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SMILE

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Deliverable

D2.3. System Requirements and Specifications for smarter and cost-efficient land BCPs including legal/privacy issues to be solved by respective novel technologies

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List of definitions & abbreviations

Abbreviation	Definition
ANPR	Automatic Number Plate Recognition
BCP	Border Crossing Point (any crossing-point authorised by the competent authorities for the crossing of external borders – including those with minimal or no infrastructure at all, opened permanently or temporarily)
Border Gate	A permanent BCP with strong infrastructure to facilitate border checks.
Comm	Communication
ECRIS	European Criminal Records Information System
EIS	Europol Information System
eIDAS	electronic IDentification, Authentication and trust Services
ETIAS	European Travel Information and Authorisation System

EURODAC	European Dactyloscopy
HNP	Hungarian National Police (law enforcement agency responsible for border control in Hungary)
SIS	Schengen Information System
SPP	Serviciului de Protecție și Pază (Protection and Guard Service)
SUC	System Use Case
UC	Use Case
UML	Unified Modelling Language
VIS	Visa information System

Executive Summary

This document is about SMILE's system requirements; statements about what the system does (system functional requirements) and how well it does it (system non-functional requirements). Towards deriving them, we used as input the system use cases (we produced them from the use cases and user stories described in D2.2), and the so far documented user requirements (included in D2.2) and policy legal requirements (included in D8.1); so far more than 35 functional and 35 non-functional requirements have been documented. Besides that, this document discusses in brief the system's context diagram, the system's stakeholders, the system's global requirements (aka project constraints), the required system interfaces with the external entities, and finally the external datasets that will be used for testing the functionality of the to be developed biometric analysis modules. It is noted here that the work about system requirements is a continuous one and during the project's course they will be updated towards accommodating new functionalities besides refining old ones. The final outcome of this work will be included in deliverable D2.6 (M28).

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1. Introduction

The DoW describes this deliverable as: “D2.3 - System Requirements and Specifications for smarter and cost-efficient land BCPs including legal/privacy issues to be solved by respective novel technologies.”

System requirements is about documenting what the system does and how well it does it. The requirements used to describe the system’s functionalities are called (not so surprisingly) functional requirements, whereas the ones used to describe the qualities the system must have are called non-functional or quality requirements. These last ones are used to document a number of quality aspects like security, performance, maintainability, usability, legality, look & feel, and so on (an indicative list is available in the Annex). There are several frameworks and approaches for collecting the requirements, amongst them are the Volere [2] and the IEEE [4] which were used as our map towards documenting the required system’s functionalities and qualities.

The rest of the document is structured as follows:

Section 1.1 summarises the SMILE’s objectives.

Section 2 presents the system’s stakeholders.

Section 3 gives the project’s constraints (aka Global requirements).

Section 4 depicts the SMILE’s system scope

Section 5 provides definitions for the terminology used in this document

Section 6 documents the system requirements and provides a description of the system interfaces.

Section 7 holds the description of the external datasets that SMILE intends to use towards testing and validating its components and services.

Finally, **section 8** concludes the document.

1.1 SMILE Purpose

SMILE aims to provide a novel solution to the Border Crossing Point (BCP) area by building a novel mobility concept and by utilizing biometrics. In this direction, we will design, implement and evaluate several novel prototype architectures, for the accurate verification, automated control, monitoring and optimization of border traffic (pedestrians and vehicles) at Land Border Infrastructures (BCPs and Border Gates). The project’s objectives are summarized in the following table:

Code	Description
O1	Provide efficient, hierarchical (weak and strong) and unobtrusive, on the move security control
O2	Introduce the concept of biometrics-based preregistration
O3	Introduce mobile equipment and extension of e-services for BCP checks
O4	Develop a robust context aware biometric authentication framework
O5	Develop a robust multi-factor and multi-modal authentication system for BCP cases, enhanced by soft biometrics
O6	Propose and develop services running on BCPs that will enable their interconnection in a secure, interoperable and efficient manner

O7	Provide legal guidelines that should be adopted and taken into account for further designing and delivering of BCP related technologies
O8	Create a scalable and holistic paradigm for secure inner and cross-border data exchange, storage and overall handling of traveller's data in a legal and ethical way both at national and European levels
O9	Provide a detailed comparative study, about the cost reduction that is achieved by each SMILE technology in relation to the offered improvement in BCPs operation.
O10	Demonstrate, Validate, and Evaluate the SMILE BCP equipment in the context of a real BCP.
O11	Achieve SMILE technologies innovation, exploitation management and cost benefit analysis

Table 1 SMILE's objectives

2. Stakeholders

The following table provides the main stakeholders for the SMILE project:

No	Name	Description
1	BCP officers	The officers performing the border checks. Described in D2.2
2	Travellers	The people crossing the borders. Described in D2.2
3	Analysts	They will perform activities related with gathering the requirements from BCPs and converting them into Functional and Non-Functional Specifications.
4	System Architect	This entity will define the physical and logical system architecture
5	Web Designers	They will deliver the layout (design) of the system
6	Front-End Developers	They will be responsible with implementing the layout delivered by web designers
7	Developers	These are the developers that will develop the back-end functionalities of the SMILE platform.
8	System administrator	This entity will perform, during the project, all the maintenance and monitoring related with System and Database Operations.
9	Testers	The testers will verify and validate that SMILE met the user requirements.
10	Installers	This category of stakeholders will deploy SMILE solution in the BCP environments.
11	Regulators	Regulators impose constraints in the way SMILE will design, implement and deploy its solution especially as far as security and privacy aspects are concerned.

Table 2 SMILE's stakeholders

3. Constraints

This section presents the project's constraints (aka global requirements).

Constraints	Description	Rationale	Fit criterion
Solution	The SMILE system shall be conforming to the GDPR.	Conformance to the GDPR is obligatory for all EU from May 2018.	The SMILE system will handle private data according to the GDPR and the respective EU regulations.
	The product shall have interfaces to the SIS (I, II) database	It is the central source of information regarding travellers' data	The interface with the SIS Database shall conform to the respective Interface Specification Standard.
	The product shall have interfaces to the VIS database	It is the central source of information regarding Visa data	The interface with the VIS Database shall conform to the respective Interface Specification Standard.
	The SMILE devices used by the field BCP officers shall be hand-held ² .	The device shall be easy for people to carry and shall operable in low infrastructure environment, like temporary BCPs.	The device shall weigh no more than 600 grams, shall not be larger than an average tablet ³ , and there shall be no external power source.
Schedule	The system shall be available by June 30, 2020 at TRL6.	The contract with the project sponsor (EU commission) defines the deadline and TRL level.	The SMILE system and all the accompanying deliverables shall be available by June 30, 2020.

² According to recent decisions, border control authorities are moving towards the use of tablets and smartphones with integrated (encased) document, RFID and fingerprint reading capabilities and are deploying them as general control devices (either deployable as workstations in passport control booths as well as mobile passport control devices. Therefore, devices proposed as hardware system components must fulfill these general ergonomics requirements. Availability of "contactless" (wireless) charging is another must have for the devices.

³ 8.5" inch size is preferred by most of border guards, according to a representative Hungarian survey.

Budget	The SMILE solution will be realised without exceeding the project's budget.	The contract with the project sponsor (EU commission) states the agreed project's budget.	The SMILE system and all the accompanying deliverables shall be produced without exceeding the project's budget.
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Table 3 SMILE constraints

4. System Scope

The system’s scope is depicted in the following diagram showing the interactions with the external systems and actors.

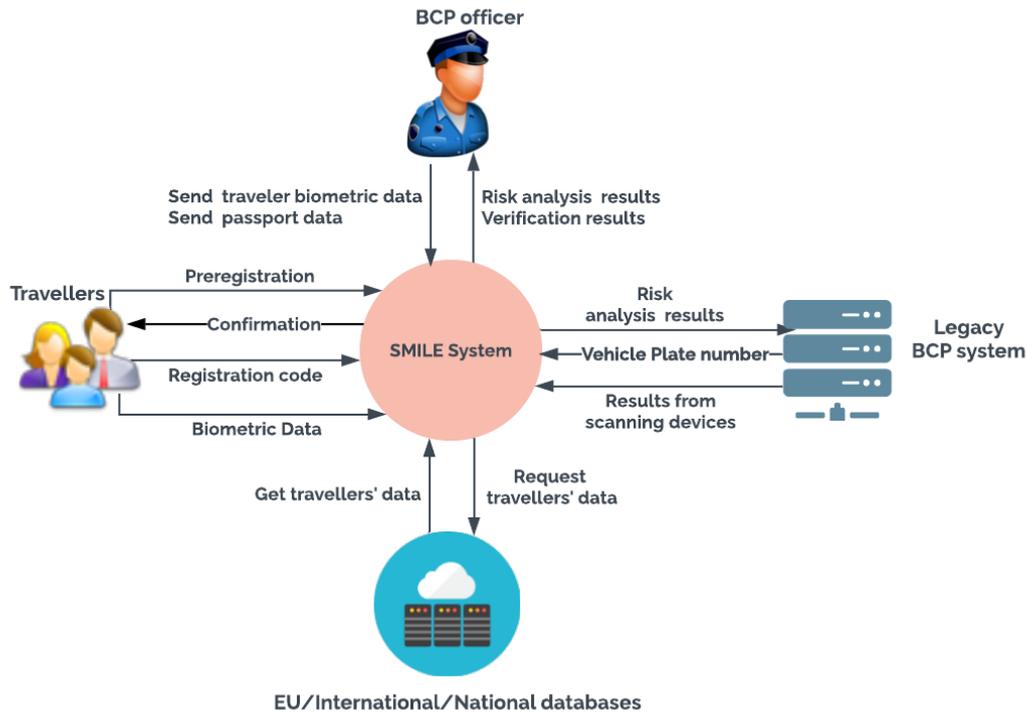


Figure 1 SMILE's system scope diagram

The Travellers can preregister using the SMILE system and receive back a confirmation message (including a preregistration code. Further to that, SMILE interacts with the external Databases (e.g. VIS, SIS II) for finding out if any alert has been issued for the preregistered travellers and/or their travelling vehicles (if any), or if they have a valid VISA (for TCN cases). Upon a traveller arrives in the fast lane, BCP officers can use SMILE towards collecting the traveller’s biometrics and document data, receive the risk analysis result for the incoming traveller, and finally proceed with the verification by comparing the collected biometrics data with the ones stored in the system. The decision to pass the border will be a matter of the inspecting BCP officer based on the verification and risk analysis results. Finally, SMILE can interact with the current legacy BCP systems towards retrieving input from scanning devices utilised currently in the legacy BCP systems such as ANPR, devices counting the number of passengers in a vehicle and so on; besides receiving information SMILE could forward to the legacy system, the risk analysis assessment (current or historical) of a preregistered traveller that has been forwarded to the standard lane.

