understanding of the set up icons. The interest in in inclusion and accessibility was mentioned as well as the challenge to design a consent form that provides the rights of the citizen who are using solutions like IMPULSE clearly. Another aspect in that context is to ensure that the user understands the implication of their consent including GDPR aspects and also the understanding that the consent is managed exclusively by them in a decentralized way by smart contracts. In that context a challenge is to have a balance between the usability and the provided information

2. Application of AI

This topic covers the application of AI in the context of face recognition and / or document verification. However, you can also suggest other topics related to the application of AI.

This topic was classified as interesting by 11 partners and only for one it is not interesting. Most of the partner also used the chance to comment on this topic. The challenges listed are how to define metrics for the evaluation or how to exchange which information. The assurance of ethical applications of AI in the mentioned context and the constant advance of this technology with the changes that it implies were added. One challenge in that regard for IMPULSE is also to have an effective face recognition from a small group of data / documents to train the algorithms The question of the waste of biometric information when the user has to provide his face profile for each identification was also raised. The problem with twins was also mentioned as well as the detection of physical forgery of the ID documents. Another challenge is to avoid biases connected to the application of AI to biometric data. With regard to the onboarding the difficulty to verify that a person is indeed the holder of a particular identity document was mentioned.

3. e-Wallet

The user wallet is a module within the mobile (end user) app that stores and provides an interface to make use of the cryptographic material needed to interact in the SSI environment (DIDs, key pairs, VCs, VPs).

The enterprise wallet is a module within the Enterprise Service that stores and provides an interface to make use of the cryptographic material needed to interact in the SSI environment (DIDs, key pairs, VCs, VPs).

This topic covers the envisioned wallet functions and ways to avoid fragmentation.

This topic was classified as interesting by seven partners whereas two are not interested in such a topic and the rest was unsure about it. Nearly half of the partners who answered the survey provided some further comments on this idea. It was suggested to combine the e-wallet with other digital services. It was mentioned that there are already ongoing standardization activities and that it would be interesting to analyse if the IMPULSE solution meets those requirements. In this context it was also mentioned that the relationship between ongoing standardization processes and their alignment with existing regulations like eIDAS1, eIDAS2 and/or GDPR would be interesting. Further it was suggested to standardize a fast, usable and interoperable service in the context of the e-wallet and the SSI identity model. It was also suggested to standardize the private key management / storage since there could be problems with smartphones and also public administrations with the required types of hardware. Further issues raised in that context were the transferability of data from one device to another, the user control and the conformity with European regulations.

4. Roadmapping

This topic covers the process of writing a roadmap from the preparation phase to the writing phase with regard to a high level of quality.

The topic of roadmapping was classified as interesting by five partners whereas six were unsure about it and for two it was not interesting. Further comments were added by 5 partners. With regard to standardization, it was considered as interesting how to elaborate a roadmap. The issue sufficient data for roadmaps to be relevant and reusable were raised as well as the coverage and dimension of all relevant topics. Producing a roadmap that is truly valuable for new experiments on SSIs in a European but also national context by considering existing environments and technologies by showing the improvement compared to the incumbent and its roadmap were mentioned as a challenge.

5. Assessment Tool

This assessment tool is for analysing if a solution like IMPULSE would be suitable for different PA services.

This topic is the only one where no one has expressed no interest in this topic. Instead, nearly half of the partners rated this topic as maybe interesting and the others as interesting. Ten people provides further input with regard to the challenges of that topic. According to the answers it should be ensured that such a tool is sufficiently exhaustive and comprehensive in its assessment but also provides an understandable output. A standard for such tools should include a definition of metrics, group of users, questionnaires and so on. It should be able to analyse the public administration backends, datacentres, types of services, available hardware and identify the minimal requirements of solutions like IMPULSE. Such a tool should also analyse how a solution like IMPULSE is accepted by the general public, not only by computer literates but also by other people like older or vulnerable ones. It was pointed out that a conceptual framework or some loose grid evaluation in the context of an assessment tool would be valuable but also that the public administrations itself have to decide about the usefulness of a technology like IMPULSE. A challenge mentioned was also the adaption of a solution like IMULSE to the different public administration and contexts. The question was also raised as to whether it is possible to standardize something like this and to whom the solution serves over and above others. It was also added that such an assessment tool is developed within the ETAPAS project. This is also where this idea originally came from.

6. ID Verification Service

A service to assess that an ID document is genuine. Digital image processing techniques are implemented by using state-of-the-art optical character recognition (OCR) methodology utilising convolutional neural networks to read the document text, the Lvenshtein distance to contrast it to user-provided information, a features extraction technique, a clustering method to detect copy-move forgery and one-class classification models to detect character morphology forgery.

The topic of ID verification services is interesting for six people, maybe interesting for four and not interesting for three. Five answers were given with regard to the challenges within this topic. The question was raised how to define the metrics and exchange information with other systems. The difficulty to get a high volume of ID documents to train the AI was also mentioned in that context as well as the challenge to detect physical forgery of the ID documents. Another challenge is to avoid the human intervention in the ID verification process which was also identified as the weakest link within the verification process.

7. Remote qseal Service for Verifiable Credential

The service will be used for remote digital sealing of VCs, in the context of a Self-Sovereign Identity issuing service implemented in IMPULSE based on EBSI-ESSIF infrastructure.

Sealing VCs with an eIDAS compliant service will enhance the trustworthiness of issued credentials, responding to the requirements of the IMPULSE project where the technology is applied to public services.

This topic was rated by five partners as interesting and by the same number as not, whereas three were unsure. Two answers were given with regard to the challenges within this topic. On the one hand the remote key management and storage could be one. On the other hand, it was considered as interesting to explore the questions if there is a possibility to prevent that a change in the regulation will entail a change in the technology.

8. Decentralized Identity Management Solution compliant with the European Self Sovereign Identity Framework (EBSI/ESSIF) focused on Public Administrations

A modular and ESSIF-compliant decentralized identity management solution for the purposes of users registration and authentication with online services. The solution consists of two main components:

(1) an User Mobile Application that provides European citizens a digital wallet to securely store and hold their identity attributes as defined in ESSIFv2 and

(2) an Enterprise Service that provides legal entities or relying parties (at the moment only Public Administrations) the capability of acting as a Trusted Issuer and/or Verifier of users' identity attributes following the ESSIFv2 specifications.

Both components can be easily integrated with biometric and document verification modules from different third parties to ensure both registration and authentication processes.

This topic was rated as interesting from seven partners, whereas four voted for maybe and two for not interesting. Five answers were given with regard to the challenges. In this regard the integration mechanism, the deployment of the service to different public administrations and the passing of the regulatory hurdles

mainly security were mentioned. The integration with different cryptographic hardware modules was mentioned together with the aim to develop User Mobile Application so it can be used by the maximum number of devices possible and in the most accessible way possible. In this context it was mentioned that one should be aware of the ongoing standardization activities related to decentralized identity management and that it would be interesting to analyse whether the IMPULSE solution meets the requirements of the ongoing standardization processes from a technical point of view. The interest in a relationship between the ongoing standardization processes and their alignment and compliance with regulations such as eIDAS1, eIDAS2 and/or GDPR was raised.

9. Enrolment and Authentication to Access online Public Services

By combining three existing and disruptive technologies, namely Artificial Intelligence (AI), Blockchain (BC) and Smart Contracts (SC), IMPULSE aims to transform the two critical processes required to access the online public services: enrolment and authentication. These are the same two basic workflow or scenarios considered for the design and implementation of the IMPULSE eID-solution.

This topic was rated by eight partners as interesting, three as maybe interesting and two as not interesting. Seven partners answered for the challenges. Using AI in this context entails to assess to what extend it is reliable and if citizens trust it. The important question there is how to do that. The question if SC's are a stand alone disruptive technology was also raised. The security of the process is another issue as well as making it easy to understand by the users (self-explained). Other challenges are the onboarding and the liability as well as smoothness of the process. Also, in this context the importance of the relation to ongoing standardization initiatives was pointed out as well as the alignment with regulations.

10. Guideline on how to handle Needs and Concerns of Stakeholders

Each stakeholder group has a unique set of needs and concerns, which shall be addressed by the IMPULSE eID solution. The needs and concerns are different than simply listing anything that the stakeholder "wants": It should refer to the goals that the stakeholder wants to achieve (the jobs-to-be-done) and should be technically, legally, and ethically feasible to achieve those intended goals. Unlike software requirements, the needs and concerns belong to the problem domain.

This topic was voted as interesting for seven partners. For three it was maybe interesting and the same number for not interested. Three partners provided input to the challenges. One challenge mentioned is to concentrate on the most relevant issues. Further focus groups, interviews and workshops needs to be organized in order to understand those concerns. In that context it is important to ensure the sufficient collection of needs by taking into account the difficulty of the actors themselves to sometimes define these needs. At the end a solution has to be defined that meets them as closely as possible.

11. SSI at the Core of a User-Centric eID Approach

Unlike other centralized eID systems like the ones based on user/password or federated identities (i.e., Facebook, Google, LinkedIn…), IMPULSE proposes a secure and privacy preserving alternative for existing eID management systems, being the self-sovereign identity (SSI) concept at the core of the user-centric IMPULSE eID approach.

This topic is of interest for nine project partners, maybe interesting for one and not interesting for three. Five answers with regard to the challenges that comes along with such a topic were received. The general adoption of SSI throughout Europe was mentioned as well as communicating the advantages of such a solution to the citizens. A problem may be that the users do not perceive the added value of an SSI model. Therefore, the awareness has to be raised on privacy and data ownership but that does not automatically assure that the SSI is perceived as the best solution. Further questions which were raised in that regard are if the user is able to manage his/her own personal data and to know in each moment to what extent personal data is shared and needed. It was added that some users will accept the new technology well and will be keen to use it, but others might have problems in learning to use the disruptive technology. In that regard it is interesting how to deal with the ones who are not so easy to learn.

3.2.1.4 Standardization potential workshop – part 2

The second part of the standardization potential workshop was performed on 15th July 2022 with 23 participants. To this standardization session the DIN project manager who is responsible for mirroring activities for CEN-CLC/JTC19 and the UNE secretary for UNE-CTN71/SC307 were invited to give an overview on the standardization activities related to blockchain and distributed ledger technologies. After that session an overview of the possibilities for R&I projects to participate in standardization activities was given (see A.1.6). Besides a theoretical explanation of the options on how to get involved as a project with standardization for possible liaisons three TC's on international and European level as well as their most relevant active work items for the IMPULSE project were presented (see Table 3).

Table 1: TC's for possible liaisons.

TC	Active work items* relevant for IMPULSE
ISO/TC 307 Blockchain and distributed ledger technologies	• ISO/AWI 7603 Decentralized Identity standard for the identification of subjects and objects • ISO/WD TR 23642 Blockchain and distributed ledger technologies - Overview of smart contract security good practice and issues
CEN/CLC/JTC 19 Blockchain and Distributed Ledger Technologies	• Decentralised Identity Management Model based on Blockchain and other Distributed Ledgers Technologies. – Part 1: Generic Reference Framework
CEN/TC 224 Personal identification and related personal devices with secure element, systems, operations and privacy in a multi sectorial environment	• European Digital Identity Wallets standards Gap Analysis • Personal identification – European guide for verification applications based on ID documents (EVG) • Personal identification —Use of biometric verification data across EU countries and scenarios

*The listed work items are the relevant ones at the time of the presentation.

Further, the results of the survey described in the preceding section were summarized and the project partner informed. For each topic already existing standardization documents as well as relevant standardization committees were presented. If possible, also the relation between ongoing standardization processes and their alignment with regulations such as eIDAS1, eIDAS2 and/or GDPR were presented.

Afterwards the work went on a Conceptboard (see A.1.7). There, the standardization ideas from the first part of the workshop were summarized including the results from the survey. The aim was to find for every topic from the survey some IMPULSE partners who have the expertise and the resources to lead the topic if a standard should be developed out of this idea. Only for the topics listed responsible persons or organisations were found:

- Data privacy and data protection
- Application of AI
- E-Wallet
- Roadmapping
- Assessment tool
- SSI at the core of a user-centric eID approach

Since the survey on those topics was not filled by all participants within the workshop and since some further input was given to those topics another voting was raised on the Conceptboard to determine the interest in the different topics. Most participants voted for "data privacy and data protection". The second highest votes were

given to the topics of "e-Wallet", "assessment tool", "enrolment and authentication to online public services" and "Guidelines on how to handle needs and concerns of stakeholders". The next step was the in-depth development of the standardization ideas for the most voted ones to ensure that these ideas really have the potential to be developed into a standardization document and to become aware of the possible content of such a standard. For this purpose, the following questions should be addressed which are also the basis to draft a proposal for a CWA:

- Which activity (work package, deliverable, solution) forms the basis for this proposal?
- Which challenge should be tackled by developing a specification?
- Why is this topic also important for other stakeholders?
- What is already on the market and how does the envisaged specification differ from it?
- Scope: What is the specification about?
- Scope: Who is the target group of this specification?
- Which elements need to be included in the specification?

Due to time issues that part was only started for the highest rated idea on "data privacy and data protection". As the activities which form the basis for such a proposal WP5 – *Technology research, evaluation and integration* as well as the deliverables D5.4 – *IMPULSE wallet – V2*, D1.3 - *Data Management Plan (DMP) - V1* and D4.1 – *Report on social perception and recommendations - V1* were listed. The challenges which should be tackled by developing a specification from these topics are that the management of consent must be easy for citizens, that genuine transparency over the data flows and data usages have to be given for the users and citizens and that they have the opportunity to modify and delete them. This topic is also important for other stakeholders since it would take into account existing regulations like GDPR or eIDAS. With regard to this topic there exist already some national and European laws and regulations like GDPR, CCPA, PIPEDA but also OECD recommendations and guidelines as well as standards like e. g. the ISO/IEC 27001 - *Information security management systems*. Regarding the elements which should be include in such a specification it was mentioned that secure elements like TPMs, HSMs and TEEs in both wallets – user and public administration – should be incorporated to duly protect the identity user information. It was added that it should be built on the lessons learned by the staff of the public administrations since they recruit and deal personally with the trial participants on the matter of privacy and protection. Due to the limited timeframe, it was not possible to discuss the individual questions to more extend.

Since several of the suggested topics seemed to be interesting from the view of the IMPULSE partners with regard to standardization those topics were combined resulting in two ideas which were followed up after the second part of the standardization potential workshop. This is described in the following subclause.

3.2.2 Standardization ideas from IMPULSE

Due to the relatively high interest in several topics with regard to standardization and the connection between some of them the topics were combined to provide for the IMPULSE consortium two standardization ideas where IMPULSE results can be exploited. Those ideas were "Application of AI and Blockchain in Used Cases - Identity Management in Public Services" and "Consent Management for eID Solutions".

The topic "Application of AI and Blockchain in Used Cases - Identity Management in Public Services" is a combination of the standardization ideas 2. Application of AI, 8. Decentralized Identity Management Solution compliant with the European Self Sovereign Identity Framework (EBSI/ESSIF) focused on Public Administrations, 9. Enrolment and Authentication to Access online Public Services and 10. Guideline on how to handle Needs and Concerns of Stakeholders. The topic "Consent Management for eID Solutions" is mainly about the standardization ideas 1. Data Privacy and Data Protection.

Within a poll the individual interest of the project partners, their wanted involvement in those standardization ideas as well as some input to those topics was queried. The poll was answered by 13 partners from 12 different organizations. The answers will be discussed in the following subclause.

During the discussions for new standardization ideas within the standardization potential workshops and also within the surveys the question came up if it really makes sense to initiate a new standardization document from the project side or if it maybe is the better option to include the project knowledge in already ongoing standardization activities since already a lot is ongoing in that direction.

3.3 Standardization potentials within IMPULSE

3.3.1 General

To receive feedback from the IMPULSE partners to the final two standardization ideas a survey was used (see Annex A.1.8). This survey was answered by 13 partners from 12 different organisations. In the following sections both standardization ideas are analysed in detail with the results from the survey.

Since the development of the content of such a specification must be developed by the experts it was important to get an impression by the survey on who would be available from the IMPULSE partners to contribute to the development and to what degree. The options provided were:

- Initiator of this specification: somebody who would like to take the lead on that topic
- Main contributor: somebody who would like to provide a lot of content to the targeted document
- Contributor: somebody who would like to provide some content to the targeted document
- Not at all: somebody who cannot provide content to the targeted document for diverse reasons

3.3.2 Application of AI and Blockchain in Used Cases - Identity Management in Public Services

3.3.2.1 Background information and motivation

The following text was used in the survey to describe the standardization potential for the project partners:

This idea is a combination of several topics which were rated as interesting during the standardization potential workshop. Within a specification with this topic, we could include the following items:

- *Assessment of requirements (needs and concerns)*
- *Potential solutions: Which solutions are the most suitable ones for public services?*
- *How to apply these solutions?*
- *different requirements of the city cases*
- *city cases as an example in the annex*

The advantage of this proposal is that most of the IMPULSE results can be integrated in one document.

3.3.2.2 Query of interest via a survey

The topic of the application of AI and Blockchain in Used Cases is of high interest within the IMPULSE consortium since 10 out of 13 participants expressed their interest in this standardization idea. This activity is mainly related to the activities in WP5 – *Technology research, evaluation and integration* but also to WP2 – *Co-creative design and piloting*. Since it is a quite broad topic it is based on the general knowledge developed within IMPULSE and would also include input from the other work packages.

The individual motivations for developing a specification on such a topic are quite different within the consortium. According to the responses given in the survey it would be a way of knowledge sharing, e.g. on how to apply solutions like IMPULSE. Further motivations are also the assessment of requirements, the use of AI for ID verification and that this could be a solution for public services. The standardization of smart contracts was also mentioned in this category as well as the use of AI for ID verification. Another motivation is to standardize privacy preserving and secure AI and blockchain applications. It was also mentioned that SSI is the future of the eID systems and that the growing of AI in every technological field is immense.

With regard to which challenges should be tackled by developing this topic into a standardization document it was mentioned that one would be how to make AI trustworthy, explainable and reliable. One focus should also be to facilitate the citizenship procedures with the public authorities which would definitely save time. Another challenge is to ensure that those applications are secure and privacy preserving. It could also address the lack of a common method for creating smart contracts. It was also pointed out that the IMPULSE solution is basically a system self-sufficient solution that has the same form independent of the six case studies. Therefore, the cases have each very different requirements coming from their users which is why the challenge lies in finding a common thread for all cases that can be standardized. It was also suggested to modify the topic to

"SSI and AI" instead of "Blockchain and AI" since it could be easier to link SSI and AI. It was added that SSI can use Blockchain or any other DLT as the Verifiable Data Registry. One main challenge seen here was to be able to specify requirements of the AI so the user does not lose sovereignty over their identity or decentralization over the process of getting it.

The benefits to have a specification on this topic are related to those points mentioned when asked for the individual motivation. Knowledge sharing and also comparability of efficiency beyond case studies and their reproducibility were mentioned. Such a specification could also be the basis for system certification in terms of reliability, accuracy or privacy for example. Such a specification would also help to avoid fragmentation and to facilitate interoperability. It would also provide the opportunity to have a common ground regarding the creation of smart contract procedures. It was also highlighted that this topic would be something that has not been addressed before.

Among the target group of such a specification would be the following:

- IT-developers
- operators on the technical implementation level
- Our own project group
- other development departments in Aarhus Municipality
- AI experts
- Authorities and public administration
- private sector
- Citizens
- eID SSI system developers
- AI developpers

With regard to the importance of this topic for other stakeholders it was mentioned that this would have the potential to improve the data security in public services. Further such a specification would facilitate the relationship from stakeholders with the public authorities. It further would speed up the development of these type of systems as they will not face the same problems like within the IMPULSE project. It was pointed out that especially for non-experts in those topics it could be quite advantageous to have a common quality standard in which the best practices are listed.

The survey also asked what should be included in the scope of a specification in this topic area. It was mentioned that the integration and implementation of solutions like IMPULSE should be within the scope as well as how to facilitate such procedures. The usability and inclusivity requirements were also mentioned to take into account within the scope. Further, validation mechanisms and metrics for AI models should be tackled. In this regard also precision requirements for AI are relevant. The way of providing the functionalities like remote service and local modules as well as authentication mechanism in case of accessing the functionalities via remote service should be considered. Further possible elements of such a specification could be the characterisation of data sets for training, testing and validation as well as the user experience. How to maintain a safe interaction with public authorities was mentioned as a possible further element. As other points it was suggested to include the response time and to also take the accessibility into account when specifying requirements to take e.g. images or videos. The inclusivity of the described model is another point that could be included. To set the scene, the question was also asked as to what should not be explicitly included in such a specification. In this regard it was mentioned that it is important to not generally assume that the user needs are the same. Further, the individual integration and deployment of the solution should not be part of this specification.

Within the last question to that topic in the survey the willingness of the partners was queried to participate in the development of such a standard. Nobody offered to be the initiator of this specification or a main contributor but 9 out of 13 indicated that they would like to contribute whereas two were unsure on how to participate and 2 did not want to participate at all.

3.3.2.3 Related IMPULSE results

A follow up of this idea would provide the opportunity to put a lot of the IMPULSE learnings into a standard. Despite a framework on how to use best SSI and AI for identity management solutions the integration and

implementation of solutions like IMPULSE would be in the focus of such a standard document. The different opinions on what to integrate in a standard on that topic is listed in detail in the previous subclause. Since within the IMPULSE project a new identity management solution is developed and also tested within different used cases the expertise for developing such a standard is present within the consortium.

3.3.2.4 Related TC's and standards

In relation with the topic "Application of AI and Blockchain in Used Cases - Identity Management in Public Services" the TC's listed in Table 1 are relevant which were also identified as the relevant ones for possible liaisons.

No standards or ongoing standardization activities were identified which cover the topic of AI in the context of decentralised identity management. Further, no specific standards with regard to AI and the alignment to regulations such as eIDAS1, eIDAS2 and/or GDPR were identified. In contrast the active work items within CEN/TC 224 (see Table 1) were identified as important for IMPULSE and also the topic identity management in public services:

- European Digital Identity Wallets standards Gap Analysis
- Personal identification – European guide for verification applications based on ID documents (EVG)
- Personal identification – Use of biometric verification data across EU countries and scenarios

With regard to relevant standards and ongoing standardization activities attention was drawn to the following documents. From CEN/TC 224 the standards CEN/TS 16634:2014 *Personal identification - Recommendations for using biometrics in European Automated Border Control* and CEN/TS 17661:2021 *Personal identification – European enrolment guide for biometric ID documents (EEG)* were mentioned as relevant in the context of decentralized identity management. A relation to the decentralized identity management has the standard UNE 71307-1:2020 *Digital Enabling Technologies. Decentralised Identity Management Model based on Blockchain and other Distributed Ledgers Technologies. Part 1: Reference Framework.* This standard will be converted into a European standard by CEN/CLC/JTC 19. Further relevant standards are the EN 419212-series on *Application Interface for Secure Elements for Electronic Identification, Authentication and Trusted Services* and also ISO/IEC 23220-series on *Cards and security devices for personal identification - Building blocks for identity management via mobile devices* which is still under development and where the first part on *Generic system architectures of mobile eID systems* was just published in February 2023.

