



CHILD
RESCUE

Collective Awareness Platform for Missing Children Investigation and Rescue

D3.1 - ChildRescue Architecture and Platform Design

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Executive Summary

This deliverable, documents the outcomes of Task 3.1-“Components and APIs Design and Platform Architecture” until [M12]. It is an essential task, as it sets the foundations of WP3, which addresses the design, the implementation and the testing activities of ChildRescue platform. D3.1 revisits and updates the gathered user requirements (T1.1) and combines them with the integrated platform methodology (T1.3) and the methodological foundations on profiling, multi-source analytics and security (WP2), in order to generate the conceptual platform architecture. The functionalities and structure of the individual ChildRescue components are also defined in this context. Prioritisation techniques have been employed on user stories and components, resulting in a multi-level prioritisation and leading to the elaboration of the integration plan that shall guide forthcoming implementation activities. The incorporation of privacy and security measures within the platform is also described in a dedicated section, due to its key role.

The ChildRescue platform architecture, which is presented in this document, is expected to be refined during the project, as the user requirements will be enriched, the APIs and as well as any other technical details will be further defined. Updates pertaining the architectural design, components and APIs will be reported in future deliverables, namely D3.3 and D3.4.

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1 Introduction

1.1 Purpose & Scope

The results of Task 3.1-“Components and APIs Design and Platform Architecture” are documented in the current deliverable. In order for the ChildRescue solution to be defined and for the platform development to begin, the conceptual architecture had to be designed. Following a combination of waterfall and agile approaches, the presented architecture will be further refined throughout the whole project, and the whole progress will be documented in the supporting documentation of the two platform releases (D3.3 and D3.4).

Within the scope of this deliverable, a requirement engineering process was required, for the accumulated user requirements and stories of D1.1 to reflect all knowledge attained thus far, regarding the users’ expectations and needs, and lead to designing a truly valuable system. Along with the high-level and technical views of system architecture, we zoomed in to the individual components of the architecture. An overview of their functionalities and inner structure is provided, as a first approach to the interactions that will happen within the platform and the features that will be implemented. These descriptions will serve as a basis to later designing in full technical detail and implementing the APIs and connectors. Technologies and existing solutions to be utilised are described, which could enable interoperability and optimise the development. The next step was outlining the platform and the mobile application integration logic, based on the results of the user stories and components prioritisation, which are also included in this deliverable. Special focus is given to the security and privacy aspect of the ChildRescue solution.

1.2 Structure of the deliverable

The deliverable comprises of the following sections:

- Section 1 constitutes a brief introduction to the deliverable, describing its purpose, scope, structure and relation to other work packages.
- Section 2 goes through the engineering process that revisited the user requirements and user stories of D1.1 in order to transform them into the ChildRescue architecture.
- Section 3 presents the ChildRescue conceptual architecture, providing the functional and technical view, as well as an overview of the platform components and descriptions.
- Section 4 includes the ChildRescue integration approach. It visits the technologies and existing tools that will be utilised for the platform implementation. The general integration plan, along with the individual platform and mobile application integration are presented.
- Section 5 is dedicated to security and privacy issues and how they will be handled in ChildRescue from the architectural side.
- Section 6 concludes the deliverable and outlines the next steps regarding the platform implementation and the presented deliverable.

1.3 Relation to other WPs & Tasks

D3.1-“ChildRescue Architecture and Platform Design” documents work done for T1.1 until [M12] of the project. It takes as input the user requirements and user stories reported in D1.1, the integrated

methodology of D1.3 and the research outcomes of WP2, in order to further elaborate on them, combine them and finally come up with a specific platform architecture. As it contains the first version of the architecture and a mainly functional approach of the components, this deliverable will be used as a basis for the actual development of the platform and the mobile application in T3.2 and T3.3, but will be updated and defined in technical detail in forthcoming deliverables, namely D3.3 and D3.4. The system’s architecture could also be modified based on the outcomes of technical testing in T3.4 and the pilot experimentation of WP4.

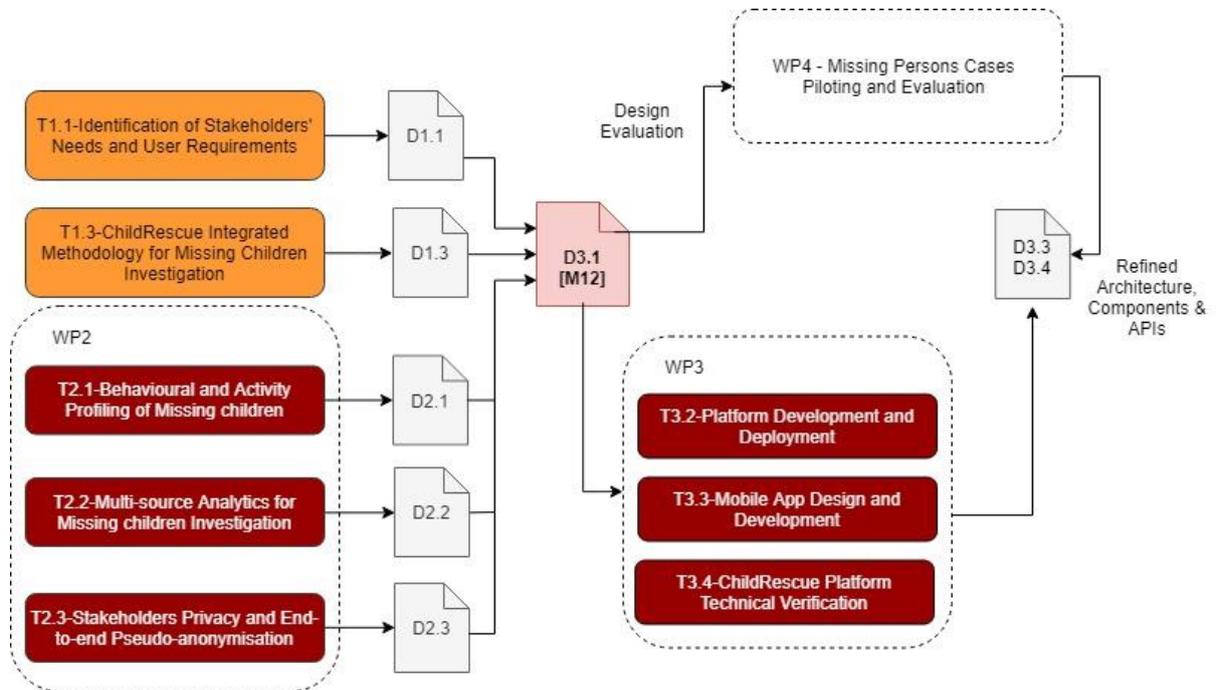


Figure 1-1 - Relation to other WPs & Tasks

2 Requirements Engineering

In this section we explore the engineering process which transformed the requirements listed in D1.1, the integrated methodology of D1.3 and the results of the work on the methodological foundations conducted in WP2, into the conceptual ChildRescue architecture which is presented in the current document.