5. Naming conventions and terminology

This section presents the terminology that is specific to the project and its requirements.

Expression	Meaning
SHALL	This word, or the terms "REQUIRED" or "MUST", mean that the definition is an absolute requirement of the specification.
SHALL NOT	This phrase, or the phrase "MUST NOT", mean that the definition is an absolute prohibition of the specification.
SHOULD	This word, or the adjective "RECOMMENDED", mean that there may exist valid reasons in particular circumstances to ignore a particular item, but the full implications must be understood and carefully weighed before choosing a different course.
SHOULD NOT	This phrase, or the phrase "NOT RECOMMENDED" mean that there may exist valid reasons in particular circumstances when the particular behaviour is acceptable or even useful, but the full implications should be understood, and the case carefully weighed before implementing any behaviour described with this label.
MAY	This word, or the adjective "OPTIONAL", mean that an item is truly optional. One vendor may choose to include the item because a particular marketplace requires it or because the vendor feels that it enhances the product while another vendor may omit the same item.

Table 4 Terminology specific to requirements documentation

Expression	Meaning
Fast lane	The lane where a traveller is forwarded if the SMILE risk analysis result is below the alert threshold.
Functional requirement	A statement describing a specific system functionality.
Non-functional requirement (aka quality requirement)	A statement describing a specific system quality (i.e. how well the system does something).
Preregistration	The process of entering the traveller's data (including biometrics) and accompanying

	vehicle(s) data to the SMILE system. The preregistration may be performed via a SMILE mobile app, a web browser, or a preregistration kiosk.
Preregistration code	A unique code returned from the preregistration process. This code is used towards routing the associated preregistered traveller(s) to the appropriate lane. The code may be saved in the SMILE's mobile app, and/or received by email.
Second line check	The line where a traveller is forwarded for further checking, if the SMILE system returns an alert, or if there is an alert during the standard lane check.
Stakeholder use case	A use case from the perspective of a stakeholder (e.g. end user). It contains a high-level description of the system's operation.
System context diagram	A diagram visualising a system's scope.
System requirement	A statement describing a specific functionality or quality of a system.
System scope	A description of the interactions of a system (seen as a Blackbox) with its external environment (i.e. users and systems). It defines what the system will do and what not. Very often this is depicted with the use of a system context diagram.
System use case	A use case from the perspective of the system. It is more technical in nature than its Stakeholder counterpart.
Use case	A Use case describes the operational usage of a system. A use case comprises of several scenarios depicting a specific interaction of the system with the external entities (actors).
User need (aka user requirement)	A user statement describing, in a high-level way, its wants and expectations from a system.

Table 5 Expressions used in this document

6. System Requirements

This section presents the system requirements; in other words what the system does (Functional requirements) and how well it does it (Non-functional requirements). Following Volere [1][2] requirements methodology and the system engineering lifecycle activities, described in [3], we elicited the system requirements using three distinct sources: the system use cases, the user needs and the policy & legal requirements. The system use cases, depicting SMILE’s functionality and behaviour from the system’s perspective, were derived from D2.2 use cases (these were based on the stakeholders’ perspective). D2.2 was also used for getting the so far documented user needs. As far as it concerns the policy & legal requirements, D8.1 was utilized.

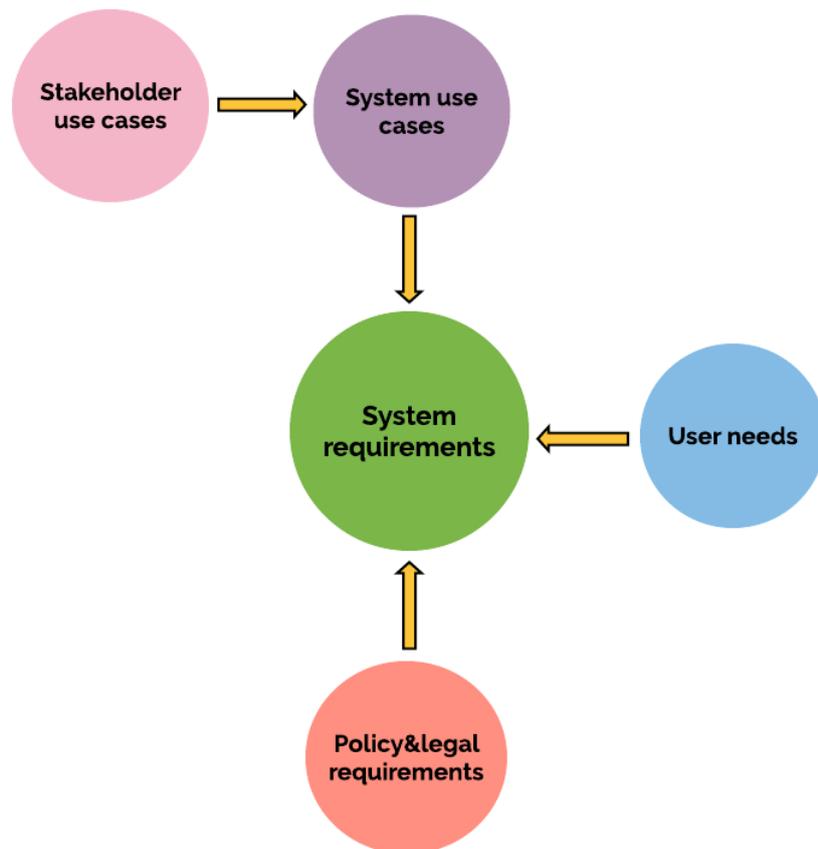


Figure 2 System requirements

6.1 System Use Cases summary

In this section, the summary of the system use cases is given along with the involved actors and the associated user stories/use cases that are described in D2.2.

No	System Use Case	Scenarios		Actor(s)	Associated User stories in D2.2
		ID	Title		
1	SMILE Preregistration	SUC1.1	Successful preregistration	Traveller, External Databases	Preregistration (Hungary-

		SUC1.2	Failed validation of the preregistration data			<i>Romania border user story</i> Pedestrian: User Stories 1, 2 and 3 (<i>General use cases</i>)
2	Fast lane check	SUC2.1	Pedestrian traveller: Successful check	Traveller, officer	BCP	Pedestrian: User Stories 1, 2 and 3 (<i>General use cases</i>)
		SUC2.2	Pedestrian traveller – Risk analysis result above threshold			
		SUC2.3	Pedestrian traveller – Biometrics matching failure			
		SUC2.4	Travellers with a car - Successful check			Car traveller: User Stories 1, 2 and 3 (<i>Bulgaria-Romania border user story</i>)
		SUC2.5	Travellers with a car – Risk analysis result above threshold			
		SUC2.6	Biometrics matching failure			

Table 6 Summary of System use cases

6.2 System Use Cases description

This section provides the system use cases and their associated scenarios using UML sequence diagrams.

6.2.1 System Use Case 1: SMILE Preregistration

In this use case, the interactions of the travellers with the SMILE preregistration system is described in a series of scenarios that include the provision of valid and not valid preregistration data. Below is the system use case diagram that depicts all the scenarios for this use case.