3.3.2.5 Pursuit of the potential

Since within the survey on the interest for this standardization idea nobody offered to be the initiator or a main contributor of a potential CWA a meeting was held were the 10 interested partners in that topic were invited. Within this discussion it was stressed out that due to the variety of already ongoing standardization activities it makes more sense to contribute to those then to develop a new standardization document from IMPULSE side. The contribution to ongoing standardization within IMPULSE is described in section 4. One year later, in September 2023 the project partners were asked via a survey (see A.4) if from their point of view at the current point of the project this is still a topic where it would be useful to have a standard for. From 13 partners 12 answered this question with "yes" and stated that this would serve as a base for future eID implementations and extensions of the concepts and that the focus on the used cases would be very valuable for other projects. Contrary, it was also mentioned that such a focus on the used cases might be limited to only few experiences and that therefore not all the aspects of a specific topic could be covered. In favour of such a standard it was stressed that technology standards are separated and sometimes does not take into account specific related needs which could be covered by such a standard. In this context it was also added that such a standard should be implemented in such a manner that it supports and broadens the involvement of the technical developers in the development domain in question.

3.3.3 Consent Management for eID Solutions

3.3.3.1 Background information and motivation

The following text was used in the survey to describe the standardization potential for the project partners:

This topic includes consent management in general for eID solutions like IMPULSE but could further include the following items:

- *ensuring the correct understanding of data use/protection*
- *usage of icons for simplifying the consent management process for the user*
- *smart contracts in general*
- *consent forms providing clearly the rights of the citizen who uses eID solutions like the IMPULSE service*
- *achieving a perfect balance between usability and giving to the user all the information that he/she legally must have*

3.3.3.2 Query of interest via a survey

The topic of Consent Management for eID solutions was indicated as interesting for seven out of 13 partners who filled the survey. The basis for this activity is formed by WP3 – *Multidisciplinary analysis of standards, legal and ethical implications* but also by WP5 – *Technology research, evaluation and integration*, WP4 – *Socio-economic/political impact analysis* and WP2 – *Co-creative design and piloting*.

The individual motivations or interests for developing a specification on such a topic is diverse. The partner CEL is involved in the development of the icons set which is why they would be interested in developing such a specification. The lack of an integrated visual standard and the low understandability of privacy policies as well as user satisfaction were mentioned. It was also stated that there is a lack of an integrated visual standard and a low understandability of privacy policies. The consent management in a decentralized way via smart contracts was also classified as an interesting topic. To elaborate a comprehensible visual language which makes it possible to understand the particular content quickly, clearly and intuitively is also in the interest of the partners. The recording of an automatic, privacy preserving and secure mechanism to manage the informed consent is also seen as interesting. Another individual interest mentioned is to ensure one's own understanding of the principles and their retribution when addressing the topic with interlocutors from the IMPULSE project.

When developing a specification out of this topic the challenge of user satisfaction should be tackled as well as to make the consent management quickly and easily understandable. The challenge is to make it easier for the citizens not only to manage informed consent but also to understand its content. Since people have different biases for their interpretation, different levels of knowledge as well as interests related to technology and law, data protection and so on one cannot rely on a visual language being understood in the same way by everyone. Therefore, this would require profound testing. When developing the standardization document, it must be ensured that in doing so not only another concept is added to the pile of already complex ones. One challenge is that that nothing registered over a blockchain can be deleted which is especially in terms of GDPR problematic and therefore poses a main challenge to solve the privacy issues.

Within the benefits in general to have a specification on that topic, the general information for citizens is considered as well as the advantage to have a standardized common ground regarding visual cues. Such a specification would allow to have a clear and precise understanding by all and for all. Since this topic is at the moment still quite unexplored it would allow to simplify the consent management process for the user as well as in general for smart contracts. Therefore, it provides the certainty of having everything done that should be done to ensure the people's rights on such a sensible matter are fully respected.

The target group of such a specification would include

- Citizens
- Policy makers
- Graphic designers
- Privacy associations
- Management system developers
- GDPR specialists
- End-users
- IT developers
- Content creators

- The public and private sector.

It was remarked that no particular group should be excluded regardless of their understanding and level of expertise on the issue. With regard to the question on why this topic is also important for other stakeholders it was mentioned that one has to ensure an easy-to-understand content since this specification is then advantageous for everyone. For non-experts in those topics, it could be quite advantageous to have a shared way of dealing with a visual representation of a privacy policy. Besides the already mentioned stakeholders such a specification could be also interesting for protection agencies and enforcement agencies.

With regard to the possible content of this specification the project partners were asked what should be part of the scope. With regard to the icons, it would be necessary to determine which elements should be mandatory as well as to understand and link them with the specific content of a privacy policy. Further, the information that can be registered in the smart contracts have to be defined. In that context anonymisation techniques as well as how the transactions to invoke the smart contracts should be signed. The explicit data management procedure is another part of the scope. Further elements of such specifications could be blockchain networks which allow to handle consent management in smart contracts. There was nothing mentioned on what should explicitly not be part of such a specification.

When asked on the kind of contribution the individual project partners would like to provide for this topic seven partners answered that they would like to contribute to that topic, and one was unsure about it. Nobody offered to be the initiator of the specification or a main contributor.

3.3.3.3 Related IMPULSE results

Within IMPULSE the topic of obtaining consent is important for the IMPULSE app. Since smart contracts are used a lot of knowledge and experience from the project could be feed into a standardization document in that regard.

3.3.3.4 Related TC's and standards

The topic of consent management is quite broadly distributed among the different TC's on European and international level since consent management always has a relation to another topic. So, there is no specific TC covering the topic of consent management in general. There are several standardization documents related to consent management which could be also interesting in the context of IMPULSE:

- CWA 17525:2020 Elements of fair and functioning data economy: identity, consent and logging
- IETF RFC 5361:2008 A Document Format for Requesting Consent
- ISO/IEC 29184:2020 Information technology - Online privacy notices and consent

With regard to decentralized identity management especially the UNE standard UNE 71307-1:2020 *Digital Enabling Technologies. Decentralised Identity Management Model based on Blockchain and other Distributed Ledgers Technologies. Part 1: Reference Framework* have to be mentioned. This standard should be converted into a European standard - *Decentralised Identity Management Model based on Blockchain and other Distributed Ledgers Technologies. – Part 1: Generic Reference Framework* - and is therefore at the moment under drafting from CEN/CLC/JTC 19. In May 2023 ETSI GR PDL 019 V 1.1.1 - *PDL Services for Decentralized Identity and Trust Management* was published which could be also important in that context.

3.3.3.5 Pursuit of the potential

Since within the survey on the interest for this standardization idea nobody offered to be the initiator or a main contributor of a potential CWA a meeting was held where the seven interested partners in that topic were invited. Within the discussions it turned out that the resources for leading this topic as an initiator for a CWA were not available within the consortium. For this reason, the standardization idea was discarded. One year later, in September 2023 the project partners were asked via a survey (see A.4) if from their point of view at the current point of the project this is still a topic where it would be useful to have a standard for. From 13 partners 12 answered this question with "yes" and highlighted that it would be good to have common icons and forms in different eID solutions. It was also stated that the consent management is challenging, and a standard would facilitate its application. In that context another person stated that the GDPR laws are very important and strong so that in order to be compliant and transparent a standard regarding this topic seems a

good option. In this regard it was also added that everything that can provide a perfect balance between usability and giving to the user all the information that he/she legally must have would be extremely useful. Further it was mentioned that consent is a universal issue for any such solution and that standardization helps both to lower effort and costs in addressing this as well as can safeguard the citizens from ethically questionable innovations. With regard to the experiences in IMPULSE one participant stated that such a standard is definitely needed as the main concerns of participants was in data use and its protection, so having a standard would facilitate the IMPULSE and other eID solutions following the same standards to ensure it and therefore be able to explain it to end users. The one participant who stated that such a standard is not necessary explained that the existing regulatory instrument suffice in ensuring common standards of practice.

4 Contribution to on-going standardization activities within IMPULSE

4.1 General

Within the DoA one KPI within the standardization task is the development of one standard, e.g. CWA. Despite the identification of two standardization potentials, it was refrained from developing a standard from these potentials (see 3.3.2.5 and 3.3.3.5 for explanation). This modification was integrated in an amendment (No AMD-101004459-18) by changing the development of one standard to contribution to standardization activities. Due to that change resources for this task were returned to the project.

Within the workshops and surveys, it was already pointed out that the participation in ongoing standardization activities would be within the interest of the IMPULSE consortium. The participation in WG's of TC's only makes sense if there are currently active work items, where the R&I project has the expertise to add valuable content and where an integration of project results appears to be likely. The approach is described in the following clauses.

4.2 Relevant standardization activities

Within deliverable D3.4 an overview of relevant TC's for IMPULSE as well as their current work items on European level was provided. In Table 1 TC's for a possible liaison from the IMPULSE point of view are listed. The first one is ISO/TC 307 - *Blockchain and distributed ledger technologies*. Since the workshops the number of active work items increased, which is why they are listed in Table 2.

Table 2: Active work items from ISO/TC 307.

ISO/CD TR 6277	Blockchain and distributed ledger technologies — Data flow model for blockch
ISO/AWI 20435	Representing Physical Assets using Non-Fungible Tokens
ISO/FDIS 22739	Blockchain and distributed ledger technologies — Vocabulary
ISO/AWI TS 23516	Blockchain and Distributed Ledger Technology — Interoperability Framework
ISO/WD TR 23642	Blockchain and distributed ledger technologies - Overview of smart contract security good practice and issues

Due to the fact that IMPULSE is a European R&I project with European pilots the focus was more on the interaction with European TC's. There were two relevant TC's on European level identified which are of interest for the IMPULSE project with regard to establishing a liaison: CEN-CLC/JTC 19 - *Blockchain and Distributed Ledger Technologies* and CEN/TC 224 - *Personal identification and related personal devices with secure element, systems, operations and privacy in a multi sectorial environment*. In the following besides general information on them, the interaction with both TC's is described. Within D3.4 the liaison activities with UNE CTN 71/SC 307 - *Blockchain and distributed ledger technologies* were described. A summary and an update of those activities can be found in the following subclauses.

4.3 Interaction with relevant standardization committees

4.3.1 Presentation of IMPULSE to CEN-CLC/JTC 19

CEN-CLC/JTC 19 was created on the basis of a white pater from 2018 with the aim to identify and adopt international standards already available or under development. Therefore, it works in close contact with

ISO/TC 307 - *Blockchain and distributed ledger technologies.*[7] The scope of CEN-CLC/JTC 19 is to prepare, develop and/or adopt standards for Blockchain and Distributed Ledger technologies covering the following aspects:

- Organizational frameworks and methodologies, including IT management systems;
- Processes and products evaluation schemes;
- Blockchain and distributed ledger guidelines.

The JTC will focus on European requirements, especially in the legislative and policy context, and will proceed with the identification and possible adoption of standards or other relevant documentation already available or under development in other SDOs or regulatory bodies, which could support the EU Digital Single Market and/or EC Directives/Regulations. Special attention will be paid to ISO/TC 307 standards. If required these standards will be augmented by CEN TRs and TSs.[8] The JTC consists at the moment only of one working group CEN-CLC/JTC 19/WG 01 - *Decentralised identity management*.[9]

At the moment there is one active work item which is on Decentralised Identity Management Model based on Blockchain and other Distributed Ledgers Technologies. – Part 1: Generic Reference Framework. This work item is based on the UNE 71307-1 standard where also IMPULSE partners were involved in the discussion of the content (see deliverable D3.4). The convenor of this JTC was contacted and the IMPULSE project was presented by Madlen Schmudde (DIN), Xavier Martinez (GRAD) and Javier Gutiérrez (TREE) at the CEN-CLC/JTC19/WG01 meeting on 30th November 2022. The working group was interested in the work of the IMPULSE project and questions for further information to the project were also raised. The convenor Ignacio Alamillo-Domingo said afterward that contributions from the IMPULSE project to the active work item are more than welcomed. Unfortunately, no information was ever received on how to do that best. Nevertheless, he participated in the Spanish IMPULSE workshop from WP 6 in January 2023 and suggested there that IMPULSE should definitely get involved within CEN/TC 224.

Regarding the above mentioned project based on the UNE 71307-1 it was decided by the WG that this item is abandoned due to lack of contributions, overlap of work with other forums (incl. ISO/IEC JTC1/SC17, ETSI ESI) and time issues. Therefore, interactions with other standardization committees remain of high relevance.

4.3.2 Liaison with CEN/TC 224

CEN/TC 224 was set-up in 1989 and the scope developed and changed with time. It now has the scope to develop standards for strengthening the interoperability and security of personal identification and its related personal devices, systems, operations and privacy in a multi sectorial environment. It covers:

- Operations such as applications and services like electronic identification, electronic signature, payment and charging, access and border control;
- Personal devices with secure elements independently of their form factor, such as cards, mobile devices, and their related interfaces;
- Security services including authentication, confidentiality, integrity, biometrics, protection of personal and sensitive data;
- System components such as accepting devices, servers, cryptographic modules.

CEN/TC 224 multi-sectorial environment involves sectors such as Government/Citizen, Transport, Banking, e-Health, as well as Consumers and providers from the supply side such as card manufacturers, security technology, conformity assessment body, software manufacturers.[10]

[7] https://www.cencenelec.eu/areas-of-work/cenelec-sectors/digital-society-cenelec/emerging-technologies/

[8] https://standards.cencenelec.eu/dyn/www/f?p=205:7:0:::FSP_ORG_ID:2702172&cs=148F2B917E4B67BCFD6FE36CE0EA923AC

[9] https://standards.cencenelec.eu/dyn/www/f?p=205:29:0:::FSP_ORG_ID,FSP_LANG_ID:2702172,25&cs=16E2ADC46E2536C73D74C407A6FE4B3FD#1

[10] https://standards.cencenelec.eu/dyn/www/f?p=205:7:0:::FSP_ORG_ID:6205&cs=1E59B4D3EFD280E27AAC0C16CC13CD4FD

CEN/TC 224 has five active working groups (see Figure 6) where the most interesting ones for IMPULSE are WG18 – *Biometrics* and WG20 – *Ad Hoc Group on European Digital Identity Wallets.*

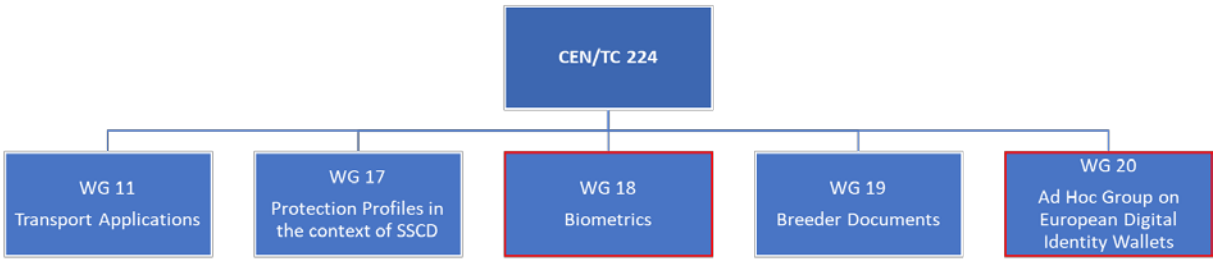


Figure 6: Structure of CEN/TC 224.

IMPULSE was presented on the CEN/TC 224 plenary meeting on 24th November 2022 by Madlen Schmudde (DIN), Xavier Martinez (GRAD) and Kais Dai (TREE). The feedback received was positive and it was agreed that it makes sense to propose a liaison. The liaison was accepted in March 2023 and then established by signing the contract. Access to all the documents from the TC as well as WG18 and WG20 was possible from midst June 2023. As a representative for the liaison from the project Madlen Schmudde was designated. For the liaison representative it is possible to access all the documents from the TC and the WG's and to participate in their meetings. Therefore, Madlen Schmudde (DIN) participated in the 60th meeting of CEN/TC 224 on 27th and 28th November 2023.

Within an update on the standardization activities for the IMPULSE consortium in July 2023 the activities within CEN/TC 224 with focus on WG 18 and WG20 were presented to the consortium. 10 partners participated in that virtual meeting. Detailed information can be found in the following sections.

4.3.2.1 Liaison with CEN/TC 224 WG 18

Within CEN/TC 224 WG 18 the focus is on Biometrics. This is of high relevance for the IMPULSE project due to the biometric authentication mechanism developed and uses within the IMPULSE app. Within the liaison period there was only one meeting of WG 18 in September 2023 where a participation of Madlen Schmudde (DIN) as a committee observer was not possible due to time issues. There are already 10 standards which were published directly by this WG. Amongst them also CEN/TS 16921 - *Personal identification - Borders and law enforcement application profiles for mobile biometric identification systems* which was discussed due to its high relevance for IMPULSE in deliverable D3.4 (see also clause 5). For a liaison the most interesting aspect are the active work items within a WG since the content of them is discussed within the WG and they are at different stages open for comments which offers the opportunity to include contributions from the project in these standards. The active work items from CEN/TC 224 WG 18 are listed in Table 3.

Table 3: Active WI within CEN/TC 224 WG 18.

CEN/TR 18030	Personal identification - Biometrics - Overview of biometric verification systems implemented across Europe	Under Approval
WI=00224273	Biometric data injection attack detection	Under Drafting
WI=00224275	Personal identification – Usage of biometrics in breeder documents	Preliminary
WI=00224277	European requirements for biometric products - Part 1: General requirements and application profile definition	Preliminary

WI=00224278	European requirements for biometric products – Part 2: Interoperability tests	Preliminary
WI=00224279	European requirements for biometric products – Part 3: Functionality evaluation methodology	Preliminary
WI=00224280	European requirements for biometric products – Part 5: Face biometrics	Preliminary
WI=00224271	Personal identification - European guide for biometric recognition applications based on ID documents (ERG)	Under Drafting

The scope of the PWI was presented to the consortium within the presentation "Update on standardization" in July 2023. In that context it was also queried for each work item if that could be relevant for IMPULSE and who would like to comment on the work item on behalf of the IMPULSE project. The relevance for IMPULSE (0 – not relevant, 5 – highly relevant) was assessed quite high (over 4) despite for the WI on the usage of biometrics in breeder documents (Figure 7). With regard to submitting comments for the individual work items the engineers from ALiCE biometrics offered to have a closer look on all those documents since ALiCE is responsible for the biometric part within IMPULSE. Furthermore, the ALiCE biometrics solutions integrated in IMPULSE went through an assessment by NIST (National Institute of Standards and Technology)[11], an official standardization body from the US, which is a federal agency that develops and promotes standards for science and technology.

For the work item on Personal identification — European guide for verification applications based on ID documents also two other partners offered to have a look at them to possibly submit some comments from IMPULSE to the drafts.

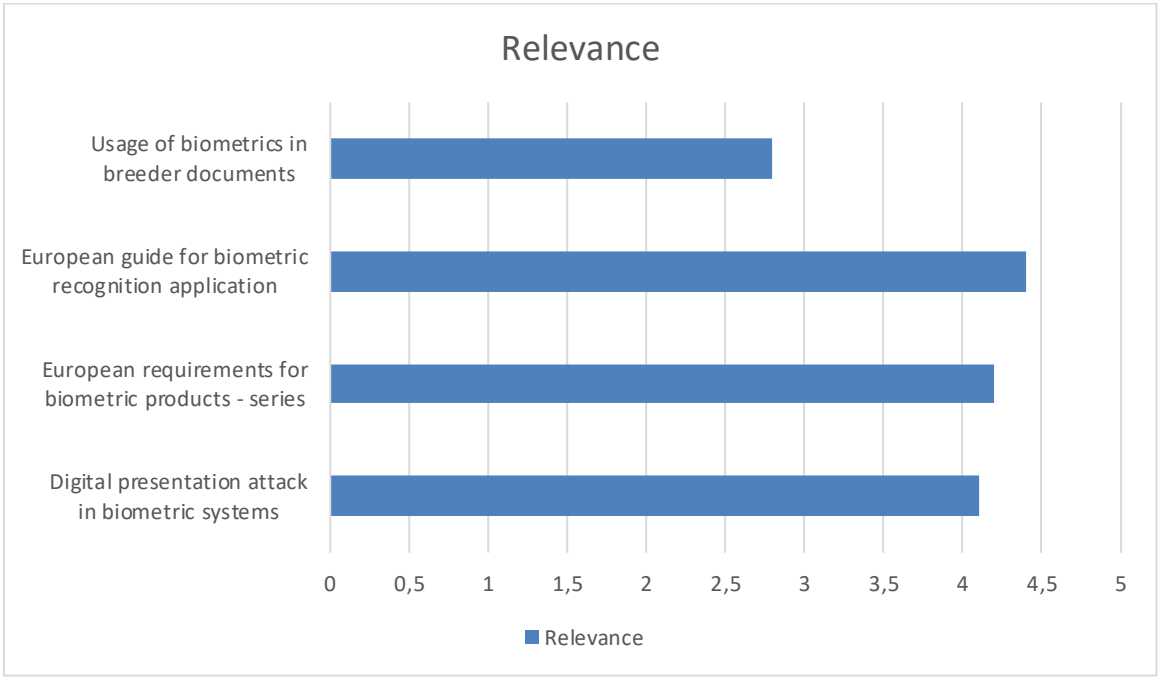


Figure 7: Relevance of the active work items for IMPULSE (0 – not relevant, 5 – highly relevant).

Unfortunately, direct input to the listed work items was not provided from IMPULSE to CEN/TC 224 WG 18. Nevertheless, the relation and relevance of those documents was evaluated by ALiCE's team of engineers:

[11] https://ALiCEbiometrics.com/en/what-is-nist-and-what-does-it-do/

PWI/TS Personal identification —European guide for verification applications based on ID documents (ERG)

Since document verification is key to a robust digital identification, this standard is very relevant for the impulse solution. This technical specification focuses on biometric data capturing but explicitly excludes data capturing for ID document enrolment purposes. Therefore, although recommendations on usability and accessibility of the system, acquisition and biometric consideration, presentation attack detection are worth to be considered in IMPULSE, they do not fully cover the onboarding process in which additional information (not only biometric data) is captured from the ID documents for verification (e.g., name and surname in MRZ).

PWI/TS Biometric data injection attack detection

Controlling the data acquisition process in order to prevent the injection of fraudulent data is key to preserve the onboarding process. This data can only be collected by the wallet via frontal camera (developed by ALICE) that performs face detection to record a short video.

PWI/TS Personal identification —European requirements for biometric products —Part 1: General requirements and application profile definition

It was not possible to evaluate if this document applies to the IMPULSE solutions due to the early stage of the document.