In D1.1, the ChildRescue requirements were categorised into business, stakeholder and system requirements. Starting from the identification of the business requirements through interviews conducted with the pilots and shared questionnaires, the stakeholders and the expected ways in which they will benefit from the platform were elicited. Afterwards, and taking as input the questionnaires and interviews with the pilots, the AS-IS and TO-BE scenarios were developed for both use cases (missing child & unaccompanied minor). These scenarios showcase the contribution of ChildRescue to existing processes, thus helping clarify the user requirements. The user requirements were matched to the relevant stakeholders and divided in the 4 sub-processes identified from the scenarios. Finally, the system requirements were specified, consisting of the user stories and use case scenarios, along with the generalised requirements that arose from linking the user to/ as a first approach to drawing the technical requirements. A mixture of the waterfall and agile models is adopted in ChildRescue, therefore the requirements identified from the early stages of the project in D1.1, were expected to be modified and enriched during its whole lifetime.

The following engineering process took place in the context of this deliverable, in order to appropriately define the ChildRescue backlog, providing the basis for the architecture and components definition.



Figure 2-1 - Requirements Re-engineering Process

By the time of designing of the ChildRescue architecture which is presented in the current deliverable, additional pilot feedback had been attained and further clarification of the user needs and expectations was achieved, through workshops and meetings among the partners. The integrated methodology of D1.3 provided a framework to better understand how the individual tasks and user stories would be assembled to form the unified platform.

The initially recorded requirements were revisited in order to reflect this new knowledge. Due to the higher stage of maturity achieved by now, some requirements which had been relatively vaguely formulated in D1.1, were clarified here. Additionally, modifications in the wording or even the removal of some user stories has been performed when needed, along with the enrichment of the backlog with two new actors and additional user stories that emerged from the design process.

Afterwards, the revisited user stories underwent a prioritisation process, both from user and technical side, in order to quantify the total importance and urgency of each user story to the platform functionality and in consequence give a rough implementation order for the platform components and functionalities.

Lastly, for the conceptual architecture to take shape, a design process was followed, which is presented in detail in chapter 4 of this deliverable.

As with D1.1, the requirements presented here are not expected to remain unmodified until the end of the project. During the development process, we expect that a better understanding will be acquired, through continuous communication with the pilots on questions and problems that emerge. As the platform development is iteratively realised, with testing and user feedback on the implemented features included, improvements will happen.

2.1 User Requirements

A first approach to the user requirements was performed right from the early stages of the project, thus they were intentionally not described in detail. They provided a useful basis for outlining the platform's functionalities before the actual development. However, as the project progresses and becomes clearer among the partners, the initial requirements can change, whilst new emerge.

In D1.1, user requirements and stories were related to ChildRescue Actors. In the meantime, two new Actors have emerged, the "Team Leader", as the connecting link among Team Members and the Network Manager, and the "ChildRescue Administrator", who has an administrative role regarding ChildRescue and has no interference with the investigations. The ChildRescue Actors, who are referred to in the user requirements and the user stories, are presented in the following Table 2-1. It should be noted that a special category of entities is also included, which although considered as actors, are not direct users of the system. These are the "Special Actors".

Table 2-1 - ChildRescue Actors

Actor	Description	Abbreviation
Visitor (Anonymous user)	A user that lands on the ChildRescue platform page or downloads the mobile app without logging in. This user is allowed to have a limited interaction with the platform.	VU
Simple User (Registered user)	A registered user that has access to platform features of action phase of the investigation. Naturally, this user <i>inherits all privileges (user stories as well) of the "Visitor" user.</i>	SU
Search & Rescue / Volunteer Team Member	A registered and authenticated user that has access to features of the coordination and action phases of the investigation. Although for ChildRescue they act as one unified role, outside the platform there is a distinction among S&R members and volunteers. Volunteers do not usually carry	RT

	<p>some special skill and follow a shorter and more generic educational training. In contrast to that, members of a Search & Rescue Team have years of expert training and have special skills and equipment that offer to the investigation cause. Both are approved off-line by the Organisation however.</p> <p><i>Inherits all privileges of the "Simple User".</i></p>	
Search & Rescue / Volunteer Team Leader	<p>A registered and authenticated user, that has the overview of a specific operating team and is the connecting link among the Network Manager and the team members.</p> <p><i>Inherits all privileges of the "Search & Rescue / Volunteer Team Member".</i></p>	TL
Hosting Facility Manager	<p>A registered and authenticated user, usually a social worker, that is in charge of an accommodation centre of the Organisation.</p> <p><i>Inherits all privileges of the "Simple User".</i></p>	FM
Organisation Case Manager	<p>A registered and authenticated user, usually a social worker, that can feed the system with profiling data and information during the whole process of investigation for a specific case.</p> <p><i>Inherits all privileges of the "Simple User".</i></p>	CM
Organisation Network Manager	<p>A registered and authenticated user that is responsible for the network management, i.e. The human resources outside the Organisation, for a specific case.</p> <p><i>Inherits all privileges of the "Simple User".</i></p>	NM
Organisation Coordinator Manager	<p>A registered and authenticated user that can initiate and coordinate the whole process of investigation and archive a case when it is closed. <i>Inherits all privileges of the "Organisation Case Manager" and the "Organisation Network Manager".</i></p>	OM
Organisation Owner	<p>A registered and authenticated user that can setup an Organisation and manage its users and roles. Has an overview of all phases for all cases, past and present.</p> <p><i>Inherits all privileges of the "Organisation Coordinator Manager".</i></p>	OO
ChildRescue Administrator	<p>A registered and authenticated user that can register the Organisation in the platform. He represents the ChildRescue side and doesn't interfere with the cases.</p>	CA
Special Actors		
Organisation	<p>Organisation is an Actor but not a user per se. It is the only "user" the simple users can see and contact. It can be considered an Alias for the Organisation Owner.</p>	

Missing child	This is a special case of an actor since this person is the target of the investigation mission. He or she may contact the platform to ask for help.
Parent/Guardian/Relative of the missing child	The actual cause of the initiation of the investigation mission. They may be granted special access by an Organisation in order to passively follow the progress - only- of their case (view news & announcements).

Following is the updated list of user requirements. A new subprocess has been added, namely the "Facility Management", regarding the unaccompanied migrant minor use case. Some of the old requirements could now be more explicitly described, therefore rephrasing was performed where needed. Some related actors in the description have been modified, as we now have a better understanding of the role, rights and jurisdiction each ChildRescue user group should have in the platform.

The user requirements are set out in the following tables, grouped by use case in Table 2-2 and Table 2-3 respectively. A total of 49 user requirements are listed, with 11 of them being new additions, 13 updated versions of the D1.1 requirements, and the rest have remained unchanged from D1.1. The abbreviations used for the related Actors, along with their descriptions, were presented in - ChildRescue Actors Table 2-1.