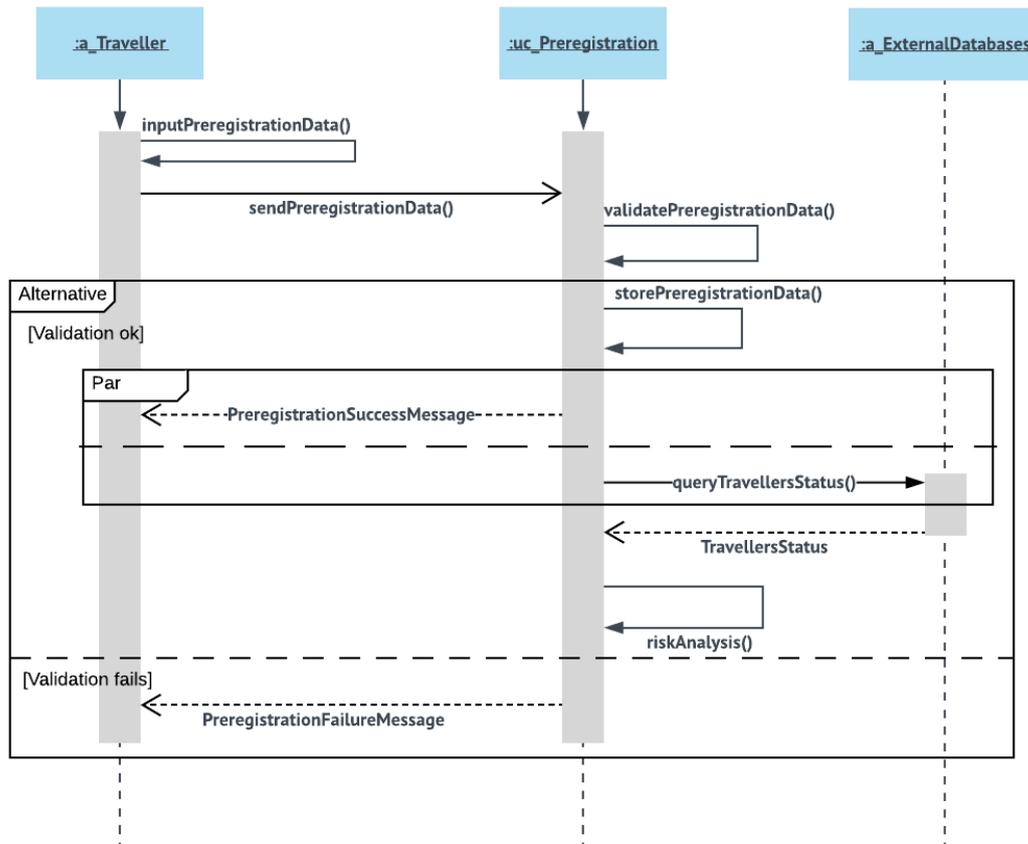


Figure 3 Preregistration – system use case scenarios diagram

6.2.1.1 Scenario SUC1.1: Successful preregistration

Description: The traveller inputs the required preregistration data, via her/his mobile phone SMILE app, to the SMILE preregistration platform where the filed data are validated, stored, and the traveller receives back a success confirmation message with a preregistration code. Based on the filed data and the responses from the external databases, a risk analysis is also carried out; its results will dictate if the associated traveller(s) will be routed to a fast lane or to a standard lane (The result of the analysis is not communicated to the traveller, whereas the routing decision becomes known to the traveller at the BCP premises upon providing the received preregistration code).

Precondition: The traveller is not preregistered with the SMILE system.

Postcondition: The traveller is preregistered with the SMILE system; the risk analysis has been performed and the traveller has received a confirmation message with a preregistration code.

6.2.1.2 Scenario SUC1.2: Failed validation of the preregistration data

Description: The traveller inputs the required preregistration data, via her/his mobile phone SMILE app, to the SMILE preregistration platform, the filed data are not validated, and the traveller receives back a failure message that includes details about the data that need to be resubmitted.

Precondition: The traveller is not preregistered with the SMILE system.

Postcondition: The traveller is not preregistered with the SMILE system and has received a failure message.

6.2.2 System Use Case 2: Fast lane check

This use case discusses a series of scenarios that include the case of successful and failed fast lane checks by travellers passing the borders on foot (pedestrian) or with a car. Below is the system use case diagram that depicts all the scenarios for this use case.