PWI/TS Personal identification —European requirements for biometric products —Part 2: Interoperability tests

This work item is not in the scope of the process and ALiCE has not contemplated this during the technology development since it was not in the scope of the process.

PWI/TS Personal identification —European requirements for biometric products —Part 3: Functionality evaluation methodology

It applies to IMPULSE since a homogenic evaluation technique is fundamental to producing robust evaluations across the board. This allows different providers to compete in a standardized environment and moreover, it benefits entities that need this type of services so they can choose the best technologies available. ALiCE Biometrics technology has been evaluated and certified by the CPSTIC.

The evaluation methodologies include:

- Spain: ETD/465/2021 + LINCE + STIC 140 F11 + IT-14
- NIST FRVT evaluations (now FATE)"

PWI/TS Personal identification —European requirements for biometric products —Part 5: Face biometrics

It applies to Impulse since the onboarding method uses face biometrics and the digital identification of the final user is partly based on face-matching and liveness tests. ALiCE Biometrics technology has been evaluated and certified by the CPSTIC, which is based on this Face biometrics standard.

- Spain: ETD/465/2021 + LINCE + STIC 140 F11 + IT-14"

PWI/TR Personal identification —Usage of biometrics in breeder documents

It is not related to IMPULSE since this system does not contemplate the use case of breeder documents.

4.3.2.2 Liaison with CEN/TC 224 WG 20

CEN/TC 224 WG 20 is an *Ad Hoc Group on the European Digital Identity Wallets* with two current work items listed in Table 4. This WG with the active WI is highly relevant for IMPULSE since the project solution is one for a European Digital Identity Wallet. Information on those WI as well as to ongoing discussions were presented to the IMPULSE partners with the “Update on standardization” session.

Table 4: Active WI and recently published documents within CEN/TC 224 WG 20.

CEN/TR 17982	European Digital Identity Wallets standards Gap Analysis	Published 2023-09-27
prCEN/TS XXX	Guidelines for the onboarding of user personal identification data within European Digital Identity Wallets	Under Drafting

During the liaison period there were 5 meetings of WG 20 where Madlen Schmudde (DIN) took place in 4 as a committee observer. Within those meetings the draft of "Guidelines for the onboarding of user personal identification data within European Digital Identity Wallets" and the submitted comments were discussed as well as a liaison with the Large-Scale pilots for the EUDIW. The aim of the draft document is to provide a clear guidance for the on-boarding of a user (natural or legal person) personal identification data within a wallet. Therefore, the application and registration, the identity proofing and verification, the issuance as well as the delivery and activation are considered. Within the liaison period the opportunity came up to comment on the current draft. Therefore, the document was shared within the IMPULSE consortium. The chance to comment on this document was used by Xavier Martinez (GRAD). Those comments were submitted to the WG. If the document will be adjusted according to the comments will be decided within the WG meetings in 2024.

To gain some insight from those Large-Scale pilots a document with questions for those EUDIW pilots was developed with questions related to credentials. These questions were answered by Xavier Martinez (GRAD) on behalf of the IMPULSE project and submitted to WG 20. You can find the questions and answers below:

- **What areas of the ARF requirements on credentials does the pilots feel necessary to further specify to ensure interoperability between members of your pilot project?**
  - There are no requirements about the identification of the verifiers in the verifiable presentation exchanges, e.g., it is not clear if the EUDI Wallet MUST or SHOULD verify the identity of the service provider prior to exchanging user's information.
- **What use is made of trust services in support of the pilot applications including trust service (qualified and non-qualified) for EAA, issuance of (qualified and non-qualified) signing/seal certificates and remote signing services?**
  - The credentials issued in our use cases are signed by a QTSP via remote qualified electronic sealing.
- **What are the main issues to be addressed for the use of trust services and supporting the use of e-signatures and e-seals?**
  - Authentication mechanisms allowed between credentials (PIDs or (Q)EAAs) providers and the trust services in charge of e-signatures/e-seals.
  - The process to define what trust services are allowed to remote e-sign/e-seal PIDs or (Q)EAAs. Who will do this process and where will the allowed trust services be published (trusted lists?)
- **Can some example scenarios (use case, technology etc) for PID on-boarding, and issuance of (Q)EAA, be provided?**
  - Digital PID on-boardings or (Q)EAA issuance could be based on the presentation of a selfie and pictures of the corresponding documents (IDs, diplomas, health cards, etc.), and the validations of those images should be made with the help of AI models, as they have proven to be able to detect frauds that the human eye cannot.
- **What are the main issues to be addressed for the on-boarding of PIDs?**
  - Multiple PID onboarding processes should exist, as the range of people that will use the EUDI wallet is quite diverse. Some of these processes could be based on the presentation of identity digital certificates, the presentation of images of the physical identity documents, and physical presentation of documents as well.
- **Is there a need for interoperability with the wallet for PID onboarding in addition to procedures to achieve a high level of assurance?**

- Totally. If there ends up being a considerable number of PID onboarding processes, each EUDI Wallet provider should implement all possible onboarding processes for usability purposes. This creates a need for the PID Onboarding processes to be standardized, or otherwise the providers of these onboarding processes will implement them in their own way, which will make it harder for the entities in charge of validating if the process is allowed or not. Additionally, it will also make it harder for EUDI Wallet providers, as they would need to adapt to all possible variants.

- **What are the main issues to be addressed for interoperability of credentials?**
  - It is not clear how "Trusted Lists" will function, how verifiers will use them to identify the issuers of PIDs or (Q)EAAs, how the issuers will onboard in those "Trusted Lists", or how many different implementations of lists will co-exist.
- **Are there further details on the credential (PID and (Q)EAA) formats used by your pilot that you can share with CEN and ETSI?**
  - JWT format. The scheme used is the EBSI Verifiable ID for natural persons: https://ec.europa.eu/digital-building-blocks/wikis/display/EBSIDOC/Verifiable+ID+-+Natural+Person
- **Are there any issues that you feel would benefit from wider discussion with ETSI and CEN?**
  - No answer was submitted to that question

4.3.3 Interaction with UNE CTN 71/SC 307

In deliverable D3.4 “Standards and related impacts and implications”, one Spanish standard was highlighted as highly relevant for the project. UNE 71307-1 - *Digital Enabling Technologies - Distributed Identities Management Model on Blockchain and other Distributed Ledger Technologies. Part 1: Reference Framework* defines a reference framework for the management of decentralized identities oriented to people, physical and legal, which includes the description of an approach based on life cycles and the relationship of the main actors that participate in them, as well as the interrelationships among them. The document directly tackles the management of digital identities in a decentralised manner. Therefore, this standard is used in IMPULSE to follow the best practices for decentralised identity management. The responsible Spanish standardization committee that developed this standard is CTN 71/SC 307 Blockchain and distributed ledger technologies. GRADIANT contributed to this standardization committee mainly by providing input related to security and privacy aspects of the use of DLTs/blockchain networks in the context of digital identity. UNE 71307-1 furthermore was under discussion for uptake on European level in CEN-CLC/JTC 19 (see 4.3.1).

The first contact to the Spanish standardization committee CTN 71/SC307 was already established from DIN in May 2021. The first web meeting took place on 2 June 2021 with the IMPULSE project coordinator from GRAD and the chairperson of this committee, resulting that the project was invited to participate in the next committee meeting. Previously, a preparatory meeting took place on 23 September 2021 in which besides the chairperson also the convenor of the standardization committee Cesar Perez Chirinos (BDE) took part. On 15 October 2021, René Lindner (DIN) and Alicia Jiménez (GRAD) presented the IMPULSE project in the CTN 71/SC307. The standardization committee saw great potentials for collaboration between the project and committee, which resulted in further exchanges and the fact that René Lindner (DIN) became an observing member and Jaime Loureiro and Alicia Jiménez (GRAD) participating members in the committee. Through this partnership, IMPULSE could provide direct feedback to the activities of the standardization committees and propose new topics for standardization deriving from the project.

In the upcoming meetings, mainly Jaime Loureiro (GRAD) participated in meetings in October 2021, April 2022, May and November 2023. The main discussion points were the uplift of the UNE 71307-1 to European level and the support to the preparation of the other parts of the UNE 71307 standards series.

Furthermore, the chairperson of the CTN 71/SC 307 participated in the standardization potential workshop of IMPULSE on 15 July 2022 to present the UNE activities related to Blockchain and DLTs.

4.3.4 Further national activities and outlook

Besides the interaction with the relevant Spanish standardization committee, the IMPULSE project was also presented via DIN in March 2021 to the German standardization committees NA 043-02-04 AA *Blockchain and electronic distributed ledger technologies* and to the business development team for artificial intelligence at DIN. Among others, it was raised awareness on discussing the national view for the uptake of UNE 71307-1 to European level. From the exchanges with the UNE CTN 71/307 and the German committee NA 043-02-04 AA, the "Joint Declaration on cooperation and exchange of best practices in the field of self-sovereign identity between the Federal Republic of Germany and the Kingdom of Spain"[12] was highlighted. Thus, there are direct interactions between the Spanish and German actors on the eID topic. As an interaction is already taking place, there was no further need to deepen the interaction from the IMPULSE project to the German standardization committees. However, status updates were given and information on the final project results will be provided to the relevant German standardization committees beyond the project.

In addition, the participation of IMPULSE partners during and hopefully beyond the project ensured and will ensure the uptake of the project results in future standardization activities.

For the final event of IMPULSE on 19 January 2024, the results of the standardization activities conducted were summarized in a standardization flyer to promote the projects' standardization activities to the public (see Annex A.5). Furthermore, a scientific paper entitled "Fostering dissemination and exploitation of project results via liaisons with standardization committees – the case of the IMPULSE project" was prepared for the event and presented by René Lindner (DIN), to which also Madlen Schmudde (DIN) and Jaime Loureiro (GRAD) also contributed (see Annex A.6).

[12] https://www.bundesregierung.de/resource/blob/975226/1947314/4dc5ac1821962d969304886d9c09b768/2021-07-29-joint-declaration-on-cooperation-spain-germany-data.pdf?download=1

5 IMPULSE and the application of standards

Within deliverable D3.4 standards whose topics are strongly related to IMPULSE were highlighted as highly relevant standards. These nine standards are listed in Table 5. Within a final standardization workshop on 24th November 2023 it was analyzed if these standards were actually used. In the end, five out of those nine highly relevant standards were applied to develop the IMPULSE solution.

Table 5: Standards rated as highly relevant by the WP's.

Document No.	Title	Applied within IMPULSE
CEN/TS 16921:2016	Personal identification - Borders and law enforcement application profiles for mobile biometric identification systems	Not applied
DIN SPEC 4997:2020	Privacy by Blockchain Design: A standardized model for processing personal data using blockchain technology	Not applied
ETSI GR SAI 001 V 1.1.1:2022	Securing Artificial Intelligence (SAI) - AI Threat Ontology	Not applied
ETSI GR SAI 002 V 1.1.1:2021	Securing Artificial Intelligence (SAI) - Data Supply Chain Security	Applied
ETSI TS 119 182-1:2018	Electronic Signatures and Infrastructures (ESI) - JAdES digital signatures - Part 1: Building blocks and JAdES baseline signatures	Applied
ISO/IEC 20889	Privacy enhancing data de-identification terminology and classification of techniques	Not applied
ISO/IEC 27001:2022	Information technology - Security techniques - Information security management systems - Requirements	Applied
ISO/IEC 30107 series:2022	Information technology — Biometric presentation attack detection	Applied
UNE 71307-1:2020	Digital Enabling Technologies - Distributed Identities Management Model on Blockchain and other Distributed Ledger Technologies. Part 1: Reference Framework	Applied

For the future deployment of the IMPULSE solution, the compliance with the latest and future standards is highly important. Those standards are listed in Table 6.

Table 6: New standards and standards under development.

Document No.	Title	Relevance for IMPULSE
ISO/IEC 23220-1:2023	Cards and security devices for personal identification — Building blocks for identity management via mobile devices — Part 1: Generic system architectures of mobile eID systems	Gives a system architecture
ISO/IEC CD TS 23220-2	Cards and security devices for personal identification — Building blocks for identity management via mobile devices — Part 2: Data objects and encoding rules for generic eID systems	Gives a data model
ISO/IEC CD TS 23220-3	Cards and security devices for personal identification — Building blocks for identity management via mobile devices — Part 3: Protocols and services for issuing phase	Gives protocols for credential issuance
ISO/IEC CD TS 23220-4	Cards and security devices for personal identification — Building blocks for identity management via mobile devices — Part 4: Protocols and services for operational phase	Not really relevant

ISO/IEC CD TS 23220-5	Cards and security devices for personal identification — Building blocks for identity management via mobile devices — Part 5: Trust models and confidence level assessment	Not really relevant
ISO/IEC CD TS 23220-6	Cards and security devices for personal identification — Building blocks for identity management via mobile devices — Part 6: Mechanism for use of certification on trustworthiness of secure area	Gives a trust framework for secure hardware
ISO 22385:2023	Security and resilience — Authenticity, integrity and trust for products and documents — Guidelines to establish a framework for trust and interoperability	Not really relevant
ISO 22376:2023	Security and resilience — Authenticity, integrity and trust for products and documents — Specification and usage of visible digital seal (VDS) data format for authentication, verification and acquisition of data carried by a document or object	Not really relevant
ETSI GR PDL 019 V 1.1.1:2023	PDL Services for Decentralized Identity and Trust Management	Not really relevant
ISO/TR 23249	Blockchain and distributed ledger technologies - Overview of existing DLT systems for identity management	Not really relevant
ISO/TR 23644:2023	Blockchain and distributed ledger technologies (DLTs) - Overview of trust anchors for DLT-based identity management	Not really relevant
ISO/IEC 27553-1:2022	Information security, cybersecurity and privacy protection - Security and privacy requirements for authentication using biometrics on mobile devices - Part 1: Local modes	Not really relevant
ISO/IEC WD 27553-2.2	Information security, cybersecurity and privacy protection — Security and privacy requirements for authentication using biometrics on mobile devices — Part 2: Remote modes	Not really relevant

6 IMPULSE, standards and their alignment with regulations

6.1 IMPULSE and the European Digital Identity Wallets

The European Commission will provide a prototype of a EU Digital Identity Wallet (EUDIW) as set out in the proposed European Digital Identity Regulation. The proposal aims to enable European citizens and business to share identity data in a secure and convenient way. The prototype wallet, procured under the Digital Europe Programme:

- serves to trial and inform the specifications developed by Member States in close collaboration with the Commission, as the common EU Toolbox to implement the EU Digital Identity Wallet;
- will be tested in a number of Large Scale Pilots that cover different sectors, such as healthcare, financial services, education and transport;
- will be made available for re-use by Member States, Pilot Projects and other contributors as open source.

An initial version of the reference implementation is to be made available on Github together with the first complete version of the common EU Toolbox to implement the EU Digital Identity Wallet in September 2023.[13]

In the context of the EUDIW the CEN/TR 17982:2023 – *European Digital Identity Wallets standards Gap Analysis* could be an interesting document. During the liaison with CEN/TC 224, WG 20 published this technical report. This document identifies articles and clauses in the proposal of regulation defining requirements that are applicable to the wallet. Within this document for each listed requirement the available standards and standards under development that could be used or considered as well as their scope of application are presented. Further, also missing standards and the requirement of standardization activities are mentioned. This technical report started before the Architecture Reference Framework (ARF) release and has the purpose of mapping the legal text of the eIDAS regulation[14] to available standards and identify possible gaps. It has been published in September 2023 and was put in relation with the IMPULSE activities.

The following standards and similarities have both, IMPULSE and eID Wallet, in common:

- Holder authentication: both use with OpenID4VCI[15] the same Verifiable Credential Issuance Protocol and with OpenID4VP[16] and + SIOPv2[17] the same Attestation Exchange Protocol.
- Format of the electronic attestation of attribute (Article: 3(44)): both use with W3C VC[18] the same Verifiable Credential Model.
- Others: Both support qualified electronic seals (QEEs), and both solutions support Remote Cross Device flow and Remote same-device flow for the onboarding and authentication processes.

6.2 Standards and eIDAS regulation

The main focus with regard to the relation of IMPULSE, standards and their alignment with regulations should be eIDAS - the regulation on electronic identification and trust services for electronic transactions in the internal market. The eIDAS Regulation helps business, citizens and public authorities carry out secure and seamless electronic interactions. The eIDAS Regulation:

- ensures that people and businesses can use their own national electronic identification schemes (eIDs) to access public services available online in other EU countries.
- creates a European internal market for trust services by ensuring that they will work across borders and have the same legal status as their traditional paper-based equivalents.

[13] https://digital-strategy.ec.europa.eu/en/policies/eudi-wallet-implementation
[14] Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL amending Regulation (EU) No 910/2014 as regards establishing a framework for a European Digital Identity - COM(2021) 281 final (https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%)
[15] https://openid.net/specs/openid-4-verifiable-credentialissuance-1_0.html
[16] https://openid.net/specs/openid-4-verifiable-presentations-1_0.html
[17] https://openid.github.io/SIOPv2/openid-connect-self-issued-v2-wg-draft.html
[18] https://www.w3.org/TR/vc-data-model/

Only by providing certainty on the legal validity of these services will businesses and citizens use digital interactions naturally.[19]

Within CEN/TC 224 in collaboration with ETSI TC ESI the support of eIDAS 2 with standards is in the focus. The work item on "*Guidelines for the onboarding of user personal identification data within European Digital Identity Wallets*" from CEN/TC 224 WG 20 shall describe by tackling the regulatory requirements how to achieve on-boarding as well as the requirements to meet the level of assurance "high". The format of Person Identification Data (PID) as well as the metadata supporting the protection of PID disclosure will likely also be one aspect which will be integrated in this specification.

CEN/TC 224/WG18 published a number of standards supporting the use of biometrics. Biometrics are a possible means of authentication of the wallet holder. At the moment CEN/TC 224 WG 18 has four active work items which should cover the European requirements for biometric products (see subclause 4.3.2.1). Another work item in this regard to fingerprints is in the planning. Further, biometric data injection attack detection like the detection of deepfake is covered in another work item.

A working group which was not in the focus of the liaison with CEN/TC 224 is WG17 on *Protection profiles in the context of SSCD*. This WG provided a number of standards in the context of the EU Signature Directive 1999/93/EC focusing on security requirements for qualified signature creation devices (QSCD), and trustworthy systems and products for qualified trust services.

Within ETSI the requirements of eIDAS are in the focus for trust services and information security / cyber security practices. ETSI published standards which provide requirements for auditing trust services. ETSI has carried out an analysis of selective disclosure and zero-knowledge proofs applied to Electronic Attestation of Attributes (ETSI TR 119 476) which provides a background to the selection of choices in applying SD-JWT (JSON syntax) and MobileSecurityObject (CBOR syntax) to the EUDIW. Within current work items ETSI also covers standardization for advanced electronic signature formats. Within the repertoire of ETSI there are standards which provide requirements for auditing trust services (ETSI EN 319 403-1) and general policy requirements for trust service providers (ETSI EN 319 401) which are equally applicable to trust service providers providing electronic ledgers. Further specifications for permissioned distributed ledgers also exist.

Due to the specification of requirements for qualified electronic registered delivery services in the eIDAS regulation the European Commission has mandated to CEN/TC 331 – *Postal services* to update the appropriate Technical Specifications. It has also mandated that CEN shall coordinate its work on these standardization deliverables with ETSI where possible.

ETSI and CEN have recognized the overlap between requirements for identity proofing for onboarding of personal identification data (PID) within wallets, and identity proofing for trust services. Hence there is agreement to include generic aspects in ETSI TS 119 461 which can be referenced in the relevant CEN standardization to define a profile for onboarding PIDs within wallets.

ETSI TC ESI and CEN/TC 224 have recognized the significant overlap in standardization activities supporting eIDAS 2. In order to avoid conflicts technical experts involved in the above activities are working together to ensure the respective standardization fits together in a coherent set of standards.

Form the IMPULSE point of view, there are several International Standards that are of importance for the IMPULSE project due to their entertainment with eIDAS regulation and GDPR:

- **ISO/IEC 29115**: This standard provides a framework for authentication assurance, sorting the matter in four Level of Assurance (LoA). This is a really important as it gives depth and details to the LoA listed in the eIDAS. It has also been recently endorsed by the ENISA in a report. As such, it would be only wise to extract knowledge from it for the sake of gaining some insights for the future of IMPULSE after the end of the project.
- **ISO/IEC 27001**: This is one of the most widespread and well-grounded standards for what concerns information security. Its relevance lies in the fact that it provides a framework for the security of processing of personal data, as enshrined in Art. 32 of the GDPR. Therefore, since IMPULSE manages biometric data it would be a good step towards personal data protection to include this standard into the legal analysis.

[19] https://digital-strategy.ec.europa.eu/en/policies/eidas-regulation

7 Conclusions

This deliverable gives an overview on the activities carried out within Task 7.6 – *Initiation of standardization activities*. The aim of this task is to integrate project results into standardization. One option in doing so is to develop a workshop agreement (i.e. CWA on European level) out of the project results with the support of the projects partners. The other option is to include project results in standards under development. This can be done via a liaison with the corresponding technical standardization committee in whose responsibility those active work items are. Since the first option is most probably the one which has the greatest impact regarding time and resources within a project like IMPULSE, the analysis for standardization topics out of the IMPULSE project was initiated.

To gather potential topics for standardization from the IMPULSE project a two-part workshop was conducted in June and July 2022. Within this workshop topics for potential standards were identified, combined and further defined. In the end there were two topics left for developing a CWA: *Application of AI and Blockchain in Used Cases - Identity Management in Public Services* (subclause 3.3.2) and *Consent Management for eID Solutions* (subclause 3.3.3). Due to a number of current activities within the different technical committees especially on European level, it was decided against the development of an own standardization document out of IMPULSE within the consortium. Instead, the collaboration with relevant technical standardization committees was targeted.

Therefore, the IMPULSE was presented to CEN-CLC/JTC 19 (subclause 4.3.1) and CEN/TC 224 (subclause 4.3.2) in November 2022 to examine the possibilities and the interest for an official liaison offering the opportunity to comment at an early stage on draft standards and thus integrating project results. A liaison with CEN/TC 224 was achieved whereas a special focus was laid on WG18 – *Biometrics* and WG20 - *Ad Hoc Group on the European Digital Identity Wallets*. The liaison with those WG's mainly offered a wide overview and deep insight into the active work items. The opportunity to include project results of IMPULSE into the draft standards, which were open for comments, was used. Nevertheless, the interaction with CEN/TC 224 made it possible to compare the IMPULSE solution with the standards at the drafting stage, which provided valuable insights. At national level (Spain) the interaction of IMPULSE with UNE CTN 71/SC 307 for the development of the standard UNE 71307-1 - *Digital Enabling Technologies - Distributed Identities Management Model on Blockchain and other Distributed Ledger Technologies. Part 1: Reference Framework* was continued. Unfortunately, it was decided for the time being to not develop this standard further on European level, which would have been in the scope of CEN-CLC/JTC 19.