Every user requirement is marked with a colour, depending on whether it is unmodified, updated or totally new, following this colour code:

unmodified user requirement
modified user requirement
new user requirement

Table 2-2 –User Requirements for Missing Child Use Case

old # in D1.1	Sub-Process	User Requirement Description	Related Actors
1	Core	Registration to the ChildRescue platform.	All
2	Core	Different access level and privileges for each user group.	All
new	Core	Registration of advanced users from other authorised user groups.	CM, OC, OO

new	Core	A super light app for simple users and visitors and an enhanced app, requiring a special verification process, for advanced users.	All
new	Core	Registration of core platform actions to the blockchain ledger, as an anonymised and privacy aware log.	All
new	Preparation/ Profiling	Creation and continuous update of new case profiles using extensive forms.	CM, OC
3	Preparation/ Profiling	Ability to upload case files to the platform, including information from multiple sources (personal details, psychosocial reports, social media profiles) about the child.	CM, OC
4	Preparation/ Profiling	Easily retrieve information and patterns or correlations pertaining to the specific case and to past similar cases and profiles.	CM, OC
5	Preparation/ Profiling	Receive suggestions by the system on possible Points of Interest regarding the child. The POIs could be calculated based on testimonies, historical data (if any) and social media preferences and past activity analysis.	CM
6	Preparation/ Profiling	Fast collection of information from all users that actively participate in the investigation and can enhance the profiling process.	CM
7	Preparation/ Profiling	Fast distribution of the available case data and information submitted through the mobile app to relevant authorised user groups.	RT, TL, NM, CM, OC
8	Collaboration/ Coordination	Improved communication and data exchange between the Organisation and citizens through the mobile app.	VU, SU, CM
9	Collaboration/ Coordination	Improved communication and information exchange between the Organisation and Volunteer/Rescue teams using a real-time collaboration space.	RT, TL, NM, CM
10	Collaboration/ Coordination	Notification of registered Volunteers/Rescue team members on new investigation operations and request for participation. Affirmation of their availability.	RT, TL, NM
11	Collaboration/ Coordination	Real-time guidance from Network Managers and Team Leaders through a real-time collaboration space.	RT, TL, NM
12	Collaboration/ Coordination	Improve cross-border and international cooperation with other Amber Alert national entities, or with other organisations/ NGOs.	NM, CM, OC, OO
13	Collaboration/ Coordination	Direct contact with specific users and citizens, when more details from them on a case are required.	VU, SU, CM, OC
14	Collaboration/ Coordination	Real-time geolocation sharing of Volunteer/Rescue team members during their active participation in an operation.	TL, NM, CM, OC
new	Collaboration/ Coordination	Task assignment to Volunteer/Rescue team members.	RT, TL, NM

15	Action Stage	Enhance the monitoring of each case's progress and create suggestions about future steps (routes to follow, POIs to search)	NM, CM
16	Action Stage	Users may share (anonymously or not) potential evidence (multimedia files, location data) in case they think they have traced the missing child or have any other piece of information.	VU, SU, RT
17	Action Stage	Location-based alerts to users. Crowd validation of user-submitted evidence, through notification diffusion in the specific geolocation.	VU, SU, CM, OC
18	Archiving	Cases are closed in a privacy-respectful manner and are semantically annotated for easier retrieval.	CM, OC
19	Archiving	Past cases are available for analysis and pattern matching with current cases.	CM, OC
20	Archiving	After closure of a case, all sensitive private data will be removed from the platform and public access/users' devices. Only statistics and non-personal data could remain public.	CM, OC

Table 2-3 –User Requirements for Unaccompanied Migrant Minor Use Case

old # in D1.1	Sub-Process	Updated Requirement Description	User group (related Actors)
1	Core	Registration to the ChildRescue platform.	All
2	Core	Different access level and privileges for each user group.	All
new	Core	Registration of advanced users from other authorised user groups.	CM, FM, OC, OO
new	Core	A super light app for simple users and visitors and an enhanced app, requiring a special verification process, for advanced users.	All
new	Core	Registration of core platform actions to the blockchain ledger, as an anonymised and privacy aware log.	All
new	Facility Management	Hosting facility monitoring through a digital presence record of hosted minors. Generation of absence notifications for Facility Managers	FM, OC
new	Facility Management	Overview of facility's capacity and any vacancies.	FM, OC

new	Preparation/ Profiling	Creation and continuous update of new children profiles using extensive forms. Matching of the new profile with existing ones, avoiding multiple registrations.	FM, OC
3	Preparation/ Profiling	Collect all available information about the unaccompanied minor from current and past hosting facilities, avoiding multiple registrations and duplicates.	CM, FM
4	Preparation/ Profiling	Make use of digital content (text data from forms, photos) and social media for minors' enhanced profiling.	CM, FM
5	Preparation/ Profiling	Improve the data exchange and synergies between departments of RC for a more complete profiling process.	CM
6	Preparation/ Profiling	Information sharing between the Organisation and hosting facilities. Instant transfer of minor's record in case of transportation between facilities.	CM, FM
7	Preparation/ Profiling	In case of a tracing request, all relevant Stakeholders should be notified and have access (according to their role) to relevant documents and information through the platform.	RT, TL, NM, CM
8	Collaboration/ Coordination	Improve the communication and information exchange between the RC services, the volunteer corps, the search & rescue teams and the authorities by using a collaboration space	RT, TL, NM, CM
9	Collaboration/ Coordination	Notification of registered Volunteers/Rescue team members on new investigation operations and request for participation. Affirmation of their availability.	RT, TL, NM
10	Collaboration/ Coordination	Real-time guidance from Network Managers and Team Leaders through a real-time collaboration space.	RT, TL, NM
11	Collaboration/ Coordination	Improve cross-border and international cooperation with other RC national societies, or with other organisations/ NGOs.	NM, CM, FM, OC, OO
12	Collaboration/ Coordination	Instant notification sent to Volunteer/Rescue team members on emergencies and natural disasters.	RT, TL, NM, CM
13	Action Stage	Location-based alerts to citizens regarding a natural disaster or emergency and relevant information.	VU, SU, NM, CM
14	Action Stage	Necessary information available on-the-fly to participating Volunteer/Rescue team members through the enhanced mobile application.	RT, TL, NM, CM
15	Action Stage	Real-time geolocation sharing of Volunteer/Rescue team members (e.g. Samaritans) during their active participation in an operation.	RT, TL, NM, CM
16	Archiving	Cases are closed in a privacy-respectful manner and are semantically annotated for easier retrieval. Paperwork and printed material should be reduced.	CM, OC
17	Archiving	Unify information and eliminate overlaps among departments by using a common database structure. Necessary for analysing past data and find patterns.	CM, FM, OC

18	Archiving	After closure of a case, all sensitive private data will be removed from the platform and public access/users' devices. Only statistics and non-personal data could remain public.	CM, OC
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2.2 User Stories per Actor

User stories constitute a brief description of an interaction between the user and the system, as seen from the user's perspective and including the value proposition for the user. They are extremely useful, as they shred the more generally formatted and impersonal requirements to specific functionalities and relate them to user groups. The user stories backlog of D1.1 although fairly extensive, could not be exhaustive. Necessary additions have been made, user stories have been removed or rephrased. They will be further analysed during the platform implementation, as sub-tasks will emerge and details will need to be clarified.

The 80 modified or added user stories are listed in the following Tables. Of them, 53 are newly added user stories, 17 are modified user stories from D1.1 and 10 are user stories that have been removed from the backlog.

In "ANNEX II – User Stories Backlog", the complete user story backlog is presented, along with the voting results.