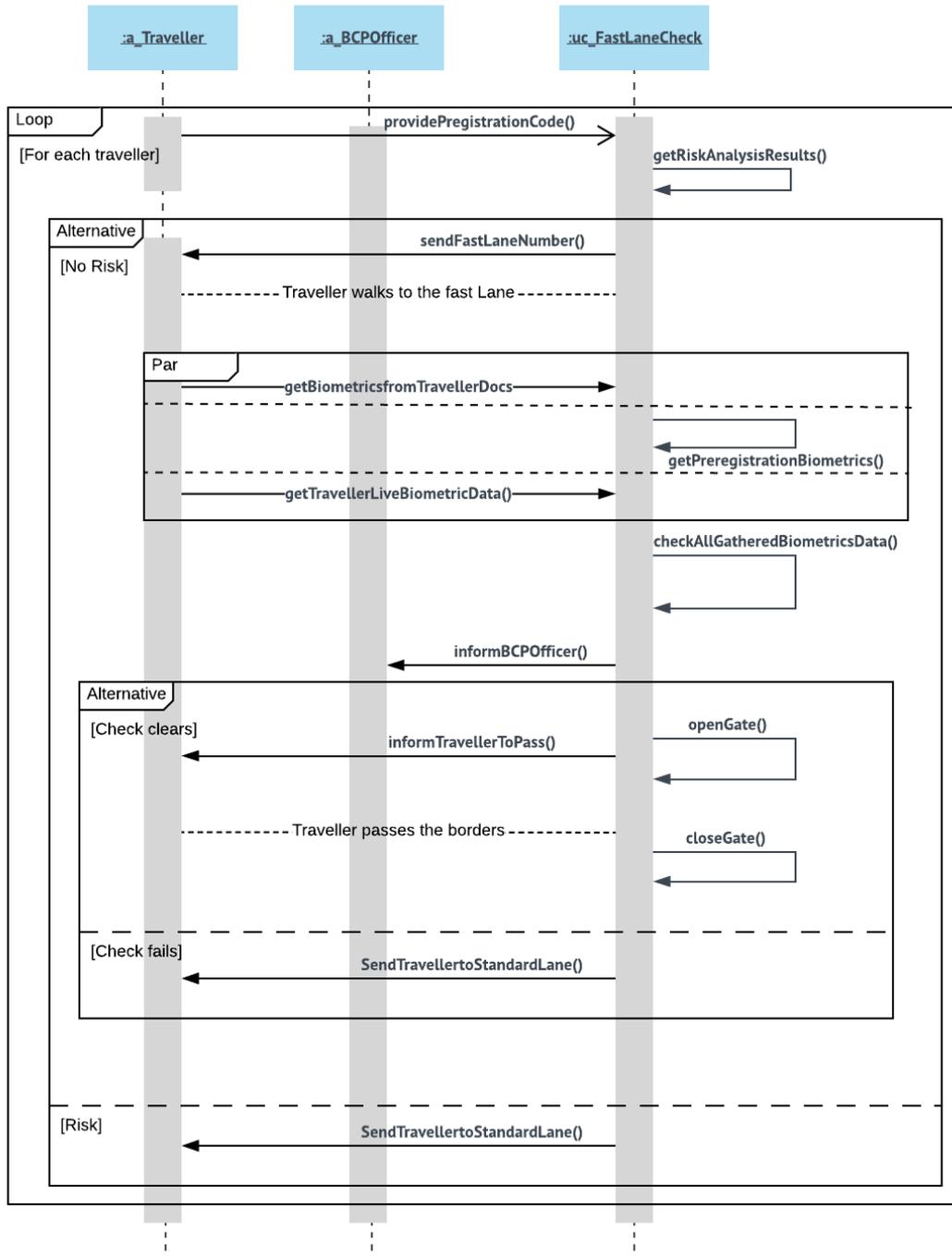


Figure 4 Fast lane check system use case scenarios diagram: Pedestrian Scenarios

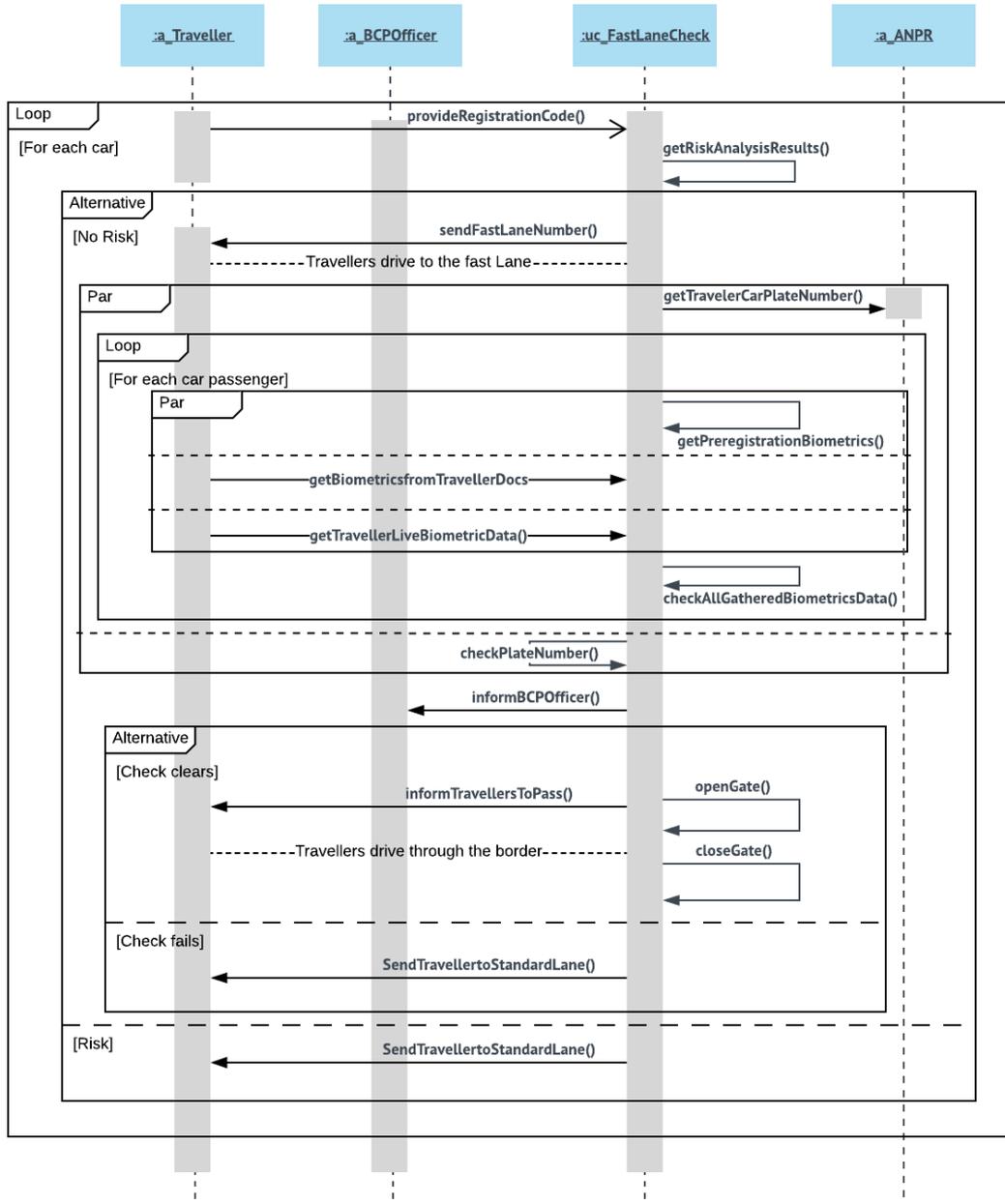


Figure 5 Fast lane check system - use case scenarios diagram: Vehicle Scenarios

6.2.2.1 Scenario SUC2.1: Pedestrian traveller – Successful check

Description: An already preregistered pedestrian traveller arrives at the fast lane. At the fast lane, the traveller provides the requested biometrics (e.g. face photo) and the biometrics included in its e-Identity documents (e.g. e-Passport). The collected biometrics, including the ones filed during the preregistration process, are matched to each other successfully. The BCP officer is informed about the check result (in case she/he decides to override the system’s decision). Then the traveller is informed to proceed with passing he borders; at the same time the system may open and close (after the traveller’s passing) the gates automatically (if applicable).

Precondition: The traveller is already successfully preregistered via the SMILE preregistration system and has received a preregistration code in its mobile phone.

Postcondition: The traveller has passed the borders (upon authorization) via the SMILE fast lane.

6.2.2.2 Scenario SUC2.2: Pedestrian traveller – Risk analysis result above threshold

Description: An already preregistered pedestrian traveller arrives at the fast lane, however the risk analysis result, associated with this traveller is above the alert threshold; as such, after informing the BCP officer, the traveller is routed to the appropriate standard lane to be checked following the standard conventional procedures.

Precondition: The traveller is already successfully preregistered via the SMILE preregistration system and has received a preregistration code in her/his mobile phone.

Postcondition: The traveller has been routed to the standard lane.

6.2.2.3 Scenario SUC2.3: Pedestrian traveller – Biometrics matching failure

Description: An already preregistered pedestrian traveller arrives at the border and goes at the fast lane; the traveller provides the requested biometrics (e.g. face photo) and the biometrics included in its e-Identity documents (e.g. e-Passport). The collected biometrics, including the ones filed during the preregistration process, are matched to each other resulting in a mismatch. The BCP officer is informed about the check and the traveller is routed to the appropriate standard lane to be checked following the standard conventional procedures.

Precondition: The traveller is already successfully preregistered via the SMILE preregistration system and has received a preregistration code in her/his mobile phone.

Postcondition: The traveller has been routed to the standard lane.

6.2.2.4 Scenario SUC2.4: Travellers with a car - Successful check

Description: Already preregistered travellers riding one car arrive at the border. The driver drives to the appropriate fast lane. At the fast lane, the driver and all the co-passengers provide the requested biometrics (e.g. face photo) and the biometrics included in their e-Identity documents (e.g. e-Passport). For each car passenger, the collected biometrics, including the ones filed during the preregistration process, are matched to each other successfully. In parallel to this, the car plate number is matched, successfully, with the one provided during preregistration. The BCP officer is informed about the check result (in case she/he decides to override the system's decision). Then the driver is informed to proceed with passing the borders; at the same time the system may open and close (after the car's passing) the gates automatically (if applicable).

Precondition: The travellers and the car are already successfully preregistered via the SMILE preregistration system and the driver has received a preregistration code in its mobile phone.

Postcondition: The travellers have passed (driving) the borders (upon authorization) via the SMILE fast lane.

6.2.2.5 Scenario SUC2.5: Travellers with a car – Risk analysis result above threshold

Description: Already preregistered travellers riding one car arrive at the border. The driver drives to the appropriate fast lane. The risk analysis result, associated with the provided preregistration code, is above the alert threshold; as such, after informing the BCP officer, the car (with all passengers inside) is routed to the appropriate standard lane where the travellers and the car will be checked following the standard conventional procedures.

Precondition: The travellers and the car are already successfully preregistered via the SMILE preregistration system and driver has received a preregistration code in her/his mobile phone.

Postcondition: The car (with all passengers inside) has been routed to the standard lane.

6.2.2.6 Scenario SUC2.6: Travellers with a car – Biometrics matching failure

Description: Already preregistered travellers riding one car arrive at the border. The driver drives to the appropriate fast lane. At the fast lane, the driver and all the co-passengers provide the requested biometrics (e.g. face photo) and the biometrics included in their e-Identity documents (e.g. e-Passport). The car plate number is matched, successfully, with the one provided during preregistration. In parallel to this, and for each car passenger, the collected biometrics, including the ones filed during the preregistration process, are matched to each other, but there is a mismatch with one of the passengers. The BCP officer is informed about the check result, and then the car (with all passengers inside) is routed to the appropriate standard lane where the travellers and the car will be checked following the standard conventional procedures.

Precondition: The travellers and the car are already successfully preregistered via the SMILE preregistration system and the driver has received a preregistration code in her/his mobile phone.

Postcondition: The car and travellers have been routed to the standard lane.

6.3 System interfaces

In this section, the interfaces of the SMILE system with the main external entities, namely the SMILE end-users and the external databases are briefly discussed.

6.3.1 SMILE end users

SMILE end users are the BCP officers and the travellers. For the former the main interaction with the SMILE system will be via the verification tablet (towards performing the check operations) whereas for the latter via their PC, laptop, mobile device or an enrolment kiosk (towards performing the preregistration process).

6.3.1.1 Preregistration system

The preregistration system will have two user interfaces for normal users and BCP officers. The interface for normal users is a responsive web application (webapp), which allows the user to conduct preregistration and retrieve their preregistration records by using laptops or mobile devices. The interface for BCP officers allows them to check data compliance between user-input data and the eIDAS returned records. As far as it concerns the communication interface, a HTTPS RESTful interface that allows the travellers to securely submit their preregistration data will be utilized.

6.3.1.1.1 Preregistration data

SMILE intends to follow ETIAS (European Travel Information and Authorisation System) proposal [5], Article 15, for defining the traveller's data that will be collected during the preregistration phase. Acknowledging that ETIAS is for TCNs (Third Country Nationals) a subset of these data will be utilised for the travellers that have the right to move freely under Union law (e.g. EU citizens).

SN	Data	
(a)	surname (family name), first name(s) (given name(s)), surname at birth; date of birth, place of birth, country of birth, sex, current nationality, first name(s) of the parents of the applicant	
(b)	other names (alias(es), artistic name(s), usual name(s))	
(c)	other nationalities (if any)	
(d)	type, number and country of issuance of the travel document	
(e)	the date of expiry of the validity of the travel document	
(f)	the applicant's home address or, if not available, his or her city and country of residence	
(g)	e-mail address, phone number	
(h)	education (level and field)	
(i)	current occupation	
(j)	Member State of first intended entry	
(k)	for minors, surname and first name(s) of the applicant's parental authority or legal guardian	
(l)	where he or she claims the status of family member referred to in Article 2(1)(c):	their status of family member
		the surname, first name(s), date of birth, place of birth, country of birth, current nationality, home address, e-mail address and phone number of the

		family member with whom the applicant has family ties
		their family ties with that family member in accordance with Article 2(2) of Directive 2004/38/EC
(m)	in the case of applications filled in by a person other than the applicant, the surname, first name(s), name of firm, organization if applicable, e-mail address, mailing address, phone number; relationship to the applicant and an electronically signed representative declaration.	

Table 7 ETIAS application data

In addition to this, and only for TCNs that are required to have a Schengen VISA, the Visa sticker number should be entered. As far as it concerns biometrics, SMILE will enable the BCP officer to scan the face, the fingerprints and the iris of the traveller. Furthermore, in case a vehicle will be used for passing the borders, the license plate number along with the country that the car is registered, and the number of passengers must be entered. Finally, SMILE will scan and extract information from e-passports (following ICAO 9393-1 [6] guidelines) and visa stickers.

6.3.1.2 Verification Tablet

The verification tablet will perform identity verification of the travellers when required. The tablet will provide a graphical interface, accessible via its touch screen supporting a set of functionalities for capturing biometric from travellers and for reading identity documents. As far as it concerns the hardware interfaces the tablet will embed the following sensors:

- Optical fingerprint sensor for fingerprints capture and recognition
- IR camera for iris capture
- Camera for face capture and ID document reading (MRZ)
- Swipe reader for MRZ reading
- NFC for ID document chip reading

6.3.1.3 Soft face biometrics module

An API will be developed in order to extract soft biometric features from the travellers (The type of biometrics to capture will be described in D3.1). The feature extraction process will be initiated from a handheld device (preregistration App, border officers' tablets), and will be performed either locally on the device or remotely through secure cloud services, with the extracted biometric features being saved on the SMILE's cloud databases.

6.3.1.4 Biometric module

An API will be developed for the biometrics module. The SMILE verification Tablet will have the capability of capturing three biometric modalities, namely fingerprint, face and iris. The processing of those biometric data could be done either in the device itself or in the SMILE private cloud. Therefore, an interface will be developed to exchange data (processing results, templates or biometric data themselves) between the hardware device and the cloud service.