The alignment of the IMPULSE solution with current and future standards was regarded (clause 5). On the one hand the related active work items from CEN/TC 224 were analysed in that regard. On the other hand, already highlighted standards form deliverable D3.4 were considered again in this deliverable with regard to their definite usage for IMPULSE. From those nine highlighted standards five were actually used. In view of the future deployment a list with recently published standards and standards under development with relation to IMPULSE was provided. Within clause 6, standards and their alignment with regulations in the broader context of IMPULSE were regarded. This provides also a basis for the future deployment of the IMPULSE solution.

Annex A

A.1 Material from the standardization potential workshop

A.1.1 Google form for preparing the standardization potential workshop

Standardization Potential Workshop - Preparation

Dear IMPULSE-Partners,

standardization can offer a great opportunity in R&I projects. During the duration of IMPULSE we already shared a lot of information with you regarding standardization. In our Task 3.4 “Analysis of existing relevant standards, and related impacts and implications” we provide an overview of the standardization landscape.

This is a short survey in preparation for our standardization potential workshop in WP7 which consists of 2 parts. In the rst part, which will take place virtually, we will collect ideas together with you where you think standardization could ll a gap. In the second part, held in person, we will discuss the standardization ideas in depth and decide which ones are worth pursuing.

Please answer this survey which will help us to prepare the workshop. It will only take 5 min of your time.

Should you have any questions, doubts, or comments that do not t in this questionnaire, please contact me (madlen.schmudde@din.de).

Thank you for your time!

Best wishes, Madlen

* required question

Personal information

This information will help us to contact you and provide further information.

1. Name *

2. Partner Affiliation *

3. In which workpackages in IMPULSE are you mainly active?

- o WP1
- o WP2
- o WP3
- o WP4
- o WP5
- o WP6
- o WP7
- o WP8

Standardization

Standardization is a key strategic tool to agree on terminologies, methodologies, requirements, quality criteria, etc. in a specific eld to make a product, process, or service t for its purpose. Thereby standardization can drive innovations e.g., as it can be agreed on product requirements including safety, health, compatibility, etc. and guidance on how to archive them can be provided.

A standard is a document, established by a consensus of all interested stakeholders. It should be based on the consolidated results of science, technology and experience, with the aim to promote the optimum community benefits. A standard is developed by experts within Technical committees (TC) and approved by a recognized body i.e., a standardization body like DIN.

4. Have you ever been/are you currently involved in the development of a standard?

- o Yes
- o No

If yes, please explain very shortly.

5. Are you interested in a specific technical committee?

- o Yes
- o No

If yes, which one(s)?

6. Is there anything you would like to standardize? Or are you aware of an area in the context of IMPULSE where standards are still missing?

- o Yes
- o No

If yes, please let us know.

Results of IMPULSE

7. What is the most relevant result/technology in Impulse for you at the moment or even in the future?

8. Does there already exist a standard for this result/technology?

- o Yes
- o No

If yes, which one?

If no, would there be a standard useful? Please explain.

Thank you very much for your contribution!

A.1.2 Presentation standardization potential workshop – part 1

Impulse

Identity Management in PUbLic SErvices

Standardization Potential Workshop – Part 1

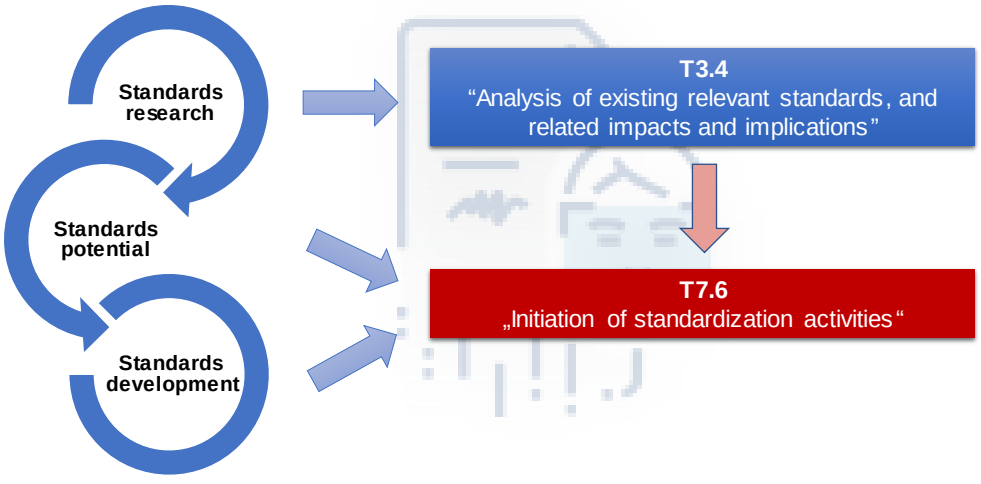
DIN – Madlen Schmudde and René Lindner

Virtual, 16th June 2022

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 10100445

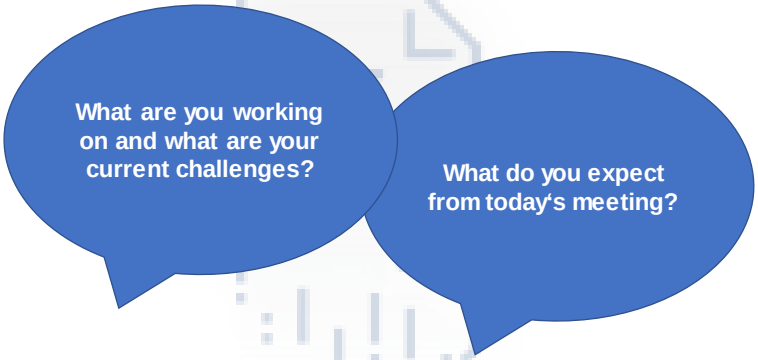
Impulse

Standardization in IMPULSE



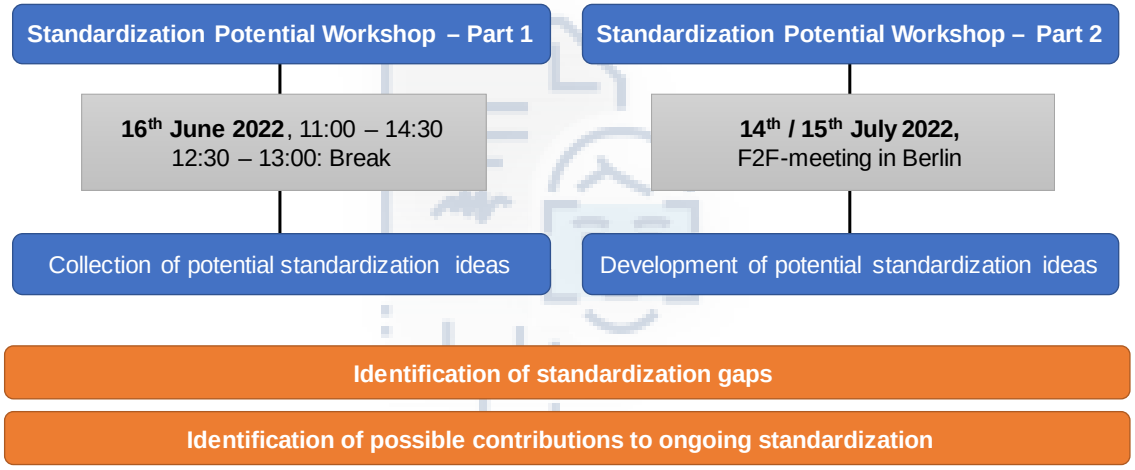
2

Round of Introduction



3

Structure of this Workshop



4

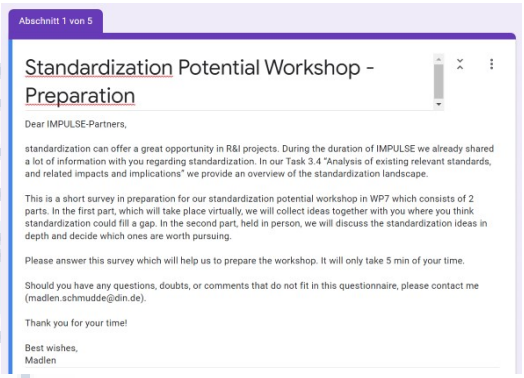
Survey

- Goal:

→overview of interest/experience in standardization in general

→ interest in specific activities regarding standardization

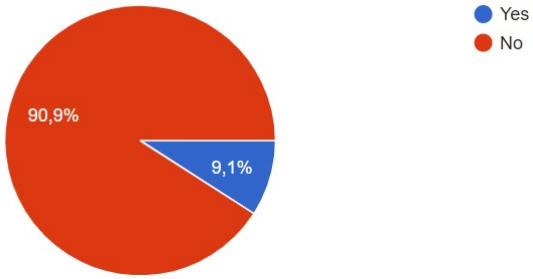
- 11 participants from 10 organizations
- Answers from 5 organizations are missing



5

Survey

Have you ever been/are you currently involved in the development of a standard ?



Today we will do the first step to involve you in standardization!

6

Main facts about standardization

- **Standardization**: activity of establishing, with regards to actual or potential problems, provisions for common and repeatable use, aimed at the achievement of the optimum degree of order in a given context.

  (Source: EN 45020:2006 Standardization and related activities - General vocabulary (ISO/IEC Guide 2:2004))

- **Standard**: document, established by **consensus** and approved by a recognized body that provides, for common and repeated use, rules, guidelines or characteristics for activities or their results, aimed at the achievement of the optimum degree of order in a given context

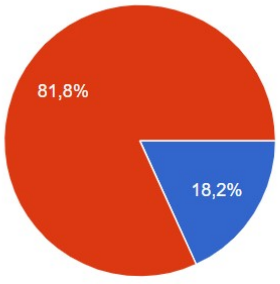
  (Source: EN 45020:2006 Standardization and related activities - General vocabulary (ISO/IEC Guide 2:2004))

- developed by **Technical Commitees** on national, European or international level
- **Technical Commitees**: organize input of **interested stakeholders** to the standardization activities

7

Survey

Are you interested in a specific technical committee?



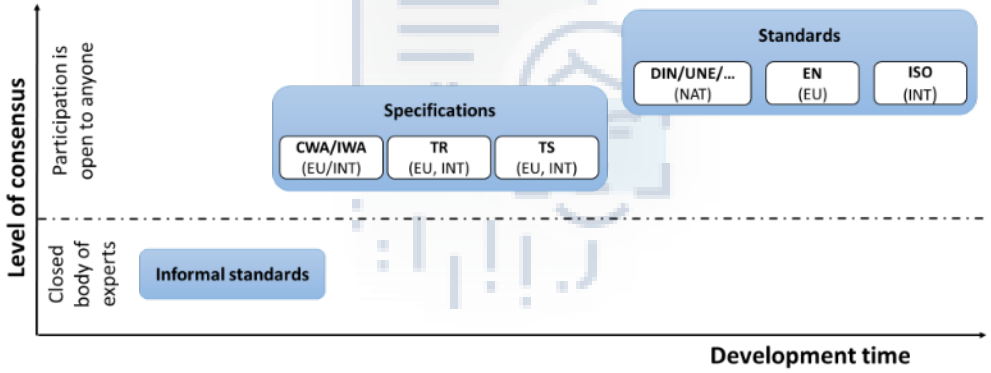
- Artificial Intelligence
- ETSI ESI

Overview of technical committees in D3.4 (draft already on the sharepoint)

8

Main facts about standardization

Types of standardization documents



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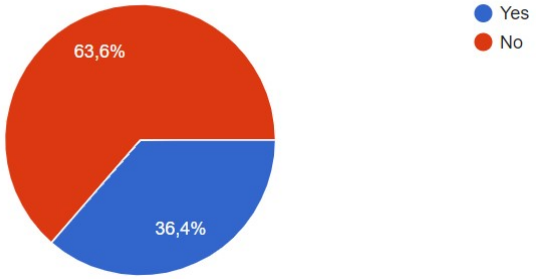
Survey

Is there anything you would like to standardize? Or are you aware of an area in the context of IMPULSE where standards are still missing?



10

Survey

Is there anything you would like to standardize? Or are you aware of an area in the context of IMPULSE where standards are still missing?

standardisation on the e-wallet components (interfaces, etc) are already ongoing. we recommend that impulse **partners contribute individually** on these activities where appropriate, without necessarily having impulse project directly proposing a new standard.

Usability and privacy/data protection

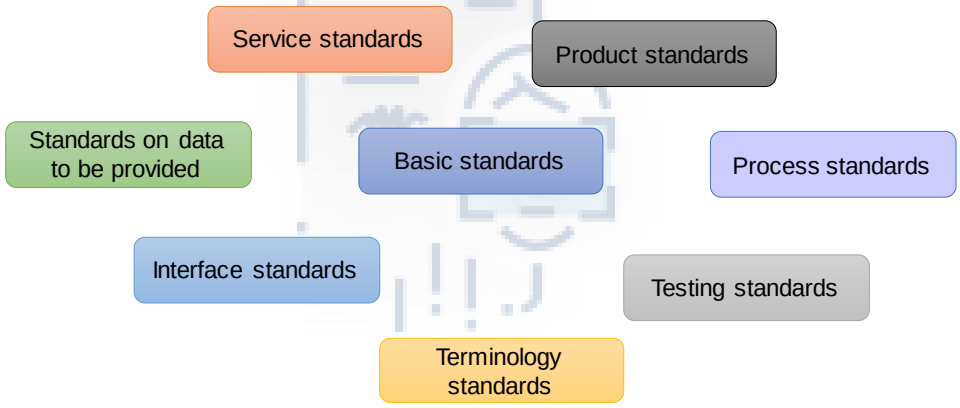
IMPULSE standards for the envisioned **wallet function and to avoid fragmentation** . By that I mean the same basic information is collected from the users repeatedly and used for authentication purposes in separate databases of institutions such as government institutions, banks, police etc

Maybe the standards related to **data privacy and protection of personal data.**

11

Main facts about standardization

Types of standards



12

Impulse

Survey

What is the most relevant result/technology in Impulse for you at the moment or even in the future?

- Use of blockchain concept
- Alternative solution to the digital identification of citizens
- Blockchain Face recognition
- ID document verification
- Consent management
- Development of electronic identity
- validation of usability of the wallet in the context of public services
- Blockchainand AI
- comparison of the case studies in terms of usability and applicability
- application of AI for biometric identification and document verification
- SSI and certified use of facial metrics for 'official' identification

13

Impulse

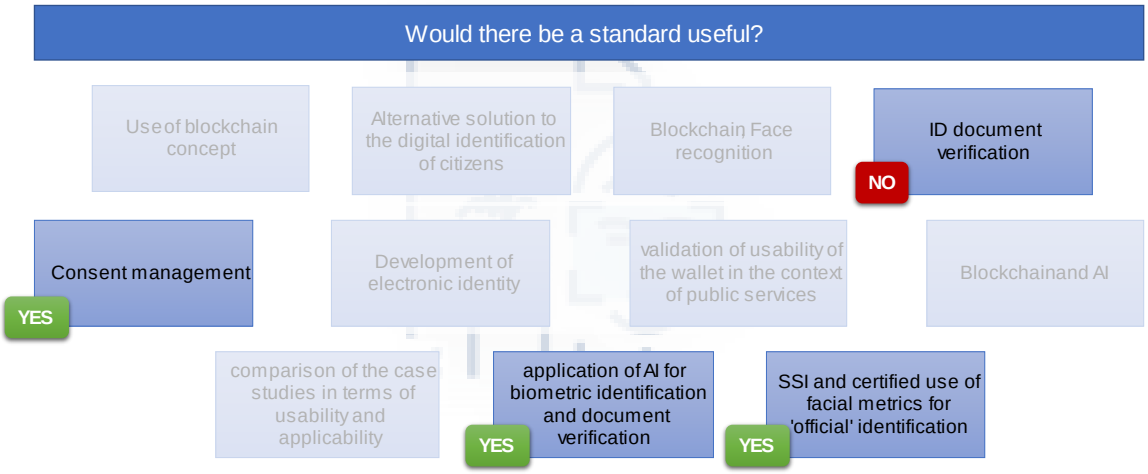
Survey

Does there already exist a standard for this result/technology?

- Use of blockchain concept — YES — https://blockchain.ieee.org/standards/
- Alternative solution to the digital identification of citizens — YES — CAdES, PAdES, XAdES
- Blockchain Face recognition — YES — several
- ID document verification — NO
- Consent management — NO
- Development of electronic identity — YES — ISO/IEC DI 23220, ...
- validation of usability of the wallet in the context of public services — YES — several
- Blockchainand AI — YES — Blockchaindocs
- comparison of the case studies in terms of usability and applicability
- application of AI for biometric identification and document verification — NO
- SSI and certified use of facial metrics for 'official' identification — NO

14

Survey



15

Further Work on Conceptboard

- **Let's move to the concept board:**
- https://app.conceptboard.com/board/fb6x -rexr-fxer-brtf-mo4g

16

Identity Management in PUbLic SErvices

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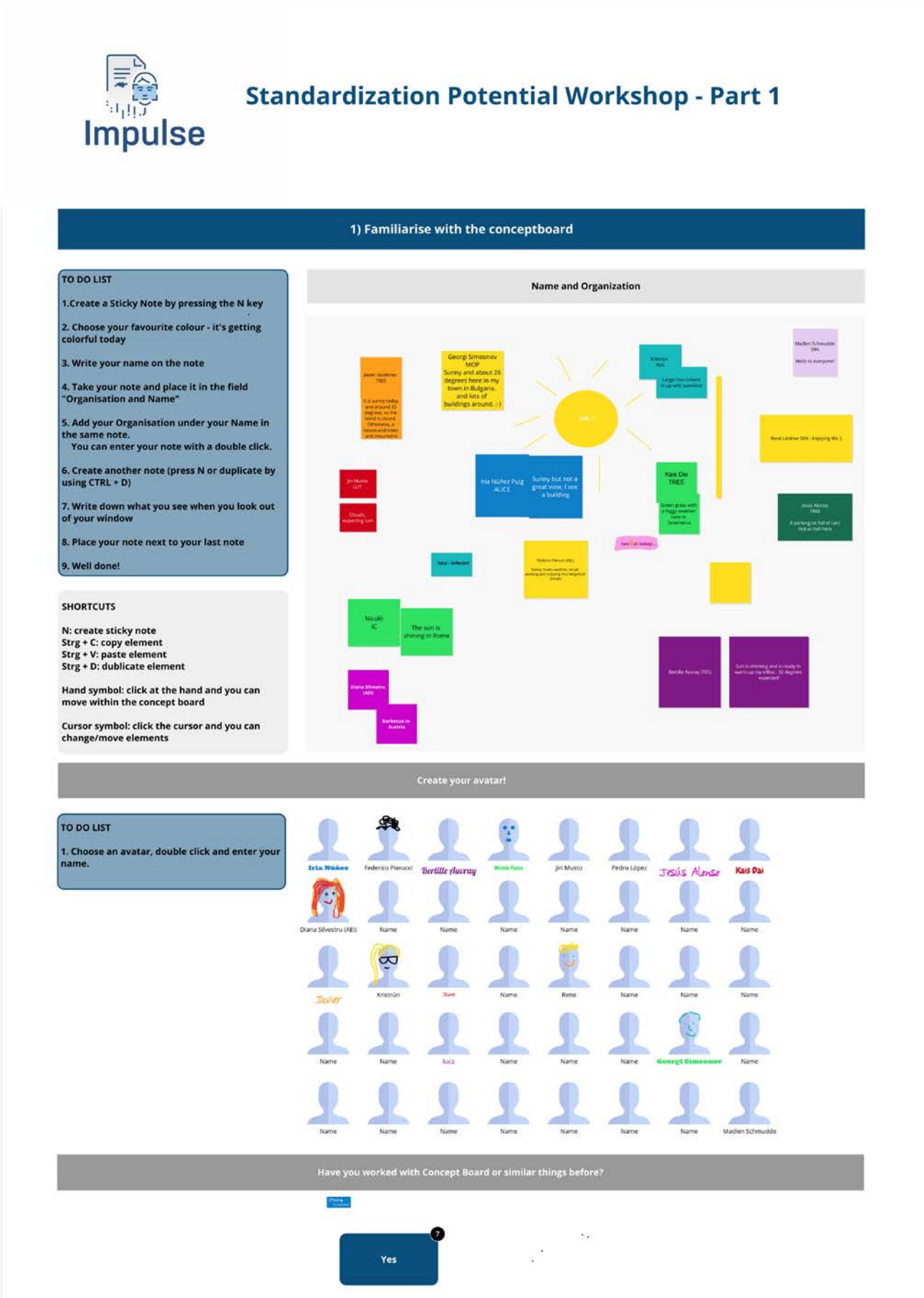
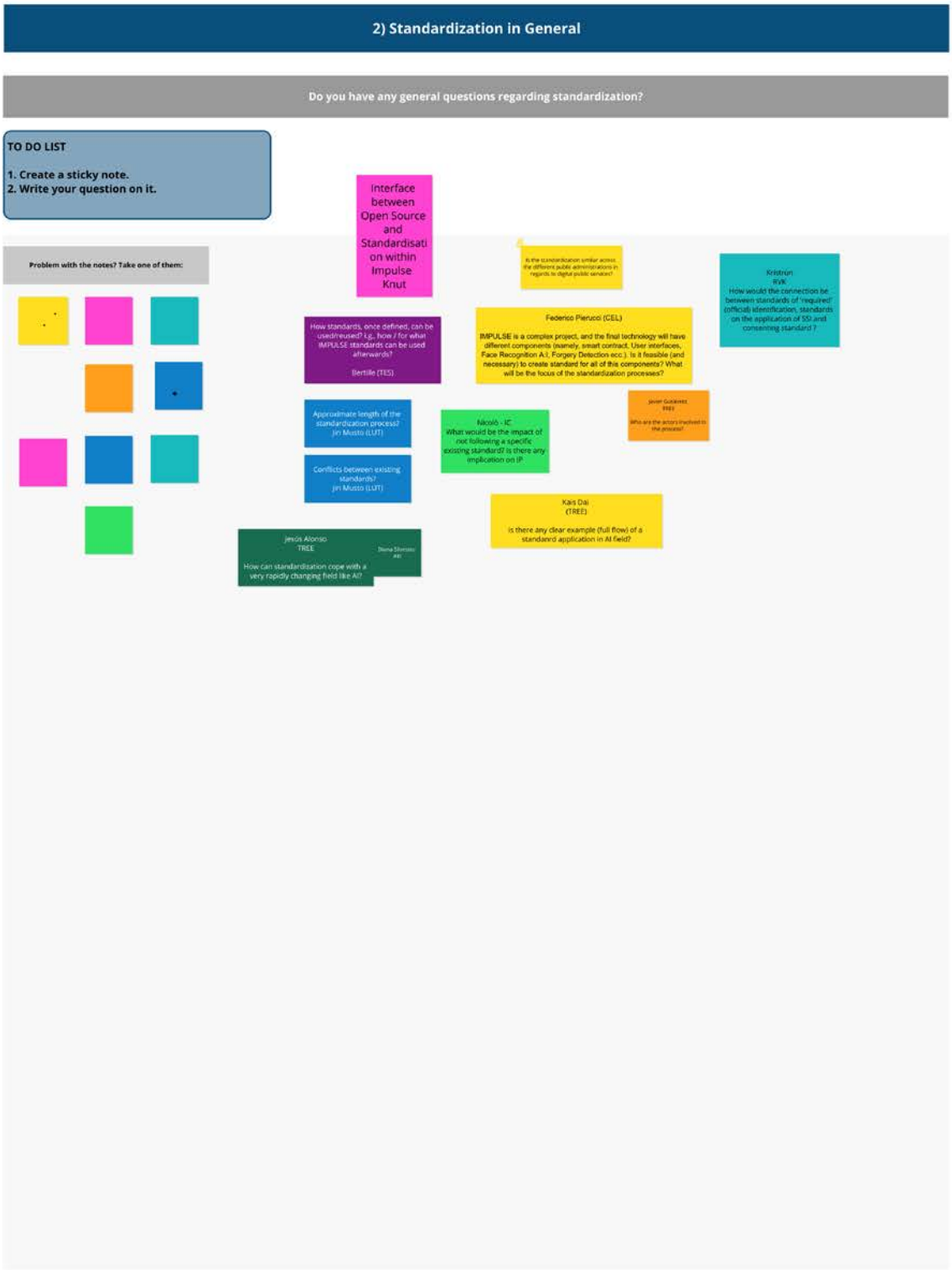
This project has received funding from the European Union's Horizon 2020
research and innovation programme under grant agreement No 10100445

A.1.3 Conceptboard standardization potential workshop – part 1



Impulse

Standardization Potential Workshop - Part 1



A.1.4 Google form survey on IMPULSE solutions

Survey on IMPULSE Solutions

Dear IMPULSE-Partners,

during the rst part of our Standardization Potential Workshop we already identi ed some interesting topics where standardization could help disseminate our IMPULSE solutions. The second part of our workshop is mainly to discuss the standardization ideas in depth and decide which ones are worth pursuing. This survey on IMPULSE solutions will help us to prepare the second part of our workshop. It will only take 5-10 min of your time to answer this survey.