Table 2-4 - Updated User Stories for Actor Visitor

#	Epic	Old User Story Description (D1.1)			Updated User Story Description	
		ACTOR	GOAL/DESIRE	BENEFIT	GOAL/DESIRE	BENEFIT
		As a ...	I want...	, so that...	I want...	, so that...
VU.02	Platform Browsing	Visitor	to be able to view a list of currently active missing children cases	I can actively participate in the investigation.	to be able to view a list of currently active missing children cases near my vicinity, if my geolocation is enabled	I can actively participate in the investigation.
VU.02.1	Platform Browsing	Visitor	N/A	N/A	to have only one active notification per case	I have a clear overview of all cases and my device is not spammed with notifications.
VU.07	Platform Browsing	Visitor	to be able to view information about DOs and DON'Ts regarding missing children investigation.	I can assist the investigation in an appropriate and correct - for the child at risk - manner.	to be able to view information about DOs and DON'Ts regarding missing children investigation.	I can assist the investigation in an appropriate for the child at risk manner, abiding by the law and respecting human rights.
VU.08.1	Investigation Coordination/ Communication	Visitor	N/A	N/A	to be able to submit a piece of information, even for a case I am not informed about with a notification (e.g. if I meet a child alone on the street)	I can assist also in cases that I am not actively informed about through ChildRescue.

Table 2-5 – Updated User Stories for Actor Simple User

#	Epic	Old User Story Description (D1.1)			Updated User Story Description	
		ACTOR	GOAL/DESIRE	BENEFIT	GOAL/DESIRE	BENEFIT
		As a ...	I want...	, so that...	I want...	, so that...

SU.04	Profile Editing	Simple User	to be able to permanently remove my account credentials from the system	I can no longer log-in and not be contacted by other users.	to be able to use my "right to be forgotten" under the GDPR, and permanently remove my account from the system	I can no longer log-in and not be contacted by other users.
SU.06	Profile Editing	Simple User	to be able to apply for volunteer for a selected organisation	I can offer my services in a more official and permanent way and get more privileges in the platform.	to get informed on the process to become a volunteer for a specific organisation	I can offer my services in a more official and permanent way and get more privileges in the platform.
SU.07	Platform Browsing	Simple User	to view a list of currently missing children, last seen around my current location	I can actively search for them.	to view a list of currently missing children, last seen around my current location	I can have an open eye for them.
SU.09	Platform Browsing	Simple User	to filter out cases based on physical characteristics, such as age, hair colour, clothing	I can focus on the right case, in situations where I have a clear live view of a child.	REMOVED STORY	
SU.10	Platform Browsing	Simple User	to be able to share information about a case on my social media accounts	I further disseminate information about the case to a larger audience.	REMOVED STORY	
SU.11.1	Platform Browsing	Simple User	N/A	N/A	to see statistics (e.g. cases solved per country) in front page if there are no active cases in vicinity, or as menu item if there are	I have a general picture of the work done by the organisations.
SU.12	Investigation Coordination/ Communication	Simple User	to send feedback in the form of text, image or video to the organisation concerning a missing child without the need to fill-in a long form	I can assist in the investigation mission in a quick and efficient manner.	to send geotagged and timestamped feedback in the form of text, image or video to the organisation concerning a missing child without the need to fill-in a long form	I can assist in the investigation mission in a quick and efficient manner.
SU.13	Investigation Coordination/ Communication	Simple User	to get notified when I have a direct message received	I know a response to my message was provided.	to get notified when I have a direct message received	I know that there is a response to the information I uploaded.

SU.16	Investigation Coordination/ Communication	Simple User	to get notified when announcements are made concerning a case in my vicinity	I can be informed with latest news regarding the case.	REMOVED STORY	
SU.16.1	Investigation Coordination/ Communication	Simple User	N/A	N/A	to have the option to select and "follow" specific cases	I still receive notifications for them, even when I am outside the notification area.
SU.17	Investigation Coordination/ Communication	Simple User	to get notified when a case is closed	I can stop any actions I have taken.	to get notified when a case I follow or had been notified for (even once), is closed	I can stop any actions I have started.
SU.18	Investigation Crowd-sourcing Action	Simple User	to evaluate a piece of information, if requested	I can validate if it is true or false according to my knowledge.	REMOVED STORY	

Table 2-6 - Updated User Stories for Actor S&R/Volunteer Team Member

#	Epic	Old User Story Description (D1.1)			Updated User Story Description	
		ACTOR	GOAL/DESIRE	BENEFIT	GOAL/DESIRE	BENEFIT
		As a ...	I want...	, so that...	I want...	, so that...
RT.02	Investigation Coordination/ Communication	S&R/Volunteer Team Member	to get rapidly notified when there is a missing child case and my team is required	I can act on it, get the team assembled and help the investigation in the field.	to get rapidly notified when there is a missing child case and my contribution is required	I can act on it and help the investigation in the field.
RT.02.1	Investigation Coordination/ Communication	S&R/Volunteer Team Member	N/A	N/A	to be able to decline an invitation to join investigation team and continue as a simple user for this specific case if at all	if i am not able to actively participate as a team member, still be able to help and receive location-based notifications as any simple registered user.

RT.03	Investigation Coordination/ Communication	S&R/Volunteer Team Member	to have access to a discussion channel with my team-members and case coordinators	I can get communicate with my team in a secure and private virtual space and exchange real-time messages.	to have access to a collaboration space with other team-members and case coordinators	I can communicate with my team in a secure and private virtual space.
RT.03.1	Investigation Coordination/ Communication	S&R/Volunteer Team Member	N/A	N/A	to be able to turn my geolocation off temporarily, but continue receiving the messages and notifications of the discussion team	I can pause and rest from an active investigation I am taking part in, but still be updated with latest news.
RT.03.2	Investigation Coordination/ Communication	S&R/Volunteer Team Member	N/A	N/A	to be able to quit from an investigation case and the related collaboration space	I can disengage from the search operations of this case and the respective team's affairs.
RT.04	Investigation Coordination/ Communication	S&R/Volunteer Team Member	to be able to upload/download files of information in the discussion channel	I can exchange multimedia files, like photos or videos, with team members and my superiors.	REMOVED STORY	
RT.05	Investigation Coordination/ Communication	S&R/Volunteer Team Member	to get guidance and real-time profiling information about the case from coordinators	I can be constantly informed about the case's status and act in a more efficient way.	to get guidance and real-time announcements about the case from my superiors	I can be constantly informed about the case's status and act in a more efficient way.
RT.05.1	Investigation Coordination/ Communication	S&R/Volunteer Team Member	N/A	N/A	to have a list of the tasks I was assigned and be able to mark them when done	I have a clear overview of what I have to do.
RT.05.1.1	Investigation Coordination/ Communication	S&R/Volunteer Team Member	N/A	N/A	to keep a task history	I can keep track of my past activities and my superior has a better overview.
RT.06	Investigation Coordination/ Communication	S&R/Volunteer Team Member	to be able to watch my current location, as well as other team members' locations, on an interactive map	I can have a clear overview of the team's current situation and the area each member covers.	REMOVED STORY	

Table 2-7 - Updated User Stories for Actor S&R/Volunteer Team Leader

#	Epic	Old User Story Description (D1.1)			Updated User Story Description	
		ACTOR	GOAL/DESIRE	BENEFIT	GOAL/DESIRE	BENEFIT
		As a ...	I want...	, so that...	I want...	, so that...
TL.01	Investigation Coordination/ Communication	S&R/Volunteer Team Leader	N/A	N/A	to be able to watch my current location, as well as other team members' locations, on an interactive map	I can have a clear overview of the team's current situation and the area each member covers.
TL.02	Investigation Coordination/ Communication	S&R/Volunteer Team Leader	N/A	N/A	to get guidance and real-time announcements about the case from coordinators	I can be constantly informed about the case's status and act in a more efficient way.
TL.03	Investigation Coordination/ Communication	S&R/Volunteer Team Leader	N/A	N/A	to have access to a collaboration space with teams and case coordinators with the ability to upload/download files	I can offer the necessary information (e.g. a profile record) to the investigation group or my superiors.