6.3.2 External databases

Towards being compliant with the EU regulations regarding border checks, SMILE has to connect with the external databases VIS and SIS (II). The former is used to exchange visa data to all Schengen states whereas the latter for finding out if any alert has been issued for a

person or object. In addition to these, other databases such as the EURODAC (EU fingerprints database), ECRIS (European database of criminal records) and EIS (Europol's central information system) may be used during the border checks. Besides the EU databases, each participating BCP utilises several national databases (e.g. National VIS, National SIS systems, other proprietary databases) that SMILE system may use towards validating travellers' data and performing its risk analysis. All the prementioned databases are described in SMILE's deliverable D4.1.

For each of the used databases, SMILE has to implement the associated API endpoints towards being able to access the stored information. Because of the sensitive nature of the stored information, during the testing and pilot phases, no connection with these DBs will take place; instead replicants (in structure) of these databases hosting emulated data will be utilised.

6.4 System requirements

6.4.1 Functional Requirements

Title: SysReq-F-1: Minimum time between preregistration and border passing.
Code: SysReq-F-1
Description: The system shall not allow the pre-registration of travellers if the difference of the preregistration time and the declared time for passing the specific BCP is less than two hours.
Requirement Type: Functional
Source: UserReq 34
Status: In Progress
Implementing Components: SMILE Preregistration system, SMILE Travellers Mobile App, SMILE Travelers Web UI

Title: SysReq-F-2: Maximum time between preregistration and border passing.
Code: SysReq-F-2
Description: The system shall not allow the pre-registration of travellers if the difference of the preregistration time and the declared time for passing the specific BCP is more than 60 days.
Requirement Type: Functional
Source: UserReq 34
Status: In Progress
Implementing Components: SMILE Preregistration system, SMILE Travellers Mobile App, SMILE Travelers Web UI

Title: SysReq-F-3: Traveller groups preregistration
Code: SysReq-F-3
Description: The system shall be able to preregister traveller groups
Requirement Type: Functional
Source: UserReq 36
Status: In Progress
Implementing Components: SMILE Preregistration system, SMILE Travellers Mobile App, SMILE Travelers Web UI

Title: SysReq-F-4: Traveller preregistration
Code: SysReq-F-4
Description: The system shall be able to preregister individual travellers
Requirement Type: Functional
Source: UserReq 36
Status: In Progress
Implementing Components: SMILE Preregistration system, SMILE Travellers Mobile App, SMILE Travelers Web UI

Title: SysReq-F-5: Traveller enrolment
Code: SysReq-F-5
Description: The system shall allow the traveller to enrol only once.
Requirement Type: Functional
Source: UserReq 37
Status: In Progress
Implementing Components: SMILE Preregistration system, SMILE Travellers Mobile App, SMILE Travelers Web UI

Title: SysReq-F-6: Preregistration feedback
Code: SysReq-F-6
Description: The system shall provide feedback to the travellers regarding the preregistration process outcome.
Requirement Type: Functional
Source: UserReq 41
Status: Done
Implementing Components: SMILE Preregistration system, SMILE Travellers Mobile App, SMILE Travelers Web UI

Title: SysReq-F-7: Disallow preregistration using VPN
Code: SysReq-F-7
Description: The system should not allow the travellers to pre-register using VPNs
Requirement Type: Functional
Source: UserReq 44
Status: To Do
Implementing Components: SMILE Preregistration system, SMILE Travellers Mobile App, SMILE Travelers Web UI

Title: SysReq-F-8: Extract biometric information from travel documents
Code: SysReq-F-8

Description: The system shall extract the biometric information from the travel documents. This functionality shall provide both to travellers (during the preregistration phase) and the BCP officers (during the verification phase).

Requirement Type: Functional

Source: UserReq 38, UserReq 35

Status: In Progress

Implementing Components: Verification tablet, SMILE Travellers Mobile App

Title: SysReq-F-9: Provide information for personal data usage

Code: SysReq-F-9

Description: The system shall provide appropriate information about the personal data collection and the purpose of the data processing.

Requirement Type: Functional

Source: UserReq 52

Status: In Progress

Implementing Components: SMILE Preregistration system, SMILE Travellers Mobile App, SMILE Travelers Web UI

Title: SysReq-F-10: Traveller consent for personal data collection and processing

Code: SysReq-F-10

Description: The system shall enable the travellers to provide their consent for the collection and further processing of their personal data.

Requirement Type: Functional

Source: UserReq 53

Status: In Progress

Implementing Components: SMILE Preregistration system, SMILE Travellers Mobile App, SMILE Travelers Web UI

Title: SysReq-F-11: Configuration of privacy settings

Code: SysReq-F-11

Description: The system shall provide the necessary mechanisms to the travellers for setting their privacy preferences

Requirement Type: Functional

Source: UserReq 54

Status: In Progress

Implementing Components: SMILE Preregistration system, SMILE Travellers Mobile App, SMILE Travelers Web UI, SMILE Homomorphic Encryption Engine

Title: SysReq-F-12: Risk analysis

Code: SysReq-F-12

Description: The system shall perform a risk analysis for each preregistered traveller (based on the preregistration data, the data contained in the relevant external EU databases and any system generated relevant data)
Requirement Type: Functional
Source: UserReq 39
Status: In Progress
Implementing Components: SMILE Backend System, SMILE Preregistration system , SMILE Risk Analysis module

Title: SysReq-F-13: Risk analysis results
Code: SysReq-F-13
Description: The system shall provide to any legit user the risk analysis results.
Requirement Type: Functional
Source: UserReq 39
Status: In Progress
Implementing Components: SMILE Backend System, SMILE Preregistration system , SMILE Risk Analysis module, SMILE Admin Web UI

Title: SysReq-F-14: Verification of traveller face
Code: SysReq-F-14
Description: The system shall check if the traveller's face photo (acquired during the verification process) matches the one stored in the travel document's chip and the one submitted during the preregistration phase.
Requirement Type: Functional
Source: UserReq 40
Status: In Progress
Implementing Components: SMILE Backend System, Verification tablet, SMILE Homomorphic Encryption Engine

Title: SysReq-F-15: Risk analysis alerts
Code: SysReq-F-15
Description: The system shall notify the Risk analyst officer for all the produced alerts.
Requirement Type: Functional
Source: UserReq 43
Status: To Do
Implementing Components: SMILE Risk Analysis module

Title: SysReq-F-16: Risk analysis manual mode
Code: SysReq-F-16
Description: The system shall allow the risk analyst officers to make manual checks
Requirement Type: Functional
Source: UserReq 45

Status: In Progress

Implementing Components: SMILE Risk Analysis module
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Title: SysReq-F-17: Risk analysis send alerts manually

Code: SysReq-F-17

Description: The system shall allow the risk analyst officers to send alerts manually.

Requirement Type: Functional

Source: UserReq 46

Status: In Progress

Implementing Components: SMILE Risk Analysis module
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Title: SysReq-F-18: Verification using biometrics
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Code: SysReq-F-18

Description: The system shall perform face recognition and biometrics checks.
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Requirement Type: Functional

Source: UserReq 47

Status: In Progress

Implementing Components: Verification tablet, SMILE Homomorphic Encryption Engine
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Title: SysReq-F-19: Verification - Capture iris
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Code: SysReq-F-19

Description: The system shall capture the iris of the traveller.

Requirement Type: Functional

Source: UserReq 48

Status: In Progress

Implementing Components: Verification tablet, SMILE Homomorphic Encryption Engine
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Title: SysReq-F-20: Verification - Capture of soft biometrics
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Code: SysReq-F-20

Description: The system shall capture the traveller's soft biometrics.

Requirement Type: Functional

Source: UserReq 49

Status: In Progress

Implementing Components: Verification tablet, SMILE Homomorphic Encryption Engine
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Title: SysReq-F-21: Verification of traveller
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Code: SysReq-F-21

Description: The system shall check if all the data (biometric or other) collected from the traveller during the verification process match the ones stored in the travel document's chip and the ones submitted during the
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preregistration	phase.
Requirement Type: Functional	
Source: UserReq 40, UserReq 51	
Status: In Progress	
Implementing Components: Verification tablet, SMILE Homomorphic Encryption Engine	

Title: SysReq-F-22: Scalable trust level of cross-checks
Code: SysReq-F-22
Description: The system shall provide a scalable trust level of cross-checks.
Requirement Type: Functional
Source: UserReq 51
Status: In Progress
Implementing Components: Verification tablet, SMILE Risk analysis module

Title: SysReq-F-23: Scalable trust level of cross-checks configuration
Code: SysReq-F-23
Description: The system shall provide a way to configure the trust level of cross-checks according to the end users (BCP) KPIs.
Requirement Type: Functional
Source: UserReq 51
Status: In Progress
Implementing Components: Verification tablet, SMILE Risk analysis module

Title: SysReq-F-26: End user authentication
Code: SysReq-F-26
Description: The system shall authenticate every end user.
Requirement Type: Functional
Source: UserReq 16
Status: In Progress
Implementing Components: SMILE Backend System, SMILE Preregistration system, SMILE GW, PUF, Verification tablet, SMILE Travellers Mobile App, SMILE Travelers Web UI, SMILE Admin Web UI, SMILE Homomorphic Encryption Engine

Title: SysReq-F-27: Preregistration - Vehicle plate number
Code: SysReq-F-27
Description: The system shall prompt the end user for inserting their travelling vehicle plate number.
Requirement Type: Functional
Source:
Status: Done
Implementing Components: SMILE Preregistration system, SMILE Travellers Mobile App, SMILE Travelers Web UI