If you have any questions, doubts, or comments that do not t in this questionnaire, please contact me (madlen.schmudde@din.de).

Thank you for your time!

Best wishes, Madlen

* required question

Personal Information

1. Name *

2. Partner Affiliation *

Topic 1: Data Privacy and Data Protection

This topic includes consent management in general, icons which simplify the consent management process for the user but also the topic of smart contracts.

The IMPULSE project adopts a SSI approach, meaning that the user is the sole detainer of his/her personal data and of the consents he/she gives to use and/or detain them. The problem is that from one hand understanding the consents he/she is giving, from the other hand managing the consents is not easy at all. To overcome this difficulty CEL has developed a set of icons that will help the user to visually and so immediately identify the main points of the data consent form through a contract between the subject and the service provider. Furthermore, these icons will be integrated into an app that the user will have the possibility to use to manage his/her consents: see what consents she/he has give and to what organizations, revoque fully or partially the consents, etc.

Is this a topic of interest for you? *

- o Yes
- o No
- o Maybe

What are for you the challenges in this topic with regard to IMPULSE?

Topic 2: Application of AI

This topic covers the application of AI in the context of face recognition and / or document veri cation. However, you can also suggest other topics related to the application of AI.

Is this a topic of interest for you? *

- o Yes
- o No
- o Maybe

What are for you the challenges in this topic with regard to IMPULSE?

Topic 3: e-Wallet

The user wallet is a module within the mobile (end user) app that stores and provides an interface to make use of the cryptographic material needed to interact in the SSI environment (DIDs, key pairs, VCs, VPs).

The enterprise wallet is a module within the Enterprise Service that stores and provides an interface to make use of the cryptographic material needed to interact in the SSI environment (DIDs, key pairs, VCs, VPs).

This topic covers the envisioned wallet functions and ways to avoid fragmentation.

Is this a topic of interest for you? *

- o Yes
- o No
- o Maybe

What are for you the challenges in this topic with regard to IMPULSE?

Topic 4: Roadmapping

This topic covers the process of writing a roadmap from the preparation phase to the writing phase with regard to a high level of quality.

Is this a topic of interest for you? *

- o Yes
- o No

- Maybe

What are for you the challenges in this topic with regard to IMPULSE?

Topic 5: Assessment Tool

This assessment tool is for analysing if a solution like IMPULSE would be suitable for different PA services.

Is this a topic of interest for you? *

- Yes
- No
- Maybe

What are for you the challenges in this topic with regard to IMPULSE?

Topic 6: ID Verification Service

A service to assess that an ID document is genuine. Digital image processing techniques are implemented by using state-of-the-art optical character recognition (OCR) methodology utilising convolutional neural networks to read the document text, the Lvenshtein distance to contrast it to user-provided information, a features extraction technique, a clustering method to detect copy-move forgery and one-class classi cation models to detect character morphology forgery.

Is this a topic of interest for you? *

- Yes
- No
- Maybe

What are for you the challenges in this topic with regard to IMPULSE?

Topic 7: Remote qseal Service for Verifiable Credential

The service will be used for remote digital sealing of VCs, in the context of a SelfSovereign Identity issuing service implemented in IMPULSE based on EBSI-ESSIF infrastructure.

Sealing VCs with an eIDAS compliant service will enhance the trustworthyness of issued credentials, responding to the requirements of the IMPULSE project where the technology is applied to public services.

Is this a topic of interest for you? *

- o Yes
- o No
- o Maybe

What are for you the challenges in this topic with regard to IMPULSE?

Topic 8: Decentralized Identity Management Solution compliant with the European Self Sovereign Identity Framework (EBSI/ESSIF) focused on Public Administrations

A modular and ESSIF-compliant decentralized identity management solution for thepurposes of users registration and authentication with online services. The solution consists of two main components:

(1) an User Mobile Application that provides European citizens a digital wallet to securely store and hold their identity attributes as de ned in ESSIFv2 and

(2) an Enterprise Service that provides legal entities or relying parties (at the moment only Public Administrations) the capability of acting as a Trusted Issuer and/or Veri er of users' identity attributes following the ESSIFv2 speci cations.

Both components can be easily integrated with biometric and document veri cation modules from different third parties to ensure both registration and authentication processes.

Is this a topic of interest for you? *

- o Yes
- o No
- o Maybe

What are for you the challenges in this topic with regard to IMPULSE?

Topic 9: Enrolment and Authentification to Access online Public Services

By combining three existing and disruptive technologies, namely Arti cial Intelligence (AI), Blockchain (BC) and Smart Contracts (SC), IMPULSE aims to transform the two critical processes required to access the online public services: enrolement and authentication. These are the same two basic work ow or scenarios considered for the design and implementation of the IMPULSE eID-solution.

Is this a topic of interest for you? *

- o Yes
- o No
- o Maybe

What are for you the challenges in this topic with regard to IMPULSE?

Topic 10: Guideline on how to handle Needs and Concerns of Stakeholders

Each stakeholder group has a unique set of needs and concerns, which shall be addressed by the IMPULSE eID solution. The needs and concerns are different than simply listing anything that the stakeholder "wants": It should refer to the goals that the stakeholder wants to achieve (the jobs-to-be-done) and should be technically, legally, and ethically feasible to achieve those intended goals. Unlike software requirements, the needs and concerns belong to the problem domain.

Is this a topic of interest for you? *

- o Yes
- o No
- o Maybe

What are for you the challenges in this topic with regard to IMPULSE?

Topic 11: SSI at the Core of a User-Centric eID Approach

Unlike other centralized eID systems like the ones based on user/password or federated identities (i.e., Facebook, Google, LinkedIn...), IMPULSE proposes a secure and privacy preserving alternative for existing eID management systems, being the self-sovereign identity (SSI) concept at the core of the user-centric IMPULSE eID approach.

Is this a topic of interest for you? *

- o Yes
- o No
- o Maybe

What are for you the challenges in this topic with regard to IMPULSE?

A.1.5 Agenda standardization potential workshop – part 2

Meeting Agenda

Date	15/07/2022
Location	DIN e. V., Burggrafenstraße 6, 10787 Berlin / virtual

AGENDA

Friday, 15th July 2022

Time	Description
9:30 - 9:45 (CEST)	Welcome
9:45 - 10:15 (CEST)	Standardization activities regarding AI and Blockchain -Presentation DIN -Presentation UNE
10:15 - 13:00 (CEST)	Standardization Potential Workshop – Part 2 -Introduction -Interactive session
13:00 – 14:00 (CEST)	Lunch Break
14:00 – 16:00 (CEST)	Real Corp 2022 – Paper preparation

A.1.6 Presentation standardization potential workshop – part 2

Impulse

Identity Management in PUbLic SErvices

Standardization Potential Workshop – Part 2

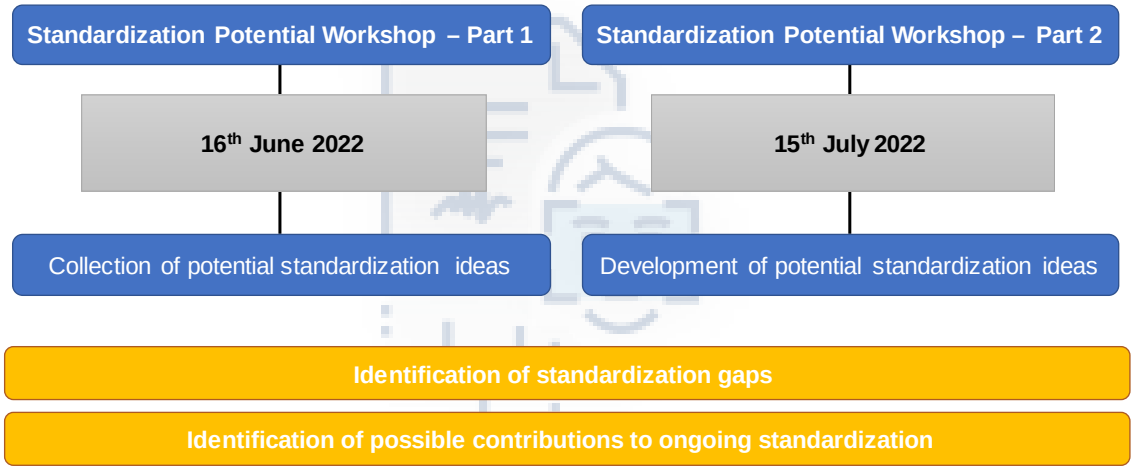
DIN – Madlen Schmudde and René Lindner

Hybrid, 15th July 2022

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101004459

Impulse

Structure of this Workshop



2

How can we participate as a project in standardization?

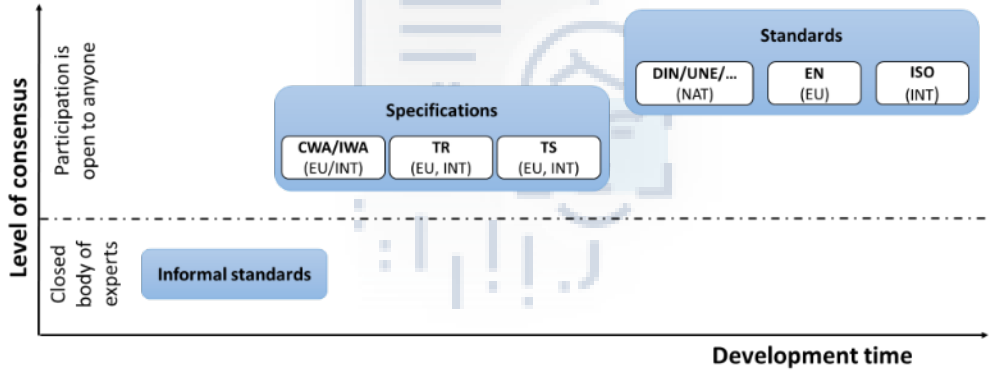
Contribution to ongoing standardization activities	Development of new workshop agreements	Exploitation of standardization ideas
Liaison with Technical Committees	Identification of standardization potentials / needs during the workshop	Identified standardization needs which cannot be developed further in the project are provided to relevant TC's for future consideration (via liaison or direct contact to TC)
Taking part in discussions within relevant TCs / WGs	Develop the content together with other interested organizations	
Commenting on draft standards	CEN Workshop Agreement (basis for future e. g. CEN / ISO standard)	

Dissemination of IMPULSE results

3

How can we participate as a project in standardization?

Types of standardization documents



4

How can we participate as a project in standardization?

Possible Liaisons with working groups at CEN and ISO

- **CEN/CLC/JTC 19 Blockchain and Distributed Ledger Technologies**
  - Decentralised Identity Management Model based on Blockchain and other Distributed Ledgers Technologies – Part 1: Generic Reference Framework
- **ISO/TC 307 Blockchain and distributed ledger technologies:**
  - ISO/AWI 7603 Decentralized Identity standard for the identification of subjects and objects
  - ISO/WD TR 23642 Blockchain and distributed ledger technologies – Overview of smart contract security good practice and issues
- **CEN/TC 224 Personal identification and related personal devices with secure element, systems, operations and privacy in a multi sectorial environment:**
  - European Digital Identity Wallets standards Gap Analysis
  - Personal identification – European guide for verification applications based on ID documents (EVG)
  - Personal identification – Use of biometric verification data across EU countries and scenarios

AWI: Approved work item
WD: Working draft

5

How can we participate as a project in standardization?

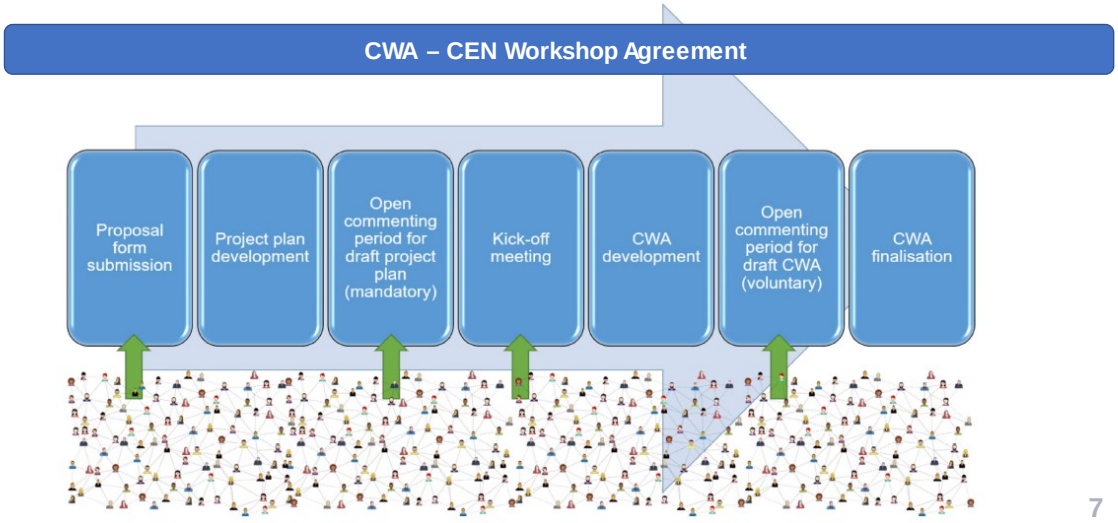
CWA – CEN Workshop Agreement

- agreed upon the group of developers, which is designed to meet an immediate need and form the basis for future standardisation activities

➢ Developed outside the technical committee structure
➢ Open to the direct participation of anyone
➢ Offers rapid development opportunities
➢ Publication within duration of project is possible

6

How can we participate as a project in standardization?



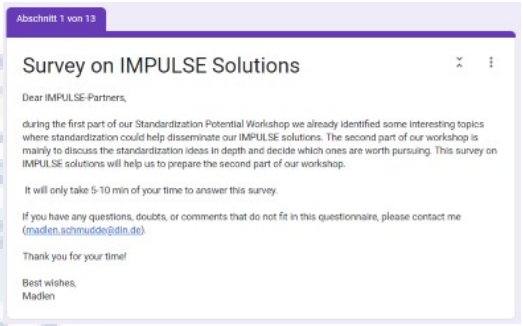
7

Survey on IMPULSE Solutions

- Goal:

→ overview which standardization ideas were collected during the first part of the workshop

→ overview of challenges in this topic with regard to IMPULSE



5 topics where identified as interesting during the last workshop

further topics were identified as interesting from the innovation radar questionnaire

- 13 participants from 10 organizations

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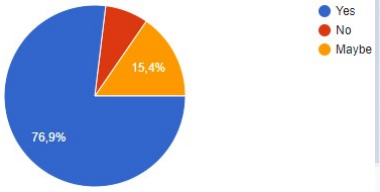
Survey on IMPULSE Solutions

Data Privacy and Data Protection



- Ensure the **correct understanding of data use/protection** (including the right meaning/understanding of the set up icons)
- **Consent form** providing clearly the rights of the citizen who uses the IMPULSE service
- Making the **icons** possibly standardisable
- Understand: **consent is managed exclusively by oneself** in a decentralized way (Smart Contracts) and the implications of this
- Achieving a **perfect balance between usability** and giving to the user all the **information** that he/she legally must have

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Data Privacy and Data Protection

- **ongoing standardisation initiatives related to consent management:**
  - *CWA 17525:2020 Elements of fair and functioning data economy: identity, consent and logging*
  - *IETF RFC 5361:2008 A Document Format for Requesting Consent*
  - *ISO/IEC 29184:2020 Information technology – Online privacy notices and consent*

CWA: CEN Workshop Agreement
IETF RFC: Internet Engineering Task Force Request for Comments

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Data Privacy and Data Protection

- **ongoing standardisation initiatives related to decentralised identity management:**
  - *UNE 71307-1:2020 Digital Enabling Technologies. Decentralised Identity Management Model based on Blockchain and other Distributed Ledgers Technologies. Part 1: Reference Framework*
  - *CEN/CLC/JTC19: Decentralised Identity Management Model based on Blockchain and other Distributed Ledgers Technologies – Part 1: Generic Reference Framework*
- **relationship between ongoing standardisation processes and their alignment with regulations such as eIDAS1, eIDAS2 and/or GDPR:**
  - *CEN/TR 419210:2019 Applicability of CEN Standards to Qualified Electronic Seal Creation Device under the EU Regulation N°910/2014 (eIDAS)*
  - *EN 419212 series Application Interface for Secure Elements for Electronic Identification, Authentication and Trusted Services*

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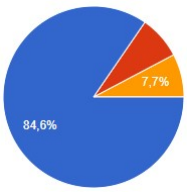
Survey on IMPULSE Solutions

Application of AI



- How to **define metrics for this evaluation**, how to and which information exchange
- Ensure an **ethical application of AI** in that context
- The **constant advance of this technology, with the changes that it implies**
- Other alternatives to Face recognition could be Fingerprint recognition.
- **Training of AI** with a small set of data
- Twins problem
- **Document Verification** : Detect physical forgery of the ID Documents
- **Avoiding the biases** connected to the application of AI to biometric data

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Application of AI

- **ongoing standardisation initiatives related to the application AI in the decentralised identity management context:**
  - No specific standards
- **relationship between ongoing standardisation processes and their alignment with regulations such as eIDAS1, eIDAS2 and/or GDPR:**
  - No specific standards
- *ETSI GR SAI 004 V 1.1.1 Securing Artificial Intelligence (SAI) - Problem Statement*

ETSI: European Telecommunications Standards Institute

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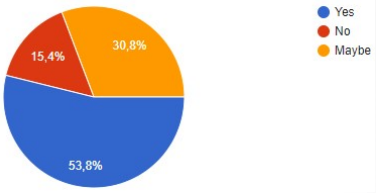
Survey on IMPULSE Solutions

e-Wallet



- Combine the **e-wallet with other digital services**
- Make a **fast, usable and interoperable service**
- The **private key management/storage**
- There is also a big challenge trying to be in accordance with the **European regulations** (eIDAS 2 and GDPR)
- The **transferability** of data from a device to another one
- user control

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e-Wallet

- **ongoing standardisation initiatives related to decentralised identity management / relationship between ongoing standardisation processes and their alignment with regulations such as eIDAS1, eIDAS2 and/or GDPR:**
- CEN/TC 224 Personal identification and related personal devices with secure element, systems, operations and privacy in a multi sectorial environment:
  - European Digital Identity Wallets standards Gap Analysis
  - Personal identification – Europeanguide for verification applications based on ID documents (EVG)
  - Personal identification—Use of biometric verification data across EU countries and scenarios

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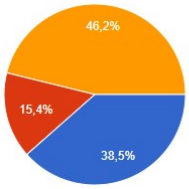
Survey on IMPULSE Solutions

Roadmapping



- **How to elaborate a roadmap**
- Ensure that the roadmaps contain **sufficient data** to be relevant and reusable
- Covering all **topics and dimensions** that are relevant for the ecosystem in which a solution like IMPULSE would be implemented
- Roadmap should consider existing enviroment and technology in each **national context** and should show the improvement with respect to the incumbent and its roadmap
- Produce a roadmap that is **truly valuable** for new experiments on SSIs in an european context.