Table 2-8 - Updated User Stories for Actor Hosting Facility Manager

#	Epic	Old User Story Description (D1.1)			Updated User Story Description	
		ACTOR	GOAL/DESIRE	BENEFIT	GOAL/DESIRE	BENEFIT
		As a ...	I want...	, so that...	I want...	, so that...
FM.03	Investigation Profiling	Hosting Facility Manager	to be able to find a minor that is documented in the system using multiple profiling criteria and fuzzy matching	when a minor comes to my care, I can have access to his history and be able to notify other facilities that the minor isn't missing	to automatically match a new child profile with existing profiles using multiple criteria	I can identify if a new-coming minor has been registered before or belongs to another facility.

FM.04.1	Investigation Profiling	Hosting Facility Manager	N/A	N/A	to be able to save the case info and documents in the ChildRescue platform	I can easily find and make changes to the history of a minor under my responsibility.
FM.05.1	Facility Management	Hosting Facility Manager	N/A	N/A	to be able to signify presence or absence of minors under my hosting facility, for ex. With a tick on their photo when I see them (presentation record)	I can have an easier overview of the facility and the hosted minors.
FM.05.2	Facility Management	Hosting Facility Manager	N/A	N/A	to be notified by the system when a child's presence has not been updated within 24 hours	I can detect in time a possible disappearance.
FM.05.3	Facility Management	Hosting Facility Manager	N/A	N/A	the system to be updated regarding vacancies in my hosting facility	they are easily informed and can decide on the distribution of the applications for hosting.
FM.05.4	Facility Management	Hosting Facility Manager	N/A	N/A	my superiors/ the central hosting facilities management to see the state of my facility regarding capacities, etc	there is better distribution of the applications for hosting.
FM.05.5	Facility Management	Hosting Facility Manager	N/A	N/A	to be able to add a small report when a voluntary departure occurs	for better and more complete archiving purposes.
FM.08	Investigation Coordination/ Communication	Hosting Facility Manager	to have access to a collaboration space with teams and case coordinators with the ability to upload/download files	I can offer the necessary information (e.g. a profile record) to the investigation group or my superiors.	REMOVED STORY	

Table 2-9 - Updated User Stories for Actor Organisation Case Manager

#	Epic	Old User Story Description (D1.1)	Updated User Story Description
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		ACTOR	GOAL/DESIRE	BENEFIT		GOAL/DESIRE	BENEFIT
		As a ...	I want...	, so that...		I want...	, so that...
CM.01.1	Investigation Profiling	Organisation Case Manager	N/A	N/A		to be able to upload a scanned document of signed consent	I can have documents related to a case gathered and easily retrievable.
CM.01.2	Investigation Profiling	Organisation Case Manager	N/A	N/A		to be able to save the case info and documents in the ChildRescue platform	I can easily find and make changes to the history of a minor under my responsibility.
CM.01.3	Investigation Profiling	Organisation Case Manager	N/A	N/A		to have access to all cases	I can handle whichever case I am assigned from the Coordinator and information is not lost between different shifts.
CM.01.3.1	Investigation Profiling	Organisation Case Manager	N/A	N/A		to have a prioritised view of the cases based on case level (amber alert, simple alert, open missing case), my association to every case	I have a better overview of the cases and most important/urgent ones have a better ranking
CM.01.4	Investigation Profiling	Organisation Case Manager	N/A	N/A		to automatically match a new child profile with existing profiles using multiple criteria and intelligent methods	I can check if it's a multiple case or if there is an active tracing request
CM.01.5	Investigation Profiling	Organisation Case Manager	N/A	N/A		to be able to find a case that is documented in the system using multiple profiling criteria	I can see if it is a multiple case, or there are other cases with strong resemblance.
CM.02	Investigation Profiling	Organisation Case Manager	to update the information of a case with more details or specify crucial information (like location last seen, latest info gathered, etc.)	I can offer an updated description of a case.		to update and extend the information of a case with more details or specify crucial information (like location last seen, latest info gathered, etc.)	I can offer an updated description of a case.

CM.02.1	Investigation Profiling	Organisation Case Manager	N/A	N/A	to update an open case whenever new information occurs	all case data is stored in a well-maintained and continuous manner.
CM.05.1	Investigation Profiling	Organisation Case Manager	N/A	N/A	to perform profiling analytics	I can have insights and predictions on behavioural patterns of the case.
CM.07.1	Investigation Coordination/ Communication	Organisation Case Manager	N/A	N/A	to be able to set up a collaboration space dedicated to the missing child case and a specified general location (ex. Case 128 in Ioannina)	I can invite rescue and volunteer teams close to the area, monitor and manage them.
CM.13	Investigation Coordination/ Communication	Organisation Case Manager	to issue global news and announcements about a case	I can notify all users of important news	REMOVED STORY	
CM.13.1	Investigation Crowd Sourcing Action	Organisation Case Manager	N/A	N/A	all notifications sent through the platform to the general public to include only information approved by the authorities	the whereabouts of the missing child cannot be inferred and malicious use of the platform is prevented.
CM.13.2	Investigation Crowd Sourcing Action	Organisation Case Manager	N/A	N/A	to configure the dissemination area of the notifications that will be sent to users based on the data analytics results and my expertise	crowdsourcing is more focused and efficient.
CM.14	Investigation Coordination/ Communication	Organisation Case Manager	to issue directions and information to group of users based on their location	I can notify only users that are actually near a point of interest	REMOVED STORY	
CM.18.1	Investigation Monitoring	Organisation Case Manager	N/A	N/A	every case in my dashboard to have a notification sign	I can distinguish cases with updates which I haven't seen yet.
CM.18.1.2	Investigation Monitoring	Organisation Case Manager	N/A	N/A	to be able to click on a notification and directly go to the case	I can easily browse all available info on a case and better relate the notification.

CM.18.2	Investigation Monitoring	Organisation Case Manager	N/A	N/A	to easily handle cases of siblings, correlate them and avoid double typing	I work more efficiently but at the same time cover all possible scenarios (children are together or separated).
CM.18.3	Investigation Monitoring	Organisation Case Manager	N/A	N/A	to create a list of missing people cases which will be correlated	I can handle a natural disaster incident efficiently and quickly.
CM.18.4	Investigation Monitoring	Organisation Case Manager	N/A	N/A	to ensure that all evidence from users will remain logged and unchanged	the platform operates based on integrity and trust.
CM.21	Archiving	Organisation Case Manager	N/A	N/A	to semantically tag a case	it can be easier matched to similar past or future cases.
CM.22	Archiving	Organisation Case Manager	N/A	N/A	the case data of a closed case to be deleted from the users' devices within a fixed period of time	the privacy of the child and family is protected after closure.

Table 2-10 - Updated User Stories for Actor Organisation Network Manager

#	Epic	Old User Story Description (D1.1)			Updated User Story Description	
		ACTOR	GOAL/DESIRE	BENEFIT	GOAL/DESIRE	BENEFIT
		As a ...	I want...	, so that...	I want...	, so that...
NM.02	Investigation Coordination/ Communication	Organisation Network Manager	to be able to notify all S&R teams or/and volunteer teams to log in to the platform	we can setup a collaboration space about the case and the investigation.	to be able to invite available volunteer/S&R members, to join collaboration space	we can setup a collaboration space about the case and the investigation.