Title: SysReq-F-28: Preregistration - Number of travellers
Code: SysReq-F-28
Description: The system shall prompt the end user for the number of travellers.
Requirement Type: Functional
Source:
Status: Done
Implementing Components: SMILE Preregistration system, SMILE Travellers Mobile App, SMILE Travelers Web UI

Title: SysReq-F-29: Preregistration - Traveller data storage
Code: SysReq-F-29
Description: The system shall save the submitted preregistration data of the traveller.
Requirement Type: Functional
Source:
Status: Done
Implementing Components: SMILE Backend System, SMILE Preregistration system

Title: SysReq-F-30: Preregistration code
Code: SysReq-F-30
Description: In case of a successful preregistration, the system shall include in the notification message a unique preregistration code
Requirement Type: Functional
Source:
Status: To Do
Implementing Components: SMILE Preregistration system

Title: SysReq-F-31: Preregistration data validation
Code: SysReq-F-31
Description: The system shall validate the submitted preregistration data.
Requirement Type: Functional
Source:
Status: In Progress
Implementing Components: SMILE Preregistration system, SMILE Travellers Mobile App, SMILE Travelers Web UI, SMILE Homomorphic Encryption Engine

Title: SysReq-F-32: Preregistration - Feedback to fix erroneous input
Code: SysReq-F-32

Description: In case of an unsuccessful preregistration, caused from erroneous input (e.g. misspelling, wrong image format), the system should include in the notification message a description of the errors and how to fix them.
Requirement Type: Functional
Source:
Status: To Do
Implementing Components: SMILE Preregistration system, SMILE Travellers Mobile App, SMILE Travelers Web UI

Title: SysReq-F-33: Preregistration data verification
Code: SysReq-F-33
Description: The system shall connect to the external EU (e.g. VIS, SIS II, etc) and National databases (if applicable) towards verifying the submitted traveller's data.
Requirement Type: Functional
Source:
Status: To Do
Implementing Components: SMILE Preregistration system, SMILE Travellers Mobile App, SMILE Travelers Web UI

Title: SysReq-F-34: Travelling document acceptance in declared countries
Code: SysReq-F-34
Description: The system shall warn the passenger, during the preregistration phase, if the entry, transit, and exit declared countries are accepting the provided travelling documents.
Requirement Type: Functional
Source: BCP officers (End users)
Status: To Do
Implementing Components: SMILE Preregistration system, SMILE Travellers Mobile App, SMILE Travelers Web UI

Title: SysReq-F-35: Prefetch travels data locally at BCP
Code: SysReq-F-35
Description: The system shall be able to prefetch travels data locally to compensate for a lost Internet connection.
Requirement Type: Functional
Source: EES — WG REPORT
Status: In Progress
Implementing Components: SMILE Backend System, SMILE GW, Verification tablet, SMILE Homomorphic Encryption Engine

Title: SysReq-F-36: Generation of reports
Code: SysReq-F-36

Description: The system shall create, deploy, and manage, statistical reports about travellers' entries and exits as well as overstayers in case of TCNs'.
Requirement Type: Functional
Source:
Status: To Do
Implementing Components: SMILE report component, SMILE Web Admin UI

Title: SysReq-F-37: Log entry and exit of a traveller
Code: SysReq-F-37
Description: The system shall log the entry and exit of the travellers which should include the person's data, the traveller document data (MRZ) and the visa related data (if applicable).
Requirement Type: Functional
Source:
Status: To Do
Implementing Components: SMILE Backend System

6.4.2 Non-Functional Requirements

6.4.2.1 Availability requirements

Title: SysReq-NF-AVB-1: Data availability
Code: SysReq-NF-AVB-1
Description: The system shall provide data on request to every authorised end user.
Requirement Type: Non FunctionalAvailability
Source: UserReq 67
Status: Done
Implementing Components: SMILE Backend System, SMILE Preregistration system, SMILE GW, Verification tablet, SMILE Travellers Mobile App, SMILE Travelers Web UI, SMILE Admin Web UI

Title: SysReq-NF-AVB-2: Electronic access to system
Code: SysReq-NF-AVB-2
Description: The system shall be available to its end users via electronic means.
Requirement Type: Non FunctionalAvailability
Source: UserReq 68
Status: Done
Implementing Components: SMILE Travellers Mobile App, SMILE Travelers Web UI , SMILE Admin Web UI, Tablet's Verification App

Title: SysReq-NF-AVB-3: System availability via the Internet - Travellers
Code: SysReq-NF-AVB-3
Description: The system shall be available to the travellers via the Internet.
Requirement Type: Non FunctionalAvailability

Source: UserReq 69
Status: Done
Implementing Components: SMILE Backend System, SMILE Preregistration system

Title: SysReq-NF-AVB-4: System availability
Code: SysReq-NF-AVB-4
Description: The system shall be available to its end users 24/7.
Requirement Type: Non FunctionalAvailability
Source: UserReq 70
Status: In Progress
Implementing Components: SMILE Backend System, SMILE Preregistration system, , SMILE GW, PUF, Verification tablet

6.4.2.2 Compatibility Requirements

Title: SysReq-NF-CMP-1: Preregistration system - Device compatibility
Code: SysReq-NF-CMP-1
Description: The preregistration system shall be able to be used from smart phones, tablets, laptops and Desktop PCs.
Requirement Type: Non FunctionalCompatibility
Source: UserReq 21
Status: Done
Implementing Components: SMILE Travellers Mobile App, SMILE Travelers Web UI

Title: SysReq-NF-CMP-2: Preregistration system - Browser compatibility
Code: SysReq-NF-CMP-2
Description: The preregistration system shall be able to be used from all the mainstream Internet browsers.
Requirement Type: Non FunctionalCompatibility
Source: UserReq 22
Status: In Progress
Implementing Components: SMILE Preregistration system, SMILE Travelers Web UI

Title: SysReq-NF-CMP-3: Preregistration system - Data compatibility
Code: SysReq-NF-CMP-3
Description: The preregistration traveller data shall be compatible with the data used in EU external databases (ETIAS, EES, SIS, VIS, EIS, ECRIS).
Requirement Type: Non FunctionalCompatibility
Source: UserReq 23
Status: In Progress
Implementing Components: SMILE Preregistration system, SMILE Travellers Mobile App, SMILE Travelers Web UI

Title: SysReq-NF-CMP-4: System compatibility - External Databases
Code: SysReq-NF-CMP-4
Description: The system shall be compatible with the EU external databases (ETIAS, EES, SIS, VIS, EIS, ECRIS).
Requirement Type: Non FunctionalCompatibility
Source: UserReq 26
Status: In Progress
Implementing Components: SMILE Risk analysis, SMILE Backend system

6.4.2.3 Connectivity Requirements

Title: SysReq-NF-CON-1: Connectivity with the External EU databases
Code: SysReq-NF-CON-1
Description: The system shall have connection with the external EU and National databases (e.g. VIS, SIS, EES) that are needed for validating the traveller's documents and data.
Requirement Type: Non FunctionalConnectivity
Source: UserReq 31
Status: To Do
Implementing Components: SMILE Backend system

Title: SysReq-NF-CON-2: SMILE interconnection with BCP Control and Command room
Code: SysReq-NF-CON-2
Description: The system shall be interconnected to the BCP's legacy systems such as the Command and control room, the surveillance infrastructures, and the internal databases.
Requirement Type: Non FunctionalConnectivity
Source: UserReq 29, UserReq 30
Status: To Do
Implementing Components: SMILE Risk Analysis module

Title: SysReq-NF-CON-3: Travellers 3G/4G connectivity
Code: SysReq-NF-CON-3
Description: The system shall support the connection of travellers via 3G/4G technologies.
Requirement Type: Non FunctionalConnectivity
Source: UserReq 28
Status: Done
Implementing Components: SMILE Travellers Mobile App

6.4.2.4 Operability Requirements

Title: SysReq-NF-OPR-1: System backup
Code: SysReq-NF-OPR-1
Description: The system shall have an efficient data backup system.
Requirement Type: Non FunctionalOperability
Source:
Status: In Progress
Implementing Components: SMILE Backend System, SMILE Preregistration system

Title: SysReq-NF-OPR-2: Battery powered
Code: SysReq-NF-OPR-2
Description: The handheld verification device shall be battery powered.
Requirement Type: Non FunctionalOperability
Source: EES — WG REPORT
Status: Done
Implementing Components: Verification tablet

Title: SysReq-NF-OPR-2.1: Battery capacity
Code: SysReq-NF-OPR-2.1
Description: The batter of the verification tablet will have a high capacity for sustaining about 8-12 hours operability.
Requirement Type: Non FunctionalOperability
Source: EES — WG REPORT
Status: To Do
Implementing Components:

Title: SysReq-NF-OPR-2.2: Removable batteries
Code: SysReq-NF-OPR-2.2
Description: The verification tablet should have removable/swappable batteries and an additional set of batteries per tablet.
Requirement Type: Non FunctionalOperability
Source: EES — WG REPORT
Status: To Do
Implementing Components:

Title: SysReq-NF-OPR-2.3: Fast charging
Code: SysReq-NF-OPR-2.3
Description: The battery of the verification tablet shall be fast charging.