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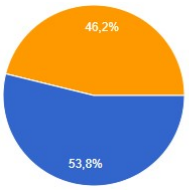
Survey on IMPULSE Solutions

Assessment Tool



- **Definition** of metrics, group of users, questionnaires, etc.
- Ensure that the tool is **sufficiently exhaustive / comprehensive** in its assessment but provides an **understandable output**
- assessment tool must be able to analyze PA backends, datacenters, type of services, hardware available, and **identify if some minimal requirements** for the IMPULSE solution are fulfilled
- the very question of whom the solution serves over and above others

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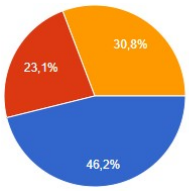
Survey on IMPULSE Solutions

ID Verification Service



- How **to define the metrics and exchange information** with other systems
- Difficulty getting a **high volume of ID documents**
- **Detect physical forgery** of the ID Documents.
- Avoiding the need for a **human intervention** in the ID verification process
- The weakest link continuing to be the **verification that a person is indeed the holder** of an identity document

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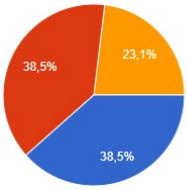
Survey on IMPULSE Solutions

Remote qseal Service for Verifiable Credential



- is there a possiblity to prevent that the **change in the regulation** will make necessary a change in the technology (say, EIDAS2 and the registering of the public key on blockchain)?
- Remote key management/storage

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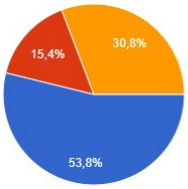
Survey on IMPULSE Solutions

Decentralized Identity Management Solution compliant with the European Self Sovereign Identity Framework (EBSI/ESSIF) focused on Public Administrations



- Integration mechanisms
- **Deploy the service** to different environments in different public administrations
- Be in **compliance** with eIDAS2 and GDPR
- Integration with **different cryptographic hardware modules**
- Develop the **User Mobile Application** so it can be used by the maximum number of devices possible / in the most accessible way possible
- The IMPULSE solutions pass the **regulatory hurdles** (security mainly)

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Decentralized Identity Management Solution

- **ongoing standardisation initiatives related to decentralised identity management:**
  - *UNE 71307-1:2020 Digital Enabling Technologies. Decentralised Identity Management Model based on Blockchain and other Distributed Ledgers Technologies. Part 1: Reference Framework*
  - *CEN/CLC/JTC19: Decentralised Identity Management Model based on Blockchain and other Distributed Ledgers Technologies – Part 1: Generic Reference Framework (possible liaison)*

- **relationship between ongoing standardisation processes and their alignment with regulations such as eIDAS1, eIDAS2 and/or GDPR:**
  - *EN 419212 series: Application Interface for Secure Elements for Electronic Identification, Authentication and Trusted Services*

- **ISO/IEC DIS 23220-1** *Cards and security devices for personal identification — Building blocks for identity management via mobile devices — Part 1: Generic system architectures of mobile eID systems*

DIS: Draft international standard

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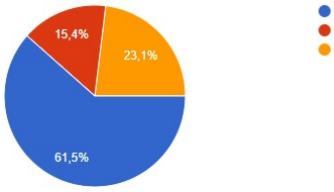
Survey on IMPULSE Solutions

Enrolment and Authentification to Access online Public Services



- **Use of AI** in this context.
- How to **assess** to what extend it is reliable and citizens trust it
- Still remain **unclear** on how the Blockchain technology works, and how data is protected within this technology
- Are **SC** a stand alone disruptive technology?
- **Securing** of the processes
- Make processes easy to **understand** by the users (even self-explained)
- Liability and smoothness of the **process**
- **Onboarding**

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Enrolment and Authentification to Access online Public Services

- **ongoing standardisation initiatives related to decentralised identity management:**
- CEN/TC 224:
  - *Personal identification—Use of biometric verification data across EU countries and scenarios* [under Drafting]
  - *Personal identification– European guide for verification applications based on ID documents (EVG)* [Preliminary]
  - CEN/TS 16634:2014 Personal identification Recommendations for using biometrics in European Automated Border Control
  - CEN/TS 17661:2021 Personal identification– European enrolment guide for biometric ID documents (EEG)

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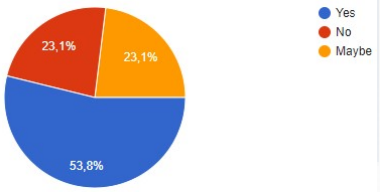
Survey on IMPULSE Solutions

Guideline on how to handle Needs and Concerns of Stakeholders



- Ensure **sufficient collection of needs** (taking into account the difficulty of the actors themselves to sometimes define these needs) and define a solution that meets them as closely as possible
- Focus groups, interviews and workshops need to be organized in order to **understand those concerns**
- Concentrating on the **most relevant issues**

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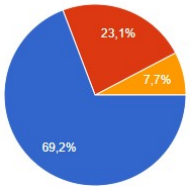
Survey on IMPULSE Solutions

SSI at the Core of a User -Centric eID Approach



- Is the user able to **manage** his/her own personal data and to know in each moment to what extent personal data is shared and needed ?
- What assures us that the user will **perceive SSI as the best solution**, and not, for instance, a more privacy-aware private corp that provide the same type of federated services.
- General **adoption of SSI** throughout Europe
- **Communicating** the advantages of this solution to the citizens
- **User control** & the entrenchment of **centralised registries** of resident populations against which identification (in - person or electronic/digital) is verified

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Further Work on Conceptboard

- **Let's move to the concept board:**
- https://app.conceptboard.com/board/fb6x -rexr-fxer-brtf-mo4g

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Identity Management in PUbLic SErvices

René Lindner – rene.lindner@din.de
Madlen Schmudde – madlen.schmudde@din.de

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A.1.7 Conceptboard standardization potential workshop – part 2

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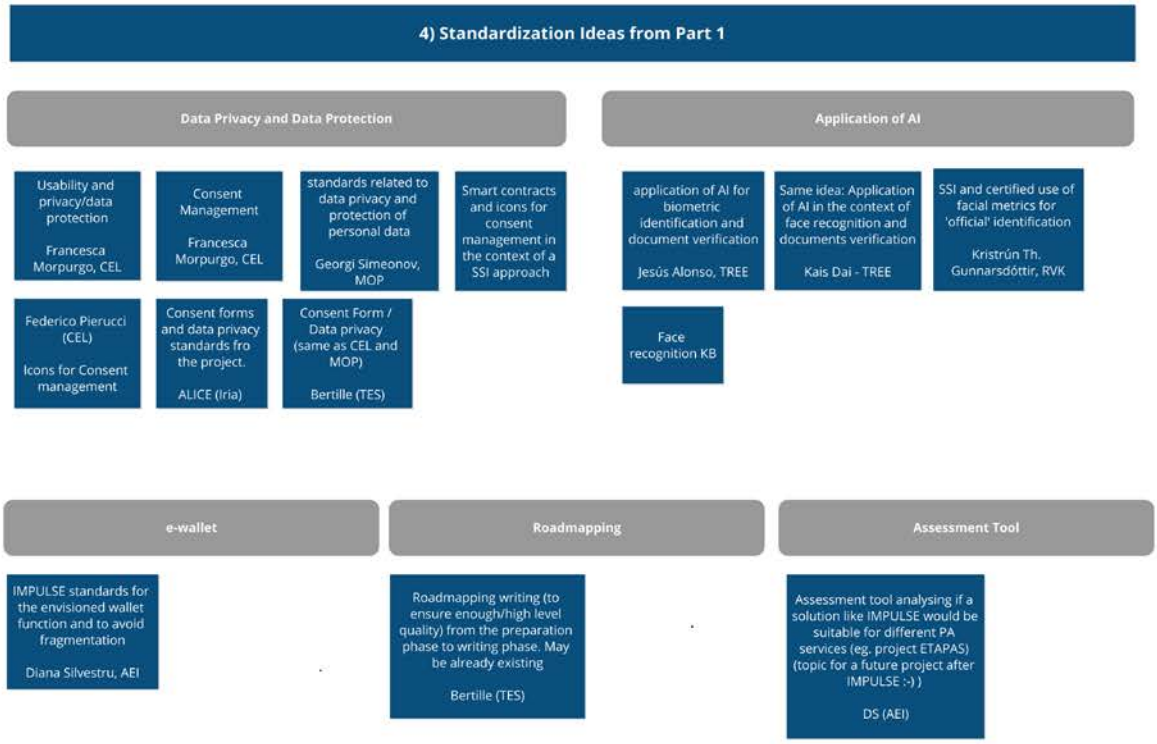
Standardization Potential Workshop - Part 2



Impulse
Standardization Potential Workshop - Part 2
5) IMPULSE Solutions - Summary from the survey
Data Privacy and Data Protection
This topic includes consent management in general, icons which simplify the consent management process for the user but also the topic of smart contracts.
Ensuring the correct understanding of data use/protection (including the right meaning/understanding of the set up icons)
Consent form providing clearly the rights of the citizen who uses the IMPULSE service
Making the icons possibly standardisable
Achieving a perfect balance between usability and givint to the user all the information that he/she legally must have
Application of AI
This topic covers the application of AI in the context of face recognition and / or document verification.
How to define metrics for this evaluation, how to and which information exchange
Ensure an ethical application of AI in that context
Training of AI with a small set of data
Document Verification: Detect physical forgery of the ID Documents
Avoiding the biases connected to the application of AI to biometric data
e-Wallet
This topic covers the envisioned wallet functions and ways to avoid fragmentation.
To combine the e-wallet with other digital services
Make a fast, usable and interoperable service
The private key management/storage
There is also a big challenge trying to be in accordance with the European regulations (eIDAS 2 and GDPR)
The transferability of data from a device to another one
Roadmapping
This topic covers the process of writing a roadmap from the preparation phase to the writing phase with regard to a high level of quality.
How to elaborate a roadmap
Ensure that the roadmaps contain sufficient data to be relevant and reusable
Produce a roadmap that is truly valuable for new experiments on SSIs in an european context.
Assessment Tool
This assessment tool is for analysing if a solution like IMPULSE would be suitable for different PA services.
Definition of metrics, group of users, questionnaires, etc.
Ensure that the tool is sufficiently exhaustive / comprehensive in its assessment but provides an understandable output
assessment tool must be able to analyze PA backends, datacenters, type of services, hardware available, and identify if some minimal requirements for the IMPULSE solution are fulfilled
ID Verification Service
A service to assess that an ID document is genuine.
How to define the metrics and exchange information with other systems
Difficulty getting a high volume of ID documents
Detect physical forgery of the ID Documents.
Avoiding the need for a human intervention in the ID verification process
The weakest link continuing to be the verification that a person is indeed the holder of an identity document
Remote qseal Service for Verifiable Credential
This will be used for remote digital sealing of VCs, in the context of a Self-Sovereign Identity issuing service implemented in IMPULSE based on EBSI-ESSIF infrastructure
is there a possiblity to prevent that the change in the regulation will make necessary a change in the technology (say, EIDAS2 and the registering of the public key on blockchain)?
Remote key management/storage
Decentralized Identity Management Solution
A modular and ESSIF-compliant decentralized identity management solution for the purposes of users registration and authentication with online services.
Integration mechanisms
Deploy the service to different environments in different Public administrations
Be in compliance with eIDAS 2 and GDPR
Develop the User Mobile Application so it can be used by the maximum number of devices possible / in the most accessible way possible
Enrolment and Authentification to Access online Public Services
By combining existing and disruptive technologies IMPULSE aims to transform the two critical processes required to access the online public services.
Use of AI in this context: How to assess to what extend it is reliable and citizens trust it
unclear on how the Blockchain technology works, and how data is protected within this technology
Securization of the processes.
Make them easy to understand by the users (even self-explained)
Guideline on how to handle Needs and Concerns of Stakeholders
Each stakeholder group has a unique set of needs and concerns, which shall be addressed by the IMPULSE eID solution.
Ensure sufficient collection of needs (taking into account the difficulty of the actors themselves to sometimes define these needs) and define a solution that meets them as closely as possible
Focus groups, interviews and workshops need to be organized in order to understand those concerns
Concentrating on the most relevant issues
SSI at the Core of a User-Centric eID Approach
IMPULSE proposes a secure + privacy preserving alternative for existing eID management systems, being the SSI concept at the core.
General adoption of SSI throughout Europe
Communicating the advantages of this solution to the citizens
User control & the entrenchment of centralised registries of resident populations against which identification (in-person or electronic/digital) is verified.

Impulse

Standardization Potential Workshop - Part 2

6) What would be the most interesting Topic for you?

Data Privacy and Data Protection (10)

This topic includes consent management in general, icons which simplify the consent management process for the user but also the topic of smart contracts.

Application of AI (6)

This topic covers the application of AI in the context of face recognition and / or document verification.

e-Wallet (7)

This topic covers the envisioned wallet functions and ways to avoid fragmentation.

Roadmapping (6)

This topic covers the process of writing a roadmap from the preparation phase to the writing phase with regard to a high level of quality.

Assessment Tool (7)

This assessment tool is for analysing if a solution like IMPULSE would be suitable for different PA services.

ID Verification Service (6)

A service to assess that an ID document is genuine.

Remote qseal Service for Verifiable Credential (5)

This will be used for remote digital sealing of VCs, in the context of a Self-Sovereign Identity issuing service implemented in IMPULSE based on EBSI-ESSIF infrastructure

Decentralized Identity Management Solution (6)

A modular and ESSIF-compliant decentralized identity management solution for the purposes of users registration and authentication with online services.

Enrolment and Authentification to Access online Public Services (7)

By combining existing and disruptive technologies IMPULSE aims to transform the two critical processes required to access the online public services.

Guideline on how to handle Needs and Concerns of Stakeholders (7)

Each stakeholder group has a unique set of needs and concerns, which shall be addressed by the IMPULSE eID solution.

SSI at the Core of a User-Centric eID Approach (6)

IMPULSE proposes a secure + privacy preserving alternative for existing eID management systems, being the SSI concept at the core.

Voting from the survey

Data Privacy and Data Protection: 10x yes, 2x maybe, 1x no

Application of AI: 11x yes, 1x maybe, 1x no

e-Wallet: 7x yes, 4x maybe, 2x no

Roadmapping: 5x yes, 6x maybe, 2x no

Assessment Tool: 7x yes, 6x maybe, 0x no

ID Verification Service: 6x yes, 4x maybe, 3x no

Remote qseal Service for Verifiable Credential: 5x yes, 3x maybe, 5x no

Decentralized Identity Management Solution: 7x yes, 4x maybe, 2x no

Enrolment and Authentification to Access online Public Services: 8x yes, 3x maybe, 2x no

Guideline on how to handle Needs and Concerns of Stakeholders: 9x yes, 1x maybe, 3x no

Impulse

Standardization Potential Workshop - Part 2

7.1) In-depth Development of the Ideas regarding their Standardization Potential

Idea 1: Data Privacy and Data Protection

Which activity (work package, deliverable, solution) forms the basis for this proposal?

Deliverable 5.4 - Smart Contracts and Icons (Francesca)

Deliverable 1.3 legal Framework (Francesca)

Activities of WP5 (Jaime)

Incorporate Secure Elements (TPMs, HSMs, TEEs) in both wallets (user and PAs) to duly protect the identity user information (Jaime)

Elements of D4.1 (Social Assessment) might be useful (Nicholas)

building on the lessons learned by PA staff who actually recruit and deal personally with trial participants on the matter of privacy and protection (Kristrun) -

..i.e., the realities of confidence and confidentiality in trial management can expose issues that otherwise are missed

Which challenge should be tackled by developing a specification?

Manage consents for citizens must be easy (Pedro)

Giving users/citizens genuine transparency over the data flows and data usages

And the opportunity to modify or delete them (Pedro)

Why is this topic also important for other stakeholders?

Regulation compliant (GDPR, eIDAS)

What is already on the market and how does the envisaged specification differ from it?

Relevant commercial laws & regulations (GDPR, CCPA, HIPAA, etc.)

ISO 27001 and 27701 (ISMS in general)

NIST recommendation + guidelines

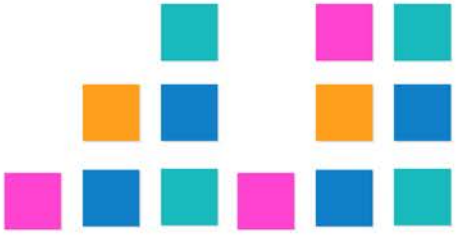
Scope: What is the specification about?

This document specifies the consent management for eID systems. This includes icons which simplify the consent management process for the user but also the topic of smart contracts. (René)

Scope: Who is the target group of this specification?

Which elements need to be included in the specification?

Problems with the notes? Take one of them...



Impulse

Standardization Potential Workshop - Part 2

7.2) In-depth Development of the Ideas regarding their Standardization Potential

Idea 2: Application of AI

Which activity (work package, deliverable, solution) forms the basis for this proposal?

Which challenge should be tackled by developing a specification?

Why is this topic also important for other stakeholders?

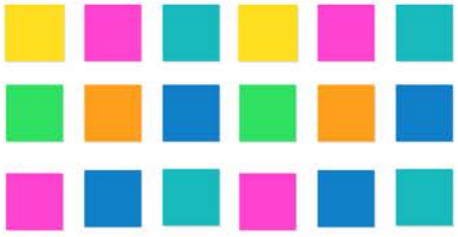
What is already on the market and how does the envisaged specification differ from it?

Scope: What is the specification about?

Scope: Who is the target group of this specification?

Which elements need to be included in the specification?

Problems with the notes? Take one of them...



Impulse

Standardization Potential Workshop - Part 2

7.3) In-depth Development of the Ideas regarding their Standardization Potential

Idea 3:

Which activity (work package, deliverable, solution) forms the basis for this proposal?

Which challenge should be tackled by developing a specification?

Why is this topic also important for other stakeholders?

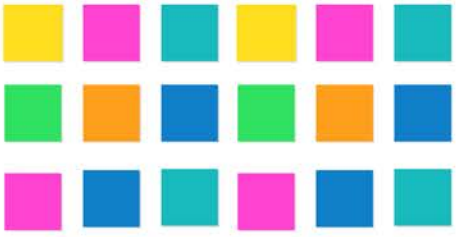
What is already on the market and how does the envisaged specification differ from it?

Scope: What is the specification about?

Scope: Who is the target group of this specification?

Which elements need to be included in the specification?

Problems with the notes? Take one of them...



A.1.8 Google form development of standardization ideas

IMPULSE - In-depth Development of Standardization Ideas

Dear IMPULSE-Partners,

within our two-part Standardization Potential Workshop you hopefully got an impression on how an R&I project like IMPULSE can contribute to ongoing standardization activities. In the second part of our workshop we have polled the interest for speci c standardization potentials.

This survey now is for the in-depth development of the standardization ideas which will be the basis for our project plan for our speci cation. We selected two promising ideas for the further development of the speci c content and will afterwards decide which is the most promissing one to go on with.

Please take your time while answering the survey. You will need around 15 min for it.

If you have any questions, doubts, or comments that do not t in this questionnaire, please contact me (madlen.schmudde@din.de).

Thank you for your time!

Best wishes, Madlen

* required question

Personal Information

1. Name *

2. Partner Affiliation *

Idea 1: Application of AI and Blockchain in Used Cases - Identity Management in Public Services

This idea is a combination of several topics which where rated as interesting during the standardization potential workshop. Within a specification with this topic we could include the following items:

- Assessment of requirements (needs and concerns)
- Potential solutions: Which solutions are the most suitable ones for public services?
- How to apply these solutions?
- different requirements of the city cases city cases as an example in the annex

The advantage of this proposal is that most of the IMPULSE results can be integrated in one document.

1. Is this a topic of interest for you? *

o Yes

o No

2. Which activities (work package, deliverable, solution) form the basis for this?

3. What would be your individual motivation/interest for developing a specification on such a topic?

4. Which challenge should be tackled by developing this topic?

5. What are the benefits to have a specification on this topic?

6. Who is the target group of this specification?

7. Why is this topic also important for other stakeholders?

8. What should be part of the scope of a specification in this topic area?

9. What should be possible further elements of a specification in this subject area?

10. What should explicitly not be part of this specification?

11. How would you like to contribute to the development of such a specification? *

Select all applicable answers.

- o Initiator of this specification
- o Main contributor
- o Contributor
- o not at all

Idea 2: Consent Management for eID Solutions

This topic includes consent management in general for eID solutions like IMPULSE but could further include the following items:

- ensuring the correct understanding of data use/protection
- usage of icons for simplifying the consent management process for the user smart contracts in general
- consent forms providing clearly the rights of the citizen who uses eID solutions like the IMPULSE service
- achieving a perfect balance between usability and giving to the user all the information that he/she legally must have

1. Is this a topic of interest for you? *
   - o Yes
   - o No

2. Which activities (work package, deliverable, solution) form the basis for this?

3. What would be your individual motivation/interest for developing a specification on such a topic?

4. Which challenge should be tackled by developing this topic?

5. What are the benefits to have a specification on this topic?

6. Who is the target group of this specification?

7. Why is this topic also important for other stakeholders?

8. What should be part of the scope of a specification in this topic area?

9. What should be possible further elements of a specification in this subject area?

10. What should explicitly not be part of this specification?

11. How would you like to contribute to the development of such a specification?*

- o Initiator of this specification
- o Main Contributor
- o Contributor
- o not at all

Thank you very much for your contribution!

A.2 Liaison contract for CEN/TC 224

AGREEMENT OF LIAISON

CEN, the European Committee for Standardization, an International Non-Profit Organization incorporated under Belgian law the registered office of which is at 23, rue de la Science, 1040 Brussels, duly represented by Mrs Elena Santiago Cid, acting in capacity of Director General, on the one hand, and the Organization, indicated as the Liaison Organization in the "Agreement Specific Terms" hereafter, on the other hand,

AGREEMENT SPECIFIC TERMS

The Liaison Organization

Name of the EU research project/consortium	IMPULSE - Identity Management in PUbLic SErvices
Duration of the project	From 2021-02-01 to 2024-01-31 (see also Art. 6.1)
Legal status	a consortium of a funded EU research project
Registered in	
Registration number	grant agreement No 101004459
Project Coordinator	Alicia Jiménez Gonzålez

Administrative Details

EU research project/consortium reprented by	Gradiant
Legal status	Foundation
Registered in	Re istro Unico de Fundaciones de Interés Galle 0 2008/7
Registration number	G36997229
Registered address	Carretera do Vilar 56-58, 36214 Vi o, Pontevedra, Es aha
Telephone	+34 986 120 430
E-mail (official communication)	gradiant@gradiant.org
E-mail (daily management)	aiimenez@gradiant.org, madlen.schmudde@din.de

Invoicing Details

Invoicing address	DIN Deutsches Institut fur Normung e. V.; Zentraler Rechnungseingang; Postfach 30 30 09; 10730 Berlin
Invoicing addressee	Dr. Madlen Schmudde
Contact person name	Dr. Madlen Schmudde
Contact telephone number	+49 30 2601-2763
VAT number (ifapplicable)	DE136622143

Technical Committees/Bodies:	See Annex 1

1.

hereinafter referred to individually as "the Party" or collectively as "the Parties."

Whereas

- CEN has the institutional responsibility and authority, in compliance with Regulation (EU) 1025/2012, for proposing, editing and adopting European Standards and other technical deliverables for products and services brought on the European market;
- The CEN General Assembly has defined the principles covering the CEN policy of partnership with all stakeholders in the CEN-CENELEC Internal Regulations Part 2 and CEN-CENELEC Guide 25 "The concept of partnership with European Organizations and other stakeholders";
- "Identity Management in PUbLic Services" "IMPULSE' (hereinafter as 'Liaison Organization') as a consortium has expressed an interest to enter into a liaison agreement with CEN;
- CEN and the Liaison Organization recognize the value of cooperating together to facilitate the adoption of European Standards and other technical deliverables;
- The aim of the European research and innovation project IMPULSE — Identity Management in Public Services aims to transform the approach on digital identity by drawing up a user-centric multi-stage method of multidisciplinary evaluation of elD management in providing public services. Within the project the benefits but also risks, costs and limitations, considering socio-economic, legal, ethical and operational impacts are evaluated together with framework conditions (GDPR and elDAS regulations, and existing legacy elD national systems and standards). To improve electronic identities IMPULSE uses two disruptive technologies: blockchain and artificial intelligence (Al). IMPULSE develops a framework for a holistic integration of Al and blockchain technology to support privacy-preserving elD management by public services. Further, actionable roadmaps for the adoption, escalation and sustainability of advanced elD technology by public services in the European ecosystem are developed.
- Noting that the IMPULSE project does not have a legal personality, it is hereby agreed that the Project (formed by the collection of its members) it is being represented for the purpose of the signature of this Agreement by Gradiant (see details in page 1 of this Agreement).
- The Liaison Organization is willing to contribute to the work of identified CEN Technical Committee(s)/Body(ies) by providing added-value expertise and high quality contributions through direct participation of its representatives in their meetings;
- The Liaison Organization is eligible to such status of partnership with CEN in accordance with the criteria established in CEN-CENELEC Guide 25 and the CEN-CENELEC Internal Regulations - Part 2;
- The relevant CEN Technical Committee(s)/Body(ies), by delegation from the Technical Board, has approved the establishment of this liaison status;
- The members of the Liaison Organization and their experts will continue to contribute to all activities at national level of the relevant technical bodies of the National Standardization Bodies Members of CEN.