NM.02.1	Investigation Coordination/ Communication	Organisation Network Manager	N/A	N/A	to be able to notify with free-text message all volunteers of local S&R teams or/and volunteer teams of the new case and receive their availability	I can setup teams for the investigations and give volunteers some basic contact details.
NM.02.2	Investigation Coordination/ Communication	Organisation Network Manager	N/A	N/A	to receive a confirmation of delivery for every invitation I have sent to volunteers	I know if my notification has reached the members.
NM.02.3	Investigation Coordination/ Communication	Organisation Network Manager	N/A	N/A	to be able to manually assign the team leader of every volunteer/S&R team from the available members	it is easier to coordinate separate teams.
NM.02.4	Investigation Coordination/ Communication	Organisation Network Manager	N/A	N/A	to be able to contact other organisations' network managers that also use the ChildRescue platform and ask for help in resources	the required human and other resources are assembled for the operations.
NM.02.5	Investigation Coordination/ Communication	Organisation Network Manager	N/A	N/A	to be able to notify new members and teams to join the collaboration space according to the investigation progress, especially if a new geographical location is suggested	adequate rescuers and volunteers are participating in each stage and place of the investigation.
NM.03	Investigation Coordination/ Communication	Organisation Network Manager	to have access or be able to create a discussion channel with the team-members and case coordinators	I can guide my teams in a secure and private virtual space and exchange real-time messages	to be able to engage in real time discussions with selected team leaders and case managers	I can guide my teams in a secure and private virtual space.
NM.03.1	Investigation Coordination/ Communication	Organisation Network Manager	N/A	N/A	to be able to post announcements for all team members participating in the case to view, similar to a news feed	I can give one-way instructions to the teams, which will be easily viewable.
NM.03.2	Investigation Coordination/ Communication	Organisation Network Manager	N/A	N/A	to mark important announcements in the timeline with different colour (highlight them somehow)	the volunteers can easily see what I think is important.

NM.03.3	Investigation Coordination/ Communication	Organisation Network Manager	N/A	N/A	assign tasks to participating team members	they can have a clear view of what they have to do
NM.03.4	Investigation Coordination/ Communication	Organisation Network Manager	N/A	N/A	to create chat rooms with selected members from the volunteer/S&R teams for communications	I can instantly exchange information with team leaders.

Table 2-11 - Updated User Stories for Actor Organisation Coordinator

#	Epic	Old User Story Description (D1.1)			Updated User Story Description	
		ACTOR	GOAL/DESIRE	BENEFIT	GOAL/DESIRE	BENEFIT
		As a ...	I want...	, so that...	I want...	, so that...
OC.02.1	Investigation Coordination/ Communication	Organisation Coordinator	N/A	N/A	to be able to send the case file and documents to organisations in another country	I can rapidly inform and activate legitimate organisations in case of a cross-border country
OC.03	Investigation Coordination/ Communication	Organisation Coordinator	to be able to engage in real time discussions with user groups (e.g. volunteers, rescue teams)	I can get real-time feedback from a group of people.	to be able to engage in real time discussions with user groups (e.g. volunteers, rescue teams)	I can carry forward relevant information in a secure and private virtual space and exchange real-time messages.
OC.04	Investigation Coordination/ Communication	Organisation Coordinator	to issue global news and announcements about any case	I can notify all users of important news.	REMOVED STORY	
OC.09.1	Investigation Management	Organisation Coordinator	N/A	N/A	to have access to the activity history of all case managers	I have a clear overview of the taken actions and be able to allocate cases accordingly.
OC.11	Archiving	Organisation Coordinator	N/A	N/A	to aggregate data from past cases	useful outcomes are provided to be exploited in the future, in a manner always respecting privacy aspects.

OC.12	Archiving	Organisation Coordinator	N/A	N/A	statistics to be generated from every case and to be correlated	I gain insights in the performance of the organisation.
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Table 2-12 - Updated User Stories for Actor Organisation Owner

#	Epic	Old User Story Description (D1.1)			Updated User Story Description	
		ACTOR	GOAL/DESIRE	BENEFIT	GOAL/DESIRE	BENEFIT
		As a ...	I want...	, so that...	I want...	, so that...
OO.01	Organisation Information Filling	Organisation Owner	N/A	N/A	to receive invitation to activate my organisation's profile in ChildRescue	I take control of the new profile and start managing it.
OO.02	Organisation Management	Organisation Owner	to be able to view a list of all available users belonging to my organisation and at what position	I can have an overview of our human resources assignments	to be able to view a list of all available users belonging to my organisation and at what position and location	I can have an overview of our human resources assignments
OO.11	Organisation Policy	Organisation Owner	N/A	N/A	all case data to be anonymised	the privacy of the family and the child are protected and my organisation is aligned to the GDPR requirements.
OO.12	Organisation Policy	Organisation Owner	N/A	N/A	all case data to be encrypted	I ensure my organisation's compliance to the GDPR.

Table 2-13 - Updated User Stories for Actor ChildRescue Administrator

#	Epic	Old User Story Description (D1.1)		Updated User Story Description
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		ACTOR	GOAL/DESIRE	BENEFIT		GOAL/DESIRE	BENEFIT
		As a ...	I want...	, so that...		I want...	, so that...
CA.01	ChildRescue Management	ChildRescue Administrator	N/A	N/A		to create the organisation profile and add the organisation owner	the organisation can use ChildRescue.

2.3 User Story Prioritisation

The identified user stories will serve as features offered to the end-users and will have to be implemented from the development teams. While all of them add some value to the system, it might not be equally essential for the stakeholders. Thus, it is crucial to organise the user stories accordingly, for better development planning and delivery of all needed functionalities in time. Another factor that has to be taken into consideration, is that a feature of little direct relevance to the end-users, might be a prerequisite for the proper function of the whole system and inevitably must be high in the prioritisation list. The technical side is responsible for deciding that.

The applied prioritisation process was based on the model proposed by Lant¹, which was adapted accordingly to fit our case. The Lant model introduces a two-dimensional approach to the user stories ranking, based on two assessment vectors (originally, time and business value). Following is the multiplication among the two factors of each user story and their final story ranking based on a priority range table.

From this point on, we will present the whole prioritisation process, as modified and applied for the purposes of ChildRescue. In order for both, sometimes conflicting, perspectives on the features to be included, we defined two main assessment vectors: the user side and the technical side. Two distinct voting processes were conducted, one by the pilot users and one by the technical partners, in order to accumulate the user stories values.