Requirement Type: Non FunctionalOperability
Source: EES — WG REPORT
Status: To Do
Implementing Components:

Title: SysReq-NF-OPR-3: Cameras for facial recognition
Code: SysReq-NF-OPR-3
Description: The system shall utilise an embedded camera used for dedicated flashes to allow the capture of colour facial images with a nominal resolution (in portrait mode) of minimum of 600 pixels by 800 pixels and maximum of 1200pixels by 1600 pixels with a distance between eyes of minimum 120 pixels and in accordance with the requirements of ISO/IEC 19794-5:2011 Frontal image type
Requirement Type: Non FunctionalOperability
Source: EES — WG REPORT
Status: In Progress
Implementing Components: Verification tablet

Title: SysReq-NF-OPR-4: Fingerprint scanner
Code: SysReq-NF-OPR-4
Description: The system shall have an embedded fingerprint scanner allowing the capture 4 fingerprints with a nominal resolution of either 500 or 1000 ppi (with an acceptable deviation of +/- 10 ppi) with 256 grey levels and in accordance with the ANSI/NIST-ITL 1-2011 Update 2015 standard (or newer version)
Requirement Type: Non FunctionalOperability
Source: EES — WG REPORT
Status: In Progress
Implementing Components: Verification tablet

Title: SysReq-NF-OPR-5: Document reader
Code: SysReq-NF-OPR-5
Description: The system's verification device shall have an error proof document reader (optical and NFC).
Requirement Type: Non FunctionalOperability
Source: EES — WG REPORT
Status: In Progress
Implementing Components: Verification tablet

Title: SysReq-NF-OPR-6: Lightening feature
Code: SysReq-NF-OPR-6
Description: The system's verification device shall have a lightening feature
Requirement Type: Non FunctionalOperability

Source: EES — WG REPORT
Status: To Do
Implementing Components: Verification tablet

Title: SysReq-NF-OPR-7: GPS on verification devices
Code: SysReq-NF-OPR-7
Description: The system's verification device shall have a GPS to record the exact position of the border check.
Requirement Type: Non FunctionalOperability
Source: EES — WG REPORT
Status: To Do
Implementing Components: Verification tablet

6.4.2.5 Performance Requirements

Title: SysReq-NF-PRF-1: Collection of biometrics during preregistration
Code: SysReq-NF-PRF-1
Description: The system shall be able to extract the biometric information in timely fashion through the pre-registration app
Requirement Type: Non FunctionalPerformance
Source: UserReq 55
Status: Done
Implementing Components: SMILE Travellers Mobile App

Title: SysReq-NF-PRF-2: Collection of traveller's biometrics during verification phase
Code: SysReq-NF-PRF-2
Description: The system shall enable for the quick, error prone and user-friendly retrieval of the traveller's biometrics during the verification phase. The traveller's interaction with the sensors/devices required to retrieve the biometric data shall be no more than 30 seconds.
Requirement Type: Non FunctionalPerformance
Source: UserReq 60
Status: In Progress
Implementing Components: Verification tablet, SMILE Homomorphic Encryption Engine

Title: SysReq-NF-PRF-3: Verification of traveller's biometrics from the system
Code: SysReq-NF-PRF-3
Description: The system shall perform the verification of the collected biometrics in less than 20 seconds.
Requirement Type: Non FunctionalPerformance

Source: UserReq 62, UserReq 63, UserReq 65
Status: In Progress
Implementing Components: Verification tablet, SMILE Homomorphic Encryption Engine

Title: SysReq-NF-PRF-4: Configuration of the face recognition module thresholds
Code: SysReq-NF-PRF-4
Description: The system shall enable the authorised users to configure the minimum threshold for the face recognition module (e.g. >80%).
Requirement Type: Non FunctionalPerformance
Source: UserReq 66
Status: In Progress
Implementing Components: Verification tablet

Title: SysReq-NF-PRF-5: Risk analysis time limit
Code: SysReq-NF-PRF-5
Description: The system shall perform the risk analysis in less than 2 hours.
Requirement Type: Non FunctionalPerformance
Source: UserReq 59
Status: To Do
Implementing Components: SMILE Risk Analysis module

Title: SysReq-NF-PRF-6: System performance in peak situations
Code: SysReq-NF-PRF-6
Description: The system should be able to cope with the sudden increase in load as far as it concerns the preregistration and verification activities.
Requirement Type: Non FunctionalPerformance
Source:
Status: To Do
Implementing Components: SMILE Backend System, SMILE Preregistration system, SMILE GW, PUF, Verification tablet

6.4.2.6 Privacy Requirements

Title: SysReq-NF-PRV-1: System compliance with data protection regulations
Code: SysReq-NF-PRV-1
Description: The system shall collect, process, store and share the traveller's personal data in compliance to Regulation (EU) 2016/679 (GDPR) and Directive (EU) 2016/680.
Requirement Type: Non FunctionalPrivacy
Source: UserReq 03

Status: In Progress
Implementing Components: SMILE Backend System, SMILE Preregistration system, SMILE GW, Verification tablet

Title: SysReq-NF-PRV-2: Personal data storage period
Code: SysReq-NF-PRV-2
Description: The system shall store the data no more than the needed duration.
Requirement Type: Non FunctionalPrivacy
Source: UserReq 05
Status: In Progress
Implementing Components: SMILE Backend System, SMILE Preregistration system, SMILE GW, Verification tablet

Title: SysReq-NF-PRV-3: Personal data transmission
Code: SysReq-NF-PRV-3
Description: The system shall encrypt the personal data prior to their transmission.
Requirement Type: Non FunctionalPrivacy
Source: UserReq 01
Status: In Progress
Implementing Components: SMILE Backend System, SMILE Preregistration system, SMILE GW, Verification tablet, SMILE Travellers Mobile App, SMILE Travelers Web UI, SMILE Homomorphic Encryption Engine

Title: SysReq-NF-PRV-4: Personal data storage
Code: SysReq-NF-PRV-4
Description: The system shall encrypt the personal data prior to their storage.
Requirement Type: Non FunctionalPrivacy
Source: UserReq 02
Status: In Progress
Implementing Components: SMILE Backend System, SMILE Preregistration system, SMILE GW, Verification tablet, SMILE Travellers Mobile App, SMILE Homomorphic Encryption Engine

Title: SysReq-NF-PRV-5: Personal data deletion
Code: SysReq-NF-PRV-5
Description: The system shall delete the personal data when no more needed or when the data retention time is expired.
Requirement Type: Non FunctionalPrivacy
Source: UserReq 07
Status: In Progress
Implementing Components: SMILE Backend System, SMILE Preregistration system, SMILE GW, Verification tablet, SMILE Travellers Mobile App

Title: SysReq-NF-PRV-6: Personal data exploitation
Code: SysReq-NF-PRV-6
Description: The system shall not allow the use of the personal data outside of the SMILE context.
Requirement Type: Non FunctionalPrivacy
Source: UserReq 08
Status: Done
Implementing Components: SMILE Backend System, SMILE Preregistration system, SMILE GW, Verification tablet, SMILE Travellers Mobile App, SMILE Travelers Web UI

Title: SysReq-NF-PRV-7: Personal data anonymization before used in reports
Code: SysReq-NF-PRV-7
Description: The system shall anonymize any personal data destined to be used for reporting purposes.
Requirement Type: Non FunctionalPrivacy
Source: UserReq 06
Status: Done
Implementing Components: SMILE Backend System, SMILE Reporting component

6.4.2.7 Security Requirements

Title: SysReq-NF-SEC-1: Confidential data validation
Code: SysReq-NF-SEC-1
Description: The system shall hash and sign all confidential data towards being able to validate them.
Requirement Type: Non FunctionalSecurity
Source: UserReq 09
Status: To Do
Implementing Components: SMILE Backend System, SMILE Preregistration system

Title: SysReq-NF-SEC-2: Security of communication channels
Code: SysReq-NF-SEC-2
Description: The system shall provide encrypted communication channels for the data exchange between the end users and the system itself.
Requirement Type: Non FunctionalSecurity
Source: UserReq 10
Status: Done
Implementing Components: SMILE Backend System, SMILE Preregistration system, SMILE GW, PUF, Verification tablet, SMILE Travellers Mobile App, SMILE Travelers Web UI, SMILE Admin Web UI

Title: SysReq-NF-SEC-3: User login log
Code: SysReq-NF-SEC-3
Description: The system shall log every end user login attempt in the SMILE system.
Requirement Type: Non FunctionalSecurity
Source: UserReq 13
Status: In Progress
Implementing Components: SMILE Backend System, SMILE Preregistration system, SMILE GW, Verification tablet

Title: SysReq-NF-SEC-4: End user authentication identifier
Code: SysReq-NF-SEC-4
Description: The system shall provide to each end user a unique authentication identifier
Requirement Type: Non FunctionalSecurity
Source: UserReq 14
Status: Done
Implementing Components: SMILE Backend System, SMILE Preregistration system, SMILE GW, PUF, Verification tablet,

Title: SysReq-NF-SEC-5: Prohibit different profiles for same biometric traits
Code: SysReq-NF-SEC-5
Description: The system shall not allow the creation of different profiles for the same biometric traits (e.g. different profile for a border officer as an officer and as a traveller)
Requirement Type: Non FunctionalSecurity
Source: UserReq 73
Status: Done
Implementing Components: SMILE Backend System, SMILE Preregistration system

Title: SysReq-NF-SEC-6: Access to preregistration data
Code: SysReq-NF-SEC-6
Description: The system shall prohibit any unauthorized access to the stored preregistration data.
Requirement Type: Non FunctionalSecurity
Source:
Status: Done
Implementing Components: SMILE Backend System, SMILE Preregistration system

Title: SysReq-NF-SEC-7: Check and restrict data input in the system
Code: SysReq-NF-SEC-7
Description: The system shall restrict and check the data that are used as input in the system.
Requirement Type: Non FunctionalSecurity
Source:

Status: In Progress
Implementing Components: SMILE Backend System, SMILE Preregistration system, Verification tablet, SMILE Travellers Mobile App, SMILE Travelers Web UI, SMILE Admin Web UI, PUF, SMILE GW