Both Parties have agreed upon the following:

Art 1. Scope of this Agreement

This Agreement, by defining the rights and obligations of the Parties, aims at facilitating the contribution of the Liaison Organization to the relevant CEN activities at technical level to ensure high quality and consensusbased technical deliverables.

Art 2. Status of Liaison Organization and indication of Technical Committee(s)/Body(ies)

2.1 CEN grants the status of Liaison Organization to the Organization indicated in the "Agreement Specific Terms" herein, who accepts it.

2.2 The status of Liaison Organization is granted for the Technical Committee(s)/Body(ies) listed in Annex 1 at the time of the signature of this Agreement.

2.3 The Liaison Organization may request at any time to CEN to be allowed to participate in additional Technical Committee(s)/Body(ies) or to withdraw from them. Any participation in new

Technical Committee(s)/Body(ies) shall be granted by CEN in accordance with the provisions of the CENCENELEC Internal Regulations - Part 2 and CEN-CENELEC Guide 25.

2.4 Any modification to the list of Technical Committee(s)/Body(ies) in Annex 1 of this Agreement shall not require an amendment to the present Agreement, but shall be timely registered in the relevant CEN database by the CEN-CENELEC Management Centre and the amount of the annual financial fees shall be adapted accordingly, as defined in Art. 5.

2.5 The list indicating the Technical Committee(s)/Body(ies) to which the Liaison Organization has access is renewed automatically for the following year unless otherwise communicated to the CEN-CENELEC Management Centre by the Liaison Organization at the following email address partners@cencenelec.eu, and this by 30 November of the current year at the latest.

Art. 3. Modalities of cooperation

3.1 The Liaison Organization, with regard to the identified Technical Committee(s)/Technical Body(ies) for which liaison status has been -or will be- granted, is entitled:

a) to receive access, through the appropriate electronic tools, to the working documents associated with these Technical Committee(s)/other Technical Body(ies);

b) to appoint one representative per Technical Committee/Body and one representative for each subcommittee/working group of that Technical Committee/Body (see 4.3.2 of CEN/CENELEC Internal Regulations - Part 2). Participation of Liaison Organization representative(s) implies: no voting rights; - the possibility to propose technical documents with a view of their possible conversion into CEN deliverables, through the regular consensus and approval process;

- the possibility to introduce preparatory work as a support to ongoing standardization activities; the possibility to submit technical contributions to the body's meetings; - the possibility to formulate advice on current and future standards programmes.

3.2 The Liaison Organization ensures that the technical input provided by its representative(s) in the Technical Committees and other Technical Bodies express the consensus view of the majority of the members of the Liaison Organization.

3.3 The Liaison Organization shall contribute to the relevant CEN technical activities defined in this Agreement in full respect of the rules of the CEN-CENELEC Internal Regulations - Part 2, of other relevant guidelines, including CEN-CENELEC Guide 25, and CEN established practices.

Art. 4. Intellectual Property Rights

4.1 CEN policy and practices on Intellectual Property Rights are defined in the following CEN-CENELEC Guides: CEN- CENELEC Guide 10 on "Policy on dissemination, sales and copyright of CEN-CENELEC Publications"; CEN-CENELEC Guide 8 "Guidelines for implementation of the common Policy on Patents" (and other statutory intellectual property rights based on inventions); CEN-CENELEC Guide 24 "Use and protection of trademarks and domain-names of CEN and CENELEC" (trademarks). The Liaison Organization acknowledges that this Agreement is subject to the rules on Intellectual Property Rights as defined in these Guides.

4.2 The Liaison Organization accepts that CEN has entire and exclusive copyright on all its publications, even if these include one or more contributions from the Liaison Organization.

4.3 CEN accepts that the transfer of copyright on the Liaison Organization's contributions to CEN pursuant to Clause 4.2 does not preclude the Liaison Organization from continuing exploiting the concerned contributions for its own purposes and for its own publications.

Art. 5 Financial conditions

5.1 . The Liaison Organization is charged with an annual fee (+ VAT if applicable) as indicated in Annex 1 of CEN-CENELEC Guide 25 for its participation in the technical activities of the identified Technical Committee(s)/Body(ies) for which the liaison status is granted.

5.2. The annual fee shall be paid by the Liaison Organization within one month from the date of the invoice.

5.3 If, in the course of the year, CEN grants the Liaison Organization access to a new Technical Committee/Body(ies), CEN shall invoice the corresponding amount of annual fee to the Liaison Organization calculated from the month when the access is granted.

5.4. In case a Technical Committee/Body for which liaison status is granted is declared temporary "dormant" by CEN, for that period the Liaison Organization shall be exempted to pay the corresponding annual fees.

5.5. Should the Agreement be terminated in accordance with Art. 6.2 and 6.3 a), b) or c), there shall be no reimbursement, either partial or in full, of the annual fee paid by the Liaison Organization.

Art. 6 Duration and Termination

6.1 This Agreement enters into force at the date of the last signature for a limited period, until 2024-01-31. However, should the Liaison Organization stop participating in all the identified Technical Committee(s) and Technical Body(ies) for which liaison status is granted, the present Agreement shall remain valid, although dormant, for the following 3 years from the date of the last withdrawal. If the Liaison Organization does not request to reactivate or initiate new liaisons with CEN Technical Committee(s) and Technical Body(ies) before the expiry of the 3 years period, this Agreement will then be automatically terminated.

6.2 CEN or the Liaison Organization may decide to terminate this Agreement anytime upon 6 months written notice to the other party.

6.3 This Agreement shall terminate with immediate effect, upon notification, in the following cases:

a) Failure to pay annual fees: if, the Liaison Organization fails to pay, in the given payment terms, the invoice on the annual fees linked to its participation in the Technical Committee(s)/other Technical Body(ies).

b) Breach of provisions: In the event of breach of the provisions of this Agreement by the Liaison Organization, and especially those referred to in Art 3.3 and 4.1, to which it has failed to take remedy after the notification of such a breach by CEN.

c) Force Maieure: in case one of the Parties is prevented from carrying out any longer its obligations under this Agreement.

d) Dissolution or liquidation: in case either Party enters into dissolution or liquidation procedure.

Art. 7 Other provisions

7.1 All communication from CEN to the Liaison Organization shall be sent to the contact persons or to the administrative and invoicing addresses as indicated in the "Agreement Specific Terms" herein.

7.2 The Parties shall ensure that the personal information that may be necessary to be exchanged and processed within the context of their cooperation under this Agreement, will be processed in accordance with the provisions of the applicable laws, including the EU General Data Protection Regulation (GDPR), and in line with the relevant policies and practices of the Parties.

7.3 The Liaison Organization shall notify CEN in due time by email to partners@cencenelec.eu of any change related to its administrative and invoicing addresses, names of contact persons and of any other information that may be relevant for CEN to ensure an efficient management of the present Agreement. The notification of the above-mentioned changes shall not require an amendment to the present Agreement but shall be timely registered in the relevant CEN database by the CEN-CENELEC Management Centre.

7.4 The Parties undertake to make their best effort to solve amicably any difference arising out of or in connection with this Agreement.

Made in the English language in two (2) originals of which each Party retains a copy.

:e: 2023-06-25 Date:

CEN For CEN

Mrs Cinzia Missiroli
Director Standardization & Digital Solutions

Date:

For the Liaison Organization

Name: Luis Perez Freire Name: Luis ere2 Freiré

Function: Executive dirpgtpr Gradiant

CIF G36997229

Annex 1

AGREEMENT OF LIAISON ORGANIZATION WITH CEN

List of Technical Committee(s) and Technical Body(ies)*

The Liaison Organization

Name	IMPULSE Project managed by Gradiant
Registered address	Carretera do Vilar 56-58, 36214 Vigo, Pontevedra, Espafia

At the date of the signature of the Agreement, access and attendance is granted to the above Liaison Organization to:

Technical Committee/Technical Body
CEN/TC 224 - Personal identification and related personal devices with secure element, systems, operations and privacy in a multi sectorial environment

*Any change to this list agreed between CEN and the Liaison Organization shall be recorded in the relevant database at CEN-CENELEC Management Centre and will not require an amendment to this Agreement

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101004459

A.3 Material from the standardization potential workshop

Impulse

Identity Management in PUbLic SErvices

Update on Standardisation Liaison with CEN/TC 224

DIN – Madlen Schmudde

13th July 2023

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101004459

Impulse

Agenda

I. Development of Standards – Role of Technical Committees
II. Liaisons with TC's – What is this?
III. CEN/TC 224 – Overview
IV. CEN/TC 224 – WG 18 Biometrics
V. CEN/TC 224 – WG 20 Ad Hoc Group on European Digital Identity Wallets
VI. Further ongoing standardization activities / new standards to consider

2

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Development of Standards – Role of Technical Committees

3

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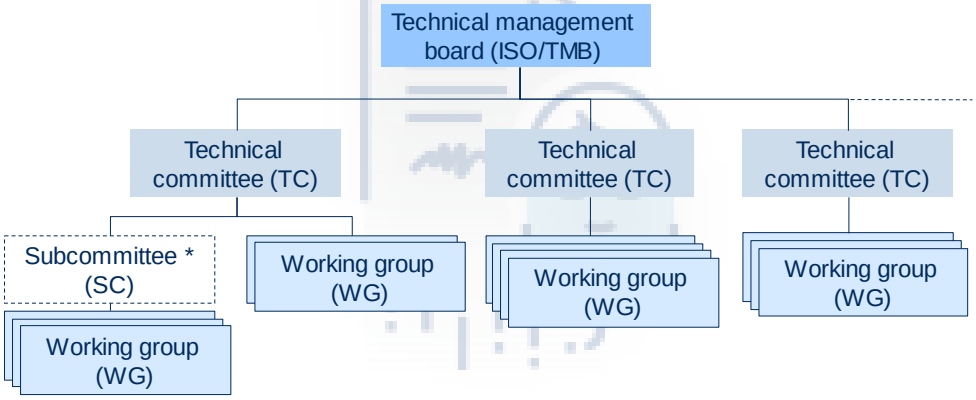
How are standards developed?

4

Technical Committees

- Standards are developed by experts within Technical Committees (TC's)



* At CEN in exceptional cases only

5

Liaisons with TC's – What is this?

6

Liaisons with TC's – What is this?

- **Contribution to the work of the TC** by providing added-value expertise and high quality contributions through direct participation of its representative in their meetings
- **Access of the working documents** associated with the TC
- No voting rights
- Possibility to propose technical documents
- Possibility to introduce preparatory work as a support to ongoing standardization activities
- Possibility to submit technical contributions to the bodys meetings
- Possibility to formulate advice on current and future standards programmes
- **Participation in TC's** as observers
- **Participation in WG's** as experts

7

Liaisons with TC's – What is this?

Opportunities:

- collaborate with TCs (or their WGs).
- receive information about the work of TCs (or WGs)
- participation in meetings
- **collaboration on standards that are currently being developed within the WG →possibility to comment on them**
- **Technical content from projects can be incorporated into standards (dissemination for project results)**

8

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CEN/TC 224– Overview

9

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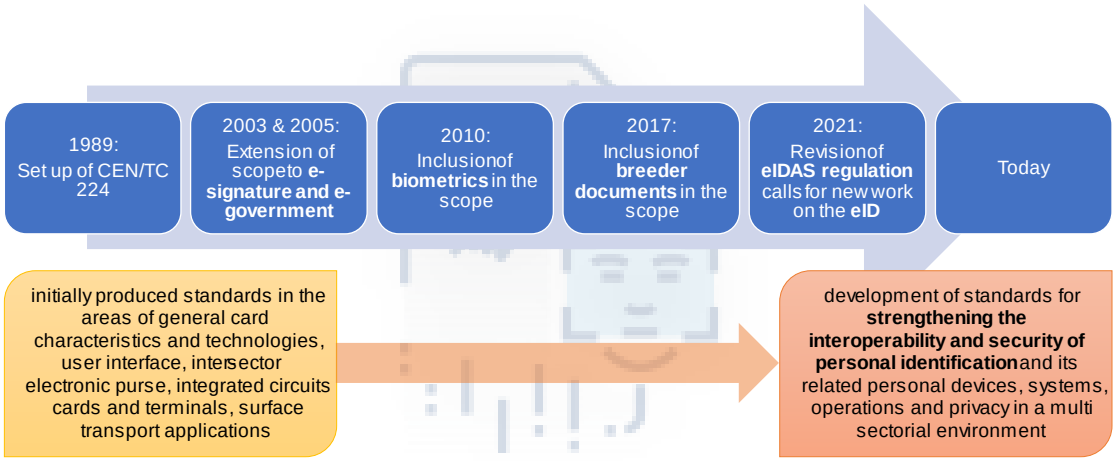
CEN/TC 224- General

CEN/TC 224 - Personal identification and related personal devices with secure element, systems, operations and privacy in a multi sectorial environment

- Secretary: AFNOR
- 10 active members : Austria, Finland, France, Germany, Norway, Spain, Sweden, Switzerland, United Kingdom, ANEC
- 32 published standards
- 64 active work items

10

CEN/TC 224 - General



11

CEN/TC 224 - General

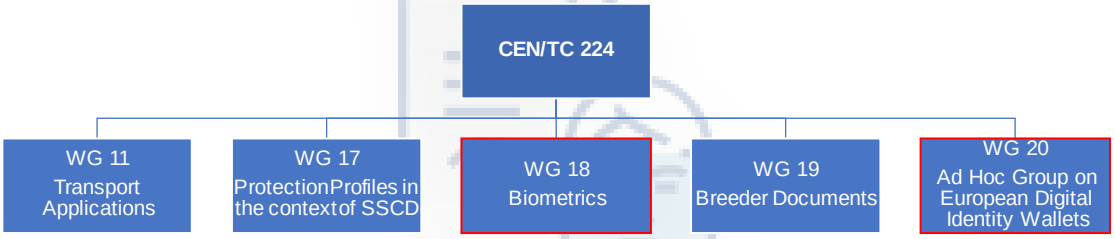
Scope covers:

- **Operations such as applications and services** like electronic identification, electronic signature, payment and charging, access and border control;
- **Personal devices with secure elements** independently of their form factor, such as cards, mobile devices, and their related interfaces;
- **Security services** including authentication, confidentiality, integrity, biometrics, protection of personal and sensitive data;
- **System components** such as accepting devices, servers, cryptographic modules;

CEN/TC 224 multi-sectorial environment involves sectors such as Government/Citizen, Transport, Banking, e-Health, as well as Consumers and providers from the supply side such as card manufacturers, security technology, conformity assessment body, software manufacturers

12

CEN/TC 224 - Structure



13

CEN/TC 224– WG 18 Biometrics

14

CEN/TC 224– WG 18 Biometrics

Current work items:

- PWI/TS Personal identification — European guide for verification applications based on ID documents (ERG)
- PWI/TS Biometric data injection attack detection
- PWI/TS Personal identification — European requirements for biometric products — Part 1: General requirements and application profile definition
- PWI/TS Personal identification — European requirements for biometric products — Part 2: Interoperability tests
- PWI/TS Personal identification — European requirements for biometric products — Part 3: Functionality evaluation methodology
- PWI/TS Personal identification — European requirements for biometric products — Part 5: Face biometrics
- PWI/TR Personal identification — Usage of biometrics in breeder documents

Input / Comments until 23rd August 2023 possible

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CEN/TC 224– WG 18 Biometrics

PWI/TS Personal identification — European guide for verification applications based on ID documents (ERG)

This technical specification defines requirements and provides guidance on

- **capturing of facial images** to be used for verification or identification purposes in applications based on reference images in identity or similar documents and traveller or visa data bases,
- **capturing of fingerprint images** to be used for verification or identification purposes in applications based on reference images in identity or similar documents and traveller or visa data bases,
- **data quality maintenance for biometric data** captured by/for verification or identification applications,
- **data authenticity maintenance for biometric data** capture by/for verification or identification applications.

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CEN/TC 224– WG 18 Biometrics

PWI/TS Personal identification — European guide for verification applications based on ID documents (ERG)

The TS addresses the following aspects which are specific for biometric data capturing:

- biometric data quality and interoperability ensurance,
- data authenticity ensurance,
- morphing and other presentation attacks and biometric data injection attacks,
- accessibility and usability,
- recognition algorithms and their evaluation,
- privacy and data protection, and
- optimal process design.

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CEN/TC 224– WG 18 Biometrics

PWI/TS Biometric data injection attack detection

This technical specification provides overview on:

- **Definitions** on Biometric Data Injection Attack.
- Biometric Data Injection Attack **use case** on main biometric system hardware for enrolment and verification
- **Injection Attack Instruments** on main biometric system including in part face, fingerprint, iris and voice.

This technical specification provides guidance on:

- System for the **detection** of Injection Attack Instruments.
- Appropriate **mitigation risk** of Injection Attack Instruments.
- Creation of **test plan for the evaluation** of Injection Attack Detection system

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CEN/TC 224– WG 18 Biometrics

PWI/TS Biometric data injection attack detection

The following aspects are out of scope:

- Presentation Attack (as they are covered into ISO/IEC 30107 standards)
- Biometric attacks which are not classified as type 2 attacks.
- Evaluation of implementation of cryptographic mechanisms like secure elements.

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CEN/TC 224– WG 18 Biometrics

PWI/TS Personal identification — European requirements for biometric products

Purpose :

- This document intends to propose a common conformity assessment scheme for the evaluation of biometric products within the context of the European Union.
- Various initiatives already exists, for example:
  - ETSI/ESI has proposed "Policy and security requirements for trust service components providing identity proofing of trust service subjects" (ETSI TS 119 461)
  - Portugal has created a regulation on the use of videoconferencing tools for citizen identification.
  - France has defined, through ANSSI a document titled "Remote identity verification service providers. Requirements rule set"
  - Spain has proposed LINCE certification scheme, which has been included in document Annex F11 of document CCN STIC-140. Additionally, Spain has also published a Technical Instruction [4] on how to conduct the evaluation required in Annex F11.
- The project intends to address this need for the case of Biometric Products, analysing and merging all current works, and defining a detailed set of requirements.

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CEN/TC 224– WG 18 Biometrics

PWI/TS Personal identification — European requirements for biometric products

Purpose :

- The proposal is multi -part. The conformity assessment scheme is defined in a biometric modality - independent point of view.
- Part 1: General requirements and application profile definition
- Part 2: Interoperability tests
- Part 3: Functionality evaluation methodology
- Part 4: Fingerprint biometrics (will include application profiles)
- Part 5: Face biometrics (will include application profiles)

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CEN/TC 224– WG 18 Biometrics

PWI/TR Personal identification — Usage of biometrics in breeder documents

This document provides guidance on usage of biometrics in breeder documents, in particular regarding

- encoding of biometric reference data,
- data quality maintenance for biometric reference data,
- data authenticity maintenance for biometric reference data, and
- privacy preservation of biometric reference data.

This document addresses advantages and disadvantages of biometric modalities, in particular regarding

- verification performance,
- privacy impact,
- feasibility of biometric acquisition considering the age of the capture subjects,
- limits of validity and need for updating biometric reference data.

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CEN/TC 224– WG 18 Biometrics

PWI/TR Personal identification — Usage of biometrics in breeder documents

The following aspects are out of scope:

- format and structure of breeder documents,
- general security aspects.

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CEN/TC 224 –WG 20 Ad Hoc Group on European Digital Identity Wallets

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CEN/TC 224 – WG 20 Ad Hoc Group on European Digital Identity Wallets

Current work items:

- CEN/TR European Digital Identity Wallets standards Gap Analysis
- CEN/TS Guidelines for the onboarding of user personal identification data within European Digital Identity Wallets

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CEN/TC 224 – WG 20 Ad Hoc Group on European Digital Identity Wallets

CEN/TR European Digital Identity Wallets standards Gap Analysis

Structure

- Identifying requirements in the proposed eIDAS Regulation
- For each identified requirement, list availlable standards, under develop mentor missing
- Propose recommendations for standards under development to fully meet requirements.
- Some stakeholders: EC, Public authorities, Standardisation Organisations – A roadmap for future standardization projects in the area.