The three pilots were requested to rank the user stories based on two criteria: end-user value and time urgency. The end-user value describes the expected benefit for the user base, while the time urgency factor shows how soon the pilot organisations wish for the feature to be available. The ranking guidelines suggested to the pilots were the following:

Table 2-14 - Ranking Guidelines for End User Value Factor

End User Value	
Value	Guidelines
5	Added extreme user value for most or all users
4	Added user value to many users
3	Added user value to a moderate number of users
2	Added user value to only few of the users
1	Added user value to a few or even no users

Table 2-15 - Ranking Guidelines for Urgency Factor

Urgency	
Value	Guidelines
5	Extremely highly prioritised, urgent to have in ChildRescue

¹ <https://michaellant.com/2010/05/21/how-to-easily-prioritize-your-agile-stories>

4	Highly prioritised
3	Moderately prioritised
2	Minimally prioritised
1	Not time constrained

The pilot voting happened in two rounds, due to modifications of user stories after the second plenary meeting in Frankfurt. One thing that should be noted however, is that some user stories cannot be integrated to the normal workflow of an organisation and are therefore marked as N/A (not available) by the pilots. One example is that of user stories responding to the unaccompanied migrant minor scenario and might not be applicable in an organisation not operating any hosting facilities. Another case of non-applicability are the S&R operations specific user stories, which are practically outside the scope of Child Focus. These exceptions will be appropriately handled later on the processing of the voting values. The aggregated results of the pilot voting are presented analytically in ANNEX II.

Afterwards, we proceeded with the voting on the technical side. The three technical partners were requested to rank the user stories based on two assessment factors, which are both related to possible development constraints: the technical feasibility of a user story implementation and whether it is a prerequisite for other features of the platform. The guidelines as provided for the voting, are the following:

Table 2-16 - Ranking Guidelines for Feasibility Factor

Feasibility	
Value	Guidelines
5	Extremely highly feasible
4	Highly feasible
3	Moderately feasible
2	Not easily feasible
1	Very difficult to be implemented

Table 2-17 - Ranking Guidelines for Prerequisite Feature Factor

Prerequisite Feature	
Value	Guidelines
5	Extreme level of dependency of other functionalities on this feature/ Most of other features are dependent on this feature
4	High level of dependency of other functionalities on this feature/ Many other features are dependent on this feature
3	Moderate level of dependency of other functionalities on this feature/ Moderate number of other features are dependent on this feature

2	Extreme level of dependency of other functionalities on this feature/ Few other features are dependent on this feature
1	This feature is not a prerequisite for other features

The next step was the processing of the individual values and the extraction of the two main assessment vectors.

For the first vector (user-side): The user story ranking per pilot was calculated as the mean value of the end-user value and time urgency. Subsequently, for every user story, the overall pilot ranking was calculated as the mean value of the three individual pilot rankings. In case a value from one pilot was missing, as explained above, this particular pilot’s value was set to 1, which is the lowest factor in our range. As a result, this user story’s overall value drops, in order to depict that a user story of no use to one of the three user groups should stand lower in the prioritisation ranking. In the case of hosting facility specific user stories however, only the RedCross was directly involved and voted for them. Here it would not be wise to apply the same technique for the missing values, because it would downgrade significantly the user stories which mainly deliver the unaccompanied migrant minor scenario. As the unaccompanied migrant minor is of equal significance to the missing child scenario, just for these particular user stories, the voting of the RedCross was taken alone in the subsequent calculations.

For the second vector (technical-side): For each technical partner, the user story ranking was found as the mean value of the feasibility and the prerequisite factor. Afterwards we calculated the overall technical ranking for every user story by finding the mean value of the three individual technical votings. In this case there were no missing values to be handled.

The last stage of this process contains the final assessment of the user stories by combining the two vectors. The Priority factor will be the product of the multiplication among the user-side and the technical-side factors and the ranking will be based on the following Figure 2-2:

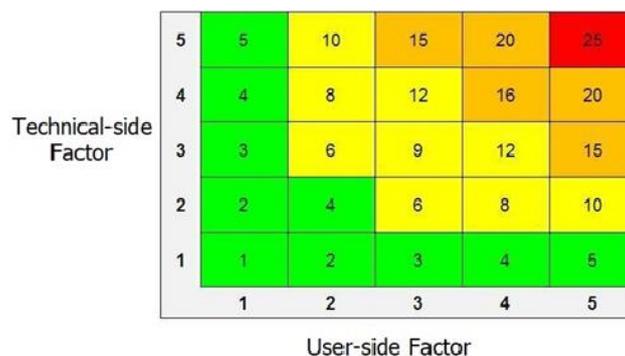


Figure 2-2 - Lant Prioritisation Guide

As shown in the figure, there are 4 areas – distinguished by different colors – dividing the prioritisation scale. At this stage of the ChildRescue platform design, the priorities assigned to the different user stories based on their ranking values can be translated as follows:

25: Critical & Highest Priority – to be included in the first 1-2 development sprints

15-20: Important to be implemented – to be included in the first round of sprints towards the 1st major release of the platform or in the initial sprints of the 2nd major release cycle

6-12: Moderately important – scheduled for later in order to be included in the sprints for the 2nd major release

1-5: Nice to have but low priority – to be scheduled at a later stage

Apparently, the highest total ranking value that a user story can get following Lant's model is 25, however due to the dual-dimensionality of the two main factors (end-user value and urgency for the user side, feasibility and prerequisite for the technical side) and to the fact that the pilot users have different focus points and needs, it is expected that few or no user stories may achieve this maximum value. In any case user stories with a ranking value over 15 (within the orange range in the Figure) shall be considered as highly prioritised.

In this section we present the user stories that, after following the process described above, got high in the ranking. Indeed, no user story got the maximum ranking value of 25, however a number of user stories have achieved values from 15 to 20, so have been characterised as high-priority for being implemented in the ChildRescue platform. It has to be noted that the implementation order of the user stories (defining in which sprint they are going to be included) is not strictly bound by the presented prioritisation, as some features standing high in the ranking require a whole operating infrastructure of other more trivial albeit necessary functionalities, and must therefore be delayed and either to be implemented at the last sprints of the first release of the platform or to be directly presented at the second major release).

In ANNEX II – User Stories Backlog, the complete user story backlog is presented, along with the voting results.

Table 2-18 - User Stories Ranked [15,20]

#	Epic	User Story Description			Voting Result
		ACTOR	GOAL/DESIRE	BENEFIT	
		As a...	I want ...	, so that...	
OO.01.1	Organisation Information Filling	Organisation Owner	to be able to set and edit the basic information about my organisation	I can provide an informative profile of the organisation.	20
SU.04	Profile Editing	Simple User	to be able to use my "right to be forgotten" under the GDPR, and permanently remove my account from the system	I can no longer log-in and not be contacted by other users.	20
FM.04.1	Investigation Profiling	Hosting Facility Manager	to be able to save the case info and documents in the ChildRescue platform	I can easily find and make changes to the history of a minor under my responsibility.	20
CM.01.2	Investigation Profiling	Organisation Case Manager	to be able to save the case info and documents in the ChildRescue platform	I can easily find and make changes to the history of a minor under my responsibility.	20
CM.18.2	Investigation Monitoring	Organisation Case Manager	to easily handle cases of siblings, correlate them and avoid double typing	I work more efficiently but at the same time cover all possible scenarios (children are together or separated).	19,5
CM.18	Investigation Monitoring	Organisation Case Manager	to easily handle cases of siblings, correlate them and avoid double typing	I work more efficiently but at the same time cover all possible scenarios (children are together or separated).	18,66666667
FM.05	Investigation Profiling	Hosting Facility Manager	to be able to edit/replace the documents I have uploaded to the platform	there is always the updated version of all pieces of information regarding a profile record.	17,5
CM.01	Investigation Profiling	Organisation Case Manager	to be able to fill in the basic information about a new missing child case	I can provide basic details on that case.	17,5