Title: SysReq-NF-SEC-8: protection from radio frequencies perturbation
Code: SysReq-NF-SEC-8
Description: The system's verification device shall be protected against radio frequencies perturbations.
Requirement Type: Non FunctionalSecurity
Source: EES — WG REPORT
Status: To Do
Implementing Components: PUF

Title: SysReq-NF-SEC-9: Access control to system's resources
Code: SysReq-NF-SEC-9
Description: The system shall allow access to the system's resources only to authorized users.
Requirement Type: Non FunctionalSecurity
Source: EES — WG REPORT
Status: Done
Implementing Components: SMILE Backend System, SMILE Preregistration system, SMILE GW, Verification tablet, SMILE Travellers Mobile App, SMILE Travelers Web UI, SMILE Admin Web UI

Title: SysReq-NF-SEC-10: polarised screen
Code: SysReq-NF-SEC-10
Description: The system's verification device shall use a polarised screen to prevent readings by more persons than intended.
Requirement Type: Non FunctionalSecurity
Source: EES — WG REPORT
Status: To Do
Implementing Components: Verification tablet

Title: SysReq-NF-SEC-11: Protection from network attacks
Code: SysReq-NF-SEC-11
Description: The system shall use a firewall for blocking any network traffic that is not used for the SMILE purposes.
Requirement Type: Functional
Source:
Status: To Do
Implementing Components: SMILE Backend System, SMILE Preregistration system, SMILE GW, Verification tablet

6.4.2.8 Usability Requirements

Title: SysReq-NF-USA-1: Preregistration - User hints
Code: SysReq-NF-USA-1
Description: The system should provide hints to the user during the preregistration process.
Requirement Type: Non FunctionalUsability
Source:
Status: In Progress
Implementing Components: SMILE Travellers Mobile App, SMILE Travelers Web UI

Title: SysReq-NF-USA-3: Preregistration interface
Code: SysReq-NF-USA-3
Description: The system should provide a responsive preregistration interface.
Requirement Type: Non FunctionalUsability
Source:
Status: In Progress
Implementing Components: SMILE Travellers Mobile App, SMILE Travelers Web UI

Title: SysReq-NF-USA-4: Preregistration interface - Accessibility features
Code: SysReq-NF-USA-4
Description: The preregistration system should be able to be used for people with disabilities.
Requirement Type: Non FunctionalUsability
Source:
Status: To Do
Implementing Components: SMILE Travellers Mobile App, SMILE Travelers Web UI

6.5 Requirements summary

So far there is a relevant equilibrium in the number of the collected functional and non-functional requirements. This reflects our deliberate effort to make sure that both the functional and quality properties of the system will be equally documented during this task.

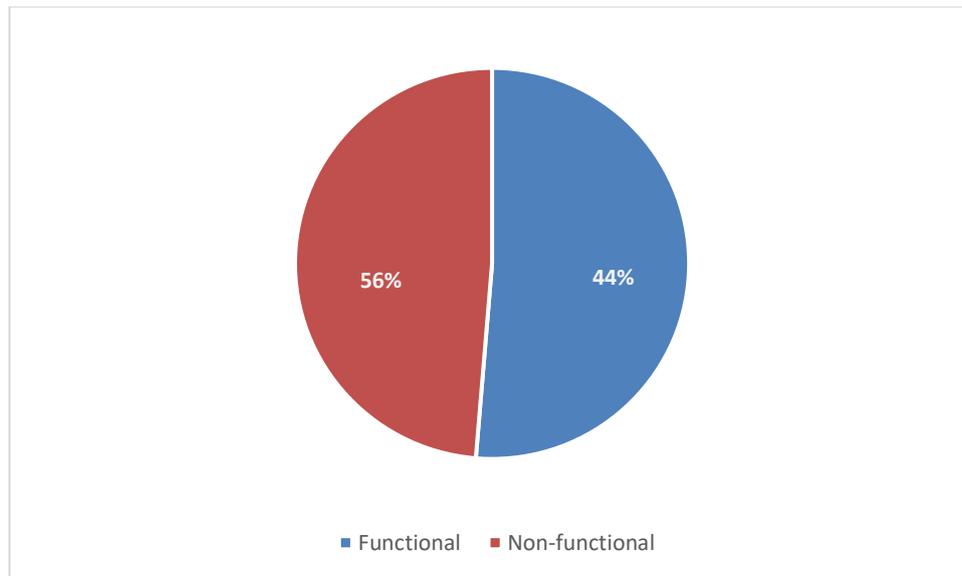


Figure 6 Functional versus Non-functional requirements

As far as it concerns the sources for the derived system requirements the majority came from the users' expressed needs whereas the rest one derived from legal/regulatory directives and from technical requirements expressed from reports produced by EU working group bodies.

Source	Derived system requirements
Legal requirements	23
User requirements	59
EES-WG-REPORT	13

Table 8 Sources for derived system requirements

7. External datasets

The below section summarises the external datasets that will be used for validating and testing the biometrics' extraction and analysis modules of SMILE. A more thorough analysis about these datasets is currently running in the context of T4.2 and will be included in D4.2.

7.1 Public face datasets for soft face biometric features extraction and person matching

In order to develop the soft face biometric feature extraction module, and to evaluate its detection accuracy and robustness in various settings, as well as its person matching and identification potential, the following publicly available face datasets will be utilized:

- **LFW Soft Biometrics Database:** The dataset is based on the "Labelled Faces in the Wild (LFW)" human face dataset, which has been designed as an aid in studying the

problem of unconstrained face recognition. The dataset contains 13233 target face images from 5749 different individuals. For each image the ground truth⁴ for a series of soft and hard biometric facial attributes are provided, namely: gender, age, ethnicity, eyewear, skull form, facial hair, forehead position, eyes position, mouth position and face pose. The dataset is available online at: http://atvs.ii.uam.es/atvs/LFW_SoftBiometrics.html

- **NIST Special Database 32 - Multiple Encounter Dataset (MEDS):** The dataset is provided to assist the FBI and partner organizations to refine tools, techniques, and procedures for face recognition. It includes 1309 headshots from 518 different subjects. For each image the following ground truth annotations are provided: 68 facial landmarks, face pose age, gender, race, weight, height. The dataset is available online at: <https://www.nist.gov/itl/iad/image-group/special-database-32-multiple-encounter-dataset-meds>
- **OUI-Adience Face Image:** The dataset attempts to capture all the variations in appearance, noise, pose, lighting and more, that can be expected of images taken without careful preparation or posing. It includes 25580 face images from 2284 different subjects. For each image the following ground truth annotations are provided: 68 facial landmarks, age and gender. The dataset is available online at: <https://www.openu.ac.il/home/hassner/Adience/data.html>

⁴ The term "ground truth" refers to the accuracy of the training set's classification for supervised learning techniques.

8. Conclusions

In the lifecycle of system engineering, the system requirements are a key element for the implementation of a product that does not only do what its users need but it also does it well. In this direction and following the Volere and IEEE-29148 requirements' frameworks, we produced system use cases using as a basis the users' use cases and stories that were included in D2.2. These (system) use cases were used to describe the interactions of the SMILE platform with the external entities regarding the travellers' preregistration process and the project's envisioned fast lane border checking. Based on the derived interaction diagrams, and on the so far documented user needs and policy/legal constraints, we derived more than 80 functional and quality (non-functional) system requirements that will be used by the development team (along with the architectural descriptions) as the main input towards realising SMILE solution. In front of us awaits a new cycle of discovering any missed requirements, of refining existing ones, and of feeding them again back to the development team, helping them as such to build a system that satisfies the users' needs.

References

- [1] Suzanne Robertson and James Robertson. 2012. Mastering the Requirements Process: Getting Requirements Right (3rd ed.). Addison-Wesley Professional.
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- [3] Bruce Powel Douglass. 2015. Agile Systems Engineering. Morgan Kaufmann Publishers Inc., San Francisco, CA, USA.
- [4] ISO/IEC/IEEE International Standard - Systems and software engineering -- Life cycle processes --Requirements engineering," in ISO/IEC/IEEE 29148:2011(E), vol., no., pp.1-94, Dec. 1 2011
- [5] COM (2016) 731: Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing a European Travel Information and Authorisation System (ETIAS) and amending Regulations (EU) No 515/2014, (EU) 2016/399, (EU) 2016/794 and (EU) 2016/1624
- [6] ISO/IEC 7501-1:2008 (ICAO 9393-1) Identification cards -- Machine readable travel documents -- Part 1: Machine readable passport

Annex I: Indicative list of non-functional requirements

SN	Non-functional Requirement
1	Accessibility
2	Adaptability
3	Auditability
4	Availability
5	Backup
6	Capacity
7	Compatibility
8	Certification
9	Compliance
10	Configuration management
11	Cost
12	Data integrity
13	Data retention
14	Dependency
15	Deployment
16	Development
17	Disaster recovery
18	Documentation
19	Durability
20	Efficiency
21	Environmental protection
22	Escrow
23	Exploitability
24	Extensibility
25	Failure management
26	Fault tolerance
27	Legal and licensing
28	Interoperability
29	Maintainability
30	Management
31	Modifiability
32	Network topology
33	Open source
34	Operability
35	Performance
36	Privacy
37	Portability
38	Quality
39	Readability
40	Reliability
41	Reporting

42	Resilience
43	Resource constraints
44	Response time
45	Reusability
46	Robustness
47	Safety
48	Scalability
49	Security
50	Stability
51	Supportability
52	Testability
53	Throughput
54	Transparency
55	Usability
56	Integrability

Table 9 Indicative list of Non-functional requirements