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CEN/TC 224 – WG 20 Ad Hoc Group on European Digital Identity Wallets

CEN/TS Guidelines for the on boarding of user personal identification data within European Digital Identity Wallets

- A first working draft version has been submitted and should be finished by 2023 -09-30 →not open for comment at the moment but draft document is available

Contents

1. Concept of on-boarding and link to LoA
2. Scenario of on-boarding (kiosk, remote, face to face…)
3. Technical requirements for each scenario to meet LoA "High"
4. Requirements for conformity assessment bodies in charge of verifying procedure

- take into account privacy, data minimisation, access control etc…

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CEN/TC 224 – WG 20 Ad Hoc Group on European Digital Identity Wallets

Available information in WG folder:

- PID (Personal Identification Data) binding in the ARF (Architecture Reference Framework) 1.0: https://docs.google.com/document/d/1VMt4pU3tbaBSx1z4nmcKnocCAN14qGsyAsYAAMwm1G0/edit#heading=h.tcrzjpbflebd
- Presentation: PID binding as per ISO/IEC CD TS 23220 -4: Cards and security devices for personal identification — Building blocks for identity management via mobile devices — Part 4: Protocols and services for operational phase
- Presentation + White Paper: Concepts for Secure Wallets in Decentralised Identity Ecosystems

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CEN/TC 224 – WG 20 Ad Hoc Group on European Digital Identity Wallets

Discussions within WG 20:

- Comparison among data formats →discussion to ask pilot projects for input

	Type 1 configuration		Legacy Supported Use Cases		Additional possible Type 2 configuration (WIP)		
Profile name / use case	*SD-JWT VC*	*mdoc + MSO*	*Travel*	*Drivers license*	*AnonCreds*	*JSON-LD*	
Reference	OIDF, IETF, W3C	ISO/IEC 23220-2, 18013-5	ICAO NTWG	ISO IEC 18013-5,	Anoncreds	W3C	
Data model	W3C VC	mdoc	ICAO-DTC VC (Digital	mdoc	Anoncreds	W3C VC	
Syntax / encoding	JSON	CDDL/CBOR	ASN.1 / DER-TLV	CDDL/CBOR	JSON	JSON-LD	
Proof mechanism	SD-JWT	MSO	SOD	MSO	bitcommitment vector	Data Integrity	bitcommitment vector
Signature	JOSE, JWS	COSE	dtcSignature	COSE	CL-Signature	JWS	BBS+
Presentation transport	OpenID4VP (OIDF)	mdoc request	NFC, TLS	mdoc request	DIDComm,	DIDComm, OpenID4VP	DIDComm, OpenID4VP
Selective disclosure	Salted hashes	Salted hashes	None	Salted hashes	ZKP multimessage	No	Yes
HW support	Yes	Yes	Yes	Yes	No	Yes	No
Predicate support	No**	No**	No	No**	Yes	No	Theoretical
Cryptographic agility	Yes	Yes	Yes	Yes	No	Yes	No
Unlinkability - Multishow	No*	No*	No	No*	Yes	No*	Yes***
Unlinkability - Verifier CR	No*	No*	No	No*	Yes	No*	Yes***
Unlinkability - Issuer CR	No	No	No	No	Yes	No	Yes***
Issuer considertation	Multi-issuance is required	Multi-issuance is required	Use case determined	Multi-issuance is	tbd	tbd	tbd
Holder binding (being	Confirmation Method	CHV as drafted in	?	Portrait as in ISO18013-	Linked Secret (Blinded	Confirmation Method	Confirmation Method drafted

* Mitigated using single
** Static attributes only
*** When using

- Series of workshops from CEN/TC 224 and ETSI ESI with focus on European digital identities
- Purpose: informal exchange of ideas

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Further ongoing standardization activities / new standards to consider

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Further ongoing standardization activities / new standards to consider

new ISO/IEC 23220 series on identity management on mobile devices →parts 2 – 6 still under development (not available)

- **ISO/IEC 23220 -1:2023** Cards and security devices for personal identification — Building blocks for identity management via mobile devices — Part 1: Generic system architectures of mobile eID systems
- **ISO/IEC CD TS 23220 -2** Cards and security devices for personal identification — Building blocks for identity management via mobile devices — Part 2: Data objects and encoding rules for generic eID systems
- **ISO/IEC CD TS 23220 -3** Cards and security devices for personal identification — Building blocks for identity management via mobile devices — Part 3: Protocols and services for issuing phase
- **ISO/IEC CD TS 23220 -4** Cards and security devices for personal identification — Building blocks for identity management via mobile devices — Part 4: Protocols and services for operational phase
- **ISO/IEC CD TS 23220 -5** Cards and security devices for personal identification — Building blocks for identity management via mobile devices — Part 5: Trust models and confidence level assessment
- **ISO/IEC CD TS 23220 -6** Cards and security devices for personal identification — Building blocks for identity management via mobile devices — Part 6: Mechanism for use of certification on trustworthiness of secure area

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Further ongoing standardization activities / new standards to consider

- **ISO 22385:2023** Security and resilience — Authenticity, integrity and trust for products and documents — Guidelines to establish a framework for trust and interoperability

- **ISO 22376** Security and resilience — Authenticity, integrity and trust for products and documents — Specification and usage of visible digital seal (VDS) data format for authentication, verification and acquisition of data carried by a document or object

- **NIST SP 800-63** on digital identity guidelines: https://pages.nist.gov/800 -63-3/

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Identity Management in PUbLic SErvices

Madlen Schmudde – madlen.schmudde@din.de

This project has received funding from the European Union's Horizon 202
research and innovation programme under grant agreement No 10100445

A.4 Microsoft Forms: Follow-up on Standardization

IMPULSE - Follow-up on Standardization

* Erforderlich

Participant Information Sheet

We cordially invite you to participate in a WP7 survey on standardization within IMPULSE. Prior to making a decision, it is essential that you comprehend the purpose behind the research and the involvement it will entail for you. Kindly allocate some time to thoroughly read the following information and don't hesitate to ask any questions or seek clarification by emailing the management team.

What is the purpose of the study?
DIN, the German Institute for Standardization, will conduct a research on standardization activities within IMPULSE.
Why have I been invited to take part in the study?
You have received this invitation to participate in the survey due to your involvement in IMPULSE.
Do I have to take part?
No, your participation is not obligatory.
What will I have to do?
If you consent to participate, we kindly request you to agree with this consent form. Subsequently, you will be prompted to answer questions based on your knowledge and experiences to the best of your ability. The survey will continue until 22.09.2023, but your active involvement will require only approximately 10 minutes of your time. It is important to note that no specific advantages or disadvantages are associated with participating in this survey.
What will happen to data that I provide?
Your input will be used for the research on standardization activities within IMPULSE. Your email, if provided, will be used for questions raising during the evaluation. Your data will be anonymized when used for utilizing the gathered data for research purposes as well as for the development of reports or publications derived from the findings of this survey within IMPULSE. Your data are stored securely for at least 10 years following their last access.
Will my taking part in the study be kept confidential?
Yes, rest assured that your details will be treated with utmost confidentiality, and we are committed to adhering to ethical and legal practices throughout all study procedures. Personal data, including your email contact details, will be handled in full compliance with EU legislation to ensure that unauthorized individuals do not have access to them.
Who is organising and funding the research?
This survey is conducted under the auspices of the IMPULSE Project, which has obtained funding from the European Union's Horizon Europe research and innovation programme, pursuant to grant agreement No 101004459. Should you have any in- quiries or concerns, please do not hesitate to reach out to the management team.

madlen.schmudde@din.de

Thank you for taking the time to read this Information Sheet.

1. **Do you agree with the information provided?** *

- o Yes, I agree.
- o No, I don't agree.

Personal information

First, we would like to know more about you. Of course you can do the survey anonymously, but if we have any questions during the evaluation, the following information would help us to get back to you.

1. **What is your full name?** *

2. **What is your email adress?** *

3. **Which organization are you working for?** *

4. **What is your area of expertise?** *

- o Biometrics
- o AI
- o SSI
- o eID in general
- o none of the mentioned

Your view on standardization now...

Please answer the following question from your point of view now and with regard to the experience you made within the project.

5. Did you miss any guidance document (e.g., a standard) in your work on the project that would have simplified or made your task easier? *

- o Yes
- o No

6. If so, what would it have been and what would have been the benefit? Please describe.

7. Do you feel sufficiently informed about standardization in general and about its possibilities within IMPULSE (e.g. liaison activities, CWA development)? (1 - not at all, 5 - completely) *

8. **Do you know how to participate within standardization activities (also beyond the project)? (1- not at all, 5 - I definitely have a plan)** *

Standardization Potential 1: Application of AI and Blockchain in Used Cases

During the standardization potential workshop, "Application of AI and Blockchain in Used Cases - Identity Management in Public Services" was identified as a possible topic for a new standard from the IMPULSE project results. The idea was roughly de- scribed as follows:

This idea is a combination of several topics which where rated as interesting during the standardization potential workshop. Wit- hin a specification with this topic we could include the following items:

- Assessment of requirements (needs and concerns)
- Potential solutions: Which solutions are the most suitable ones for public services?
- How to apply these solutions?
- different requirements of the city cases
- city cases as an example in the annex

The advantage of this proposal is that most of the IMPULSE results can be integrated in one document.

9. **From your point of view now: Would it be useful to have such a standard? ***

o Yes

o No

10. Please give reasons for your answer.

Standardization Potential 2: Consent Management for eID Solutions

Within the standardization potential workshop we identified a potential topic for a new standard out of the IMPULSE project results could be "Consent Management for eID Solutions". The idea was roughly described as follows:

This topic includes consent management in general for eID solutions like IMPULSE but could further include the following items:

- ensuring the correct understanding of data use/protection
- usage of icons for simplifying the consent management process for the user smart contracts in general
- consent forms providing clearly the rights of the citizen who uses eID solutions like the IMPULSE service
- achieving a perfect balance between usability and giving to the user all the information that he/she legally must have

11. **From your point of view now: Would it be useful to have such a standard? ***

o Yes

o No

12. Please give reasons for your answer.

Last but not least - what is your opinion?

13. Please let us know if you have further questions related to standardization activities in IMPULSE or to standardization in general (e.g., how the standardization process is working).

14. Please feel free to also write us your opinion on the conducted standardization activities in IMPULSE (e.g., Did the identified standards support your work? Did our liaison activities sparked your interest in further participation in standardization?)

Dieser Inhalt wurde von Microsoft weder erstellt noch gebilligt. Die von Ihnen übermittelten Daten werden an den Formulareigentümer gesendet.

A.5 Standardization flyer

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Standardisation activities in IMPULSE project – Impact of Blockchain and Artificial Intelligence to Improve Electronic Identities

About the project

IMPULSE "Identity Management in PUbLic Services" aims to transform the mainstream discourse on digital identity by drawing up a user-centric multi-stage method of multidisciplinary evaluation of eID management that combines the bottom-up approach of co-creation with the need for a universal vision of digital identity ethics in providing public services.

Project partner

gradiant · LUT University · Ayuntamiento de Gijón · Ertzaintza · Peshtera · City of Reykjavik · City of Aarhus · UnionCamere · Fraunhofer ISI · DIN · Alice · InfoCert Tinexta Group · CyberEthicsLab · TREE Technology · Pôle TES

Case studies

- Better Reykjavik participatory democracy portal (Reykjavik, Island)
- NemID card retrieval from lockers (Aarhus, Denmark)
- Online complaints filing service (Ertzaintza, Spain)
- Enterprise digital drawer (UnionCamere & InfoCamere, Italy)
- Gijón public services app (Gijón, Spain)
- Civil registration & certification (Peshtera, Bulgaria)

Standardisation tasks in the project

Analysis of relevant standards and standardisation activities → **Identification of standardisation potentials** → **Initiation of standardisation activities**

See article at Journal of ICT Standardization: *Analysing the Standardisation Landscape for Identity Management in Public Services – A Standards Review for the IMPULSE Project*

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101004459

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For IMPULSE highly relevant standards

Document No.
CEN/TS 16921 - Personal identification – Borders and law enforcement application profiles for mobile biometric identification systems
DIN SPEC 4997 - Privacy by Blockchain Design: A standardised model for processing personal data using blockchain technology
ETSI GR SAI 001/002 - Securing Artificial Intelligence – AI Threat Ontology/ Data Supply Chain Security
ETSI TS 119 182-1 - Electronic Signatures and Infrastructures - JAdES digital signatures. Part 1: Building blocks and JAdES baseline signatures
ISO/IEC 20889 - Privacy enhancing data de-identification terminology and classification of techniques
ISO/IEC 27001 - Information technology – Security techniques – Information security management systems – Requirements
ISO/IEC 30107 series - Information technology — Biometric presentation attack detection
UNE 71307-1 - Digital Enabling Technologies – Distributed Identities Management Model on Blockchain and other Distributed Ledger Technologies. Part 1: Reference Framework

For IMPULSE relevant standardisation committees

Level	*Standardisation committee*
International	ISO/TC 307 - Blockchain and distributed ledger technologies
European	CEN-CLC/JTC 19/WG 01 - Decentralised identity management CEN/TC 224 WG18/20 - Biometrics/European Digital Identity Wallets
National (ES)	UNE CTN 71/SC 307 - Blockchain and distributed ledger technologies

- Liaison with CEN/TC 224 to provide input to ongoing standardisation work
- Participation to UNE CTN 71/307 to further work on the development of the UNE 71307 standards series and their further use on European and international level

Lessons learned

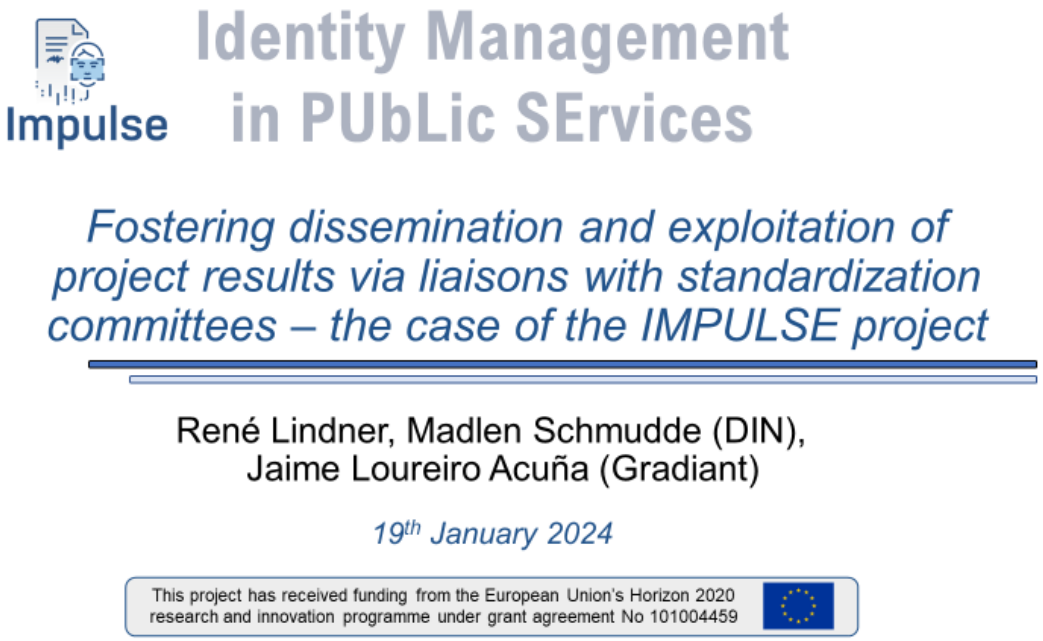
"Our participation in the UNE CTN 71 / SC 307 committee has allowed us to closely follow the standardisation tasks both at the national and international levels related to identity management through the use of decentralised ledger technologies. It has also given us first-hand insight into UNE 71307-1, the world's first standard for decentralised blockchain digital identity. This standard defines the reference framework for managing the identification of individuals or organisations, enabling them to create and control their own digital identity in a self-managed manner without the need for centralised authorities".

Jaime Loureiro Acuña, GRADIANT

IMPULSE project meeting in Reykjavik (Iceland)

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101004459

A.6 Standardization presentation at final project event



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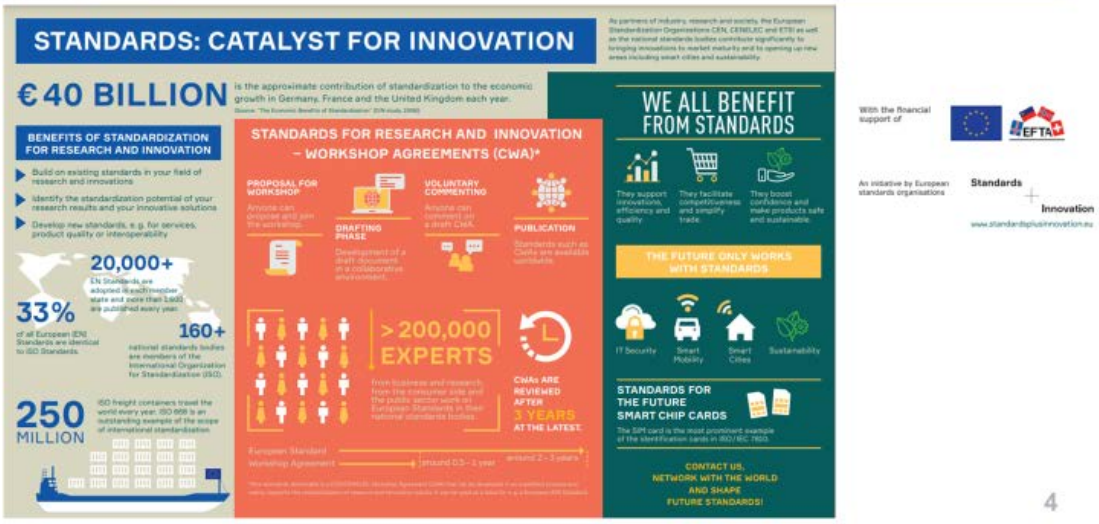
Standardization in R&I projects

3

Impulse

Standards and R&I



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Standardization in R&I projects

What	Why
Analysing existing standards and ongoing standardization activities	Use for project terminology, development of tools
Identification of standardization potentials	Review end-user needs and envisaged project results
Standardization strategy	Decide the standardization path (CWA, input to standard, etc.)
Conduction of standardization activities	Transfer project results into standardization, involve externals
Dissemination and exploitation of standardization activities	Promote results to end-users, uplift standards to EN/ISO

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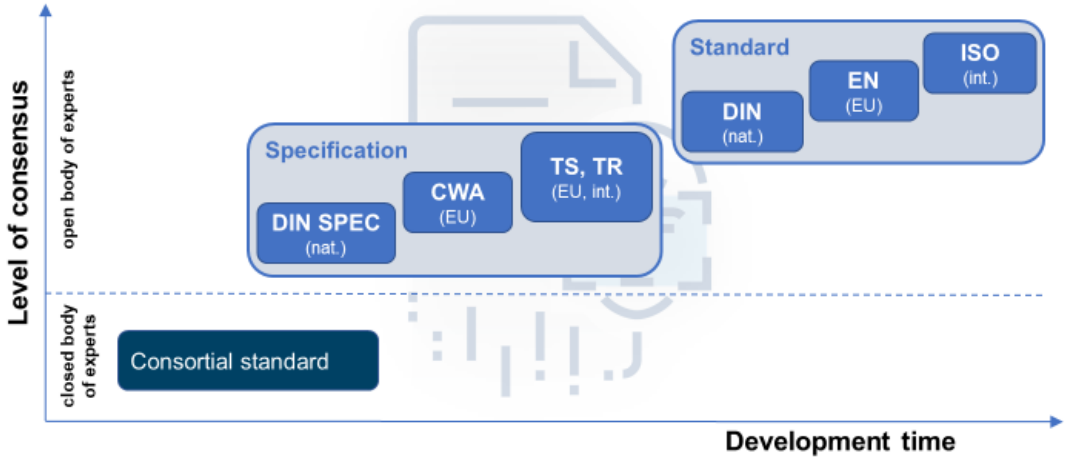
Types of standardization documents



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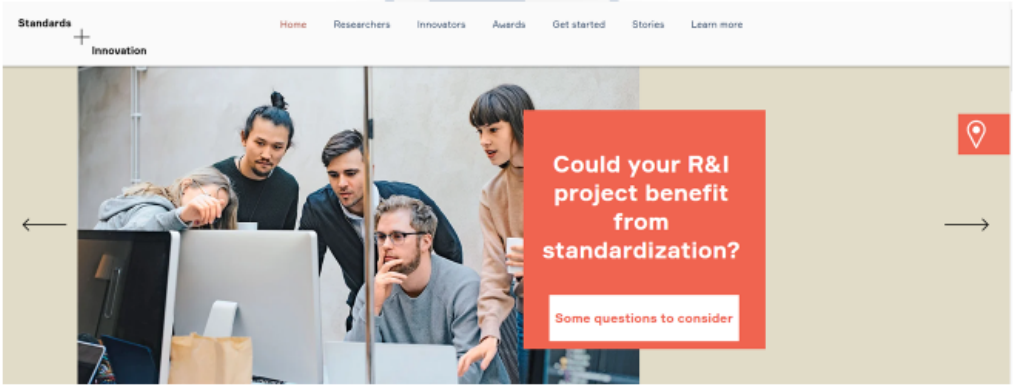
Standards+Innovation initiative

- eLearning: https://www.standardspluselearning.eu/
- S+I website: https://www.standardsplusinnovation.eu/



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Standardization approach in the IMPULSE project

8

Standardization tasks in IMPULSE

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What

- Analysing existing standards and ongoing standardization activities
- Identification of standardization potentials
- Standardization strategy
- Conduction of standardization activities
- Dissemination and exploitation of standardization activities

Where

- Task 3.4 "Analysis of existing relevant standards, and related impacts and implications"
- Task 7.6 "Initiation of standardization activities"

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Analysis of relevant standards

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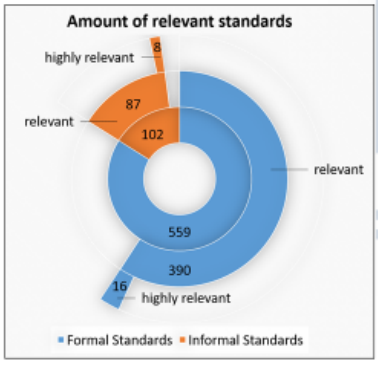
Task 3.4 "Analysis of existing relevant standards, and related impacts and implications"



Dashboard

See article at Journal of ICT Standardization:
Analyzing the Standardization Landscape for Identity Management in Public Services – A Standards Review for the IMPULSE Project

Paper

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Contribution to standardization

Task 7.6 "Initiation of standardization activities"

Identification of Standardization potentials

Contribution to ongoing standards development
vs.
Initiate development of "own" standards (e.g. CWA)

Standardization strategy

ES:

EU:

Liaison and participations

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Liaison with standardization committees

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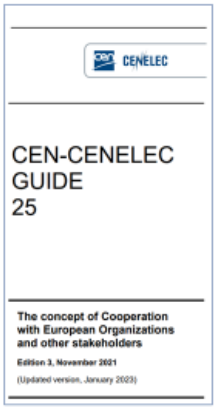
Partnership with standardization committees – Liaison with TCs



Benefits:

- Access to the working documents
- Participation in meetings of standardization committees (no voting rights, possible to propose new standards or contributions to ongoing work)

Obligations:

- Follow the common rules for standardization work (e.g. copyright policy, responsibilities, meeting structure, etc.)
- Follow provisions regarding the CEN and CENELEC Intellectual Property Rights (IPR) – e.g. use of publications or logos

Practical implementation:

- Project representative provides input to the TC

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For IMPULSE relevant standardization committees

Level	Standardization committee
International	ISO/TC 307 - Blockchain and distributed ledger technologies
European	CEN-CLC/JTC 19/WG 01 - Decentralised identity management CEN/TC 224 WG18/20 - Biometrics/European Digital Identity Wallets
National (ES)	UNE CTN 71/SC 307 - Blockchain and distributed ledger technologies

- Liaison with CEN/TC 224 to provide input to ongoing standardization work
- Participation to UNE CTN 71/307 to further work on the development of the UNE 71307 standards series and their further use on European and international level

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Lessons learned

- "Our participation in the UNE CTN 71 / SC 307 committee has allowed us to closely **follow the standardization tasks both at the national and international levels** related to identity management through the use of decentralized ledger technologies."
- "It has also given us **first-hand insight into UNE 71307-1, the world's first standard for decentralized blockchain digital identity**. This standard defines the reference framework for managing the identification of individuals or organizations, enabling them to create and control their own digital identity in a self-managed *manner without the need for centralized authorities*".

Jaime Loureiro Acuña, GRADIANT

Plenary meeting of the UNE CTN 71 / SC 307

Source: UNE (Amanda Suo)

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Identity Management in PUbLic SErvices

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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101004459