CM.01.1	Investigation Profiling	Organisation Case Manager	to be able to upload a scanned document of signed consent	I can have documents related to a case gathered and easily retrievable.	17,5
CM.02	Investigation Profiling	Organisation Case Manager	to update and extend the information of a case with more details or specify crucial information (like location last seen, latest info gathered, etc.)	I can offer an updated description of a case.	17,5
CM.02.1	Investigation Profiling	Organisation Case Manager	to update an open case whenever new information occurs	all case data is stored in a well-maintained and continuous manner.	17,5
CM.03	Investigation Profiling	Organisation Case Manager	to upload relevant multimedia files (e.g. pic of child)	I can offer a more informed description of a case.	17,5
CM.04	Investigation Profiling	Organisation Case Manager	to add social media accounts of the child	I can enhance the profiling process by using knowledge extraction on social profile preferences, activities, public posts, etc.	17,5
CM.05	Investigation Profiling	Organisation Case Manager	to add psychological reviews, witness reports, etc	I can enhance the profiling details of the missing child.	17,5
CM.06	Investigation Profiling	Organisation Case Manager	to close and archive a finished case	All people involved get notified and the case is no longer displayed as active.	17,5
CM.17	Investigation Monitoring	Organisation Case Manager	to monitor the overall progress of the investigation	I can understand at which state it is	17,5
CM.22	Archiving	Organisation Case Manager	the case data of a closed case to be deleted from the users' devices within a fixed period of time	the privacy of the child and family is protected after closure.	17,5
OO.12	Organisation Policy	Organisation Owner	all case data to be encrypted	I ensure my organisation's compliance to the GDPR.	17,5
FM.05.1	Investigation Profiling	Hosting Facility Manager	to be able to signify presence or absence of minors under my hosting facility, for ex. With a tick on their photo when I see them (presentation record)	I can have an easier overview of the facility and the hosted minors.	17,5

FM.05.2	Investigation Profiling	Hosting Facility Manager	to be notified by the system when a child's presence has not been updated within 24 hours	I can detect in time a possible disappearance.	17,5
FM.05.3	Facility Management	Hosting Facility Manager	the system to be updated regarding vacancies in my hosting facility	they are easily informed and can decide on the distribution of the applications for hosting.	17,5
OO.07	Organisation Monitoring	Organisation Owner	to have an overview of all active cases and the human resources (e.g. organisation members, volunteers, etc) assigned on each one	I can have a clear picture of the current effort and possible deficiencies	16,6666667
SU.03	Profile Editing	Simple User	to be able to allow geolocation services	I can be contacted based on my current location.	16,33333333
CM.18.1	Investigation Monitoring	Organisation Case Manager	every case in my dashboard to have a notification sign	I can distinguish cases with updates which I haven't seen yet.	16,33333333
OC.06	Investigation Monitoring	Organisation Coordinator	to monitor the overall progress of all the active investigations	I can understand at which state is each case and what assistance is required.	16,33333333
CA.01	ChildRescue Administration	ChildRescue Administrator	to create the organisation profile and add organisation owner	the organisation can use ChildRescue.	16,33333333
CM.18.1.2	Investigation Monitoring	Organisation Case Manager	to be able to click on a notification and directly go to the case	I can easily browse all available info on a case and better relate the notification.	16,33333333
CM.18.3	Investigation Monitoring	Organisation Case Manager	to create a list of missing people cases which will be correlated	I can handle a natural disaster incident efficiently and quickly.	16
SU.02	Profile Editing	Simple User	to be able to edit my personal profile information	I can have a more complete personal profile which increases my integrity and reliability.	15,1666667

SU.07	Platform Browsing	Simple User	to view a list of currently missing children, last seen around my current location	I can have an open eye for them.	15,16666667
OC.12	Archiving	Organisation Coordinator	statistics to be generated from every case and to be correlated	I gain insights in the performance of the organisation.	15,16666667
OO.04	Organisation Management	Organisation Owner	to setup and assign roles for the organisation members (Case Manager, Network Manager, Coordinator, Volunteer Team member, Search & Rescue Team member)	I can manage the access privileges of my users to the available information and functionality.	15,16666667
OO.06	Organisation Management	Organisation Owner	to delete my organisation	it is no longer part of the ChildRescue platform	15,16666667
VU.06	Platform Browsing	Visitor	to be able to view information about the platform, terms of service and usage, etc	I can be fully aware of what the platform is about and what requirements it involves.	15
SU.01	Registration	Simple User	to be able to specify some basic, optional personal profile information during the initial registration process	I can have a more complete and reliable personal profile which increases my integrity thus making me a trusted collaborator.	15
SU.12	Investigation Coordination/ Communication	Simple User	to send geotagged and timestamped feedback in the form of text, image or video to the organisation concerning a missing child without the need to fill-in a long form	I can assist in the investigation mission in a quick and efficient manner.	15
FM.06	Investigation Coordination/ Communication	Hosting Facility Manager	to be able to rapidly notify the organisation when there is a case of a missing child in my facility	they can act on it and follow the appropriate procedures.	15
FM.07	Investigation Coordination/ Communication	Hosting Facility Manager	the system to automatically notify the managers of other facilities where the child has been before or has friends/relatives there	more people get notified that are relevant to the case.	15

CM.01.5	Investigation Profiling	Organisation Case Manager	to be able to find a case that is documented in the system using multiple profiling criteria	I can see if it is a multiple case, or there are other cases with strong resemblance.	15
OC.10	Investigation Management	Organisation Coordinator	to be able to file a report regarding the management of each case	there is a complete archive for each investigation, not only regarding the goal, but also about the procedures followed by all participants.	15
OO.11	Organisation Policy	Organisation Owner	all case data to be anonymised	the privacy of the family and the child are protected and my organisation is aligned to the GDPR requirements.	15

3 Conceptual Architecture

The conceptual architecture depicts a decomposition of the system in individual components without delving deep into implementation and technical details. Except for components, the relationships among them and architectural mechanisms can also be included, thus providing an illustrative representation of all requirements as expected to be embodied through the system. The required abstraction facilitates discovery of any design failures and constraints right from the beginning of the implementation process. Besides that, a modular presentation of the system with individual components, is by nature in line with the core principles of agile development, enabling continuous integration and deployment.

The system architecture evolved and will keep evolving based on an agile-inspired methodology. Having as input the outcomes of WP2, which set the methodological foundations on three of the most important ChildRescue aspects -profiling, multi-source analytics, privacy and anonymisation- the initial approach of the high-level architecture was adapted and differentiated from the one presented in DOA. The updated user stories also provided valuable guidance in order to design an as complete as possible architecture. Some of the components have been renamed to better reflect their functionality, while some of the main internal subcomponents have been redistributed among components. The functionalities of every component were identified along with expected input and output. Based on all this work, the technical architecture goes one step deeper into defining the relations among the components and proposing some technical elements that should be used in the development. Lastly, the ChildRescue components are prioritised based on the MoSCoW method [2]. The current architecture provides a guideline for the platform implementation. It should be noted, that it could be gradually refined during the project, as decisions on implementation details will be continuously made and unexpected problems will be encountered.

3.1 Functional View

The high-level view of ChildRescue Architecture is presented as components distributed in three layers: **Data Access, Logic, Presentation Layer**. The main subcomponents of each component are also depicted in this view.

The diagram of the functional architecture is included in Figure 3-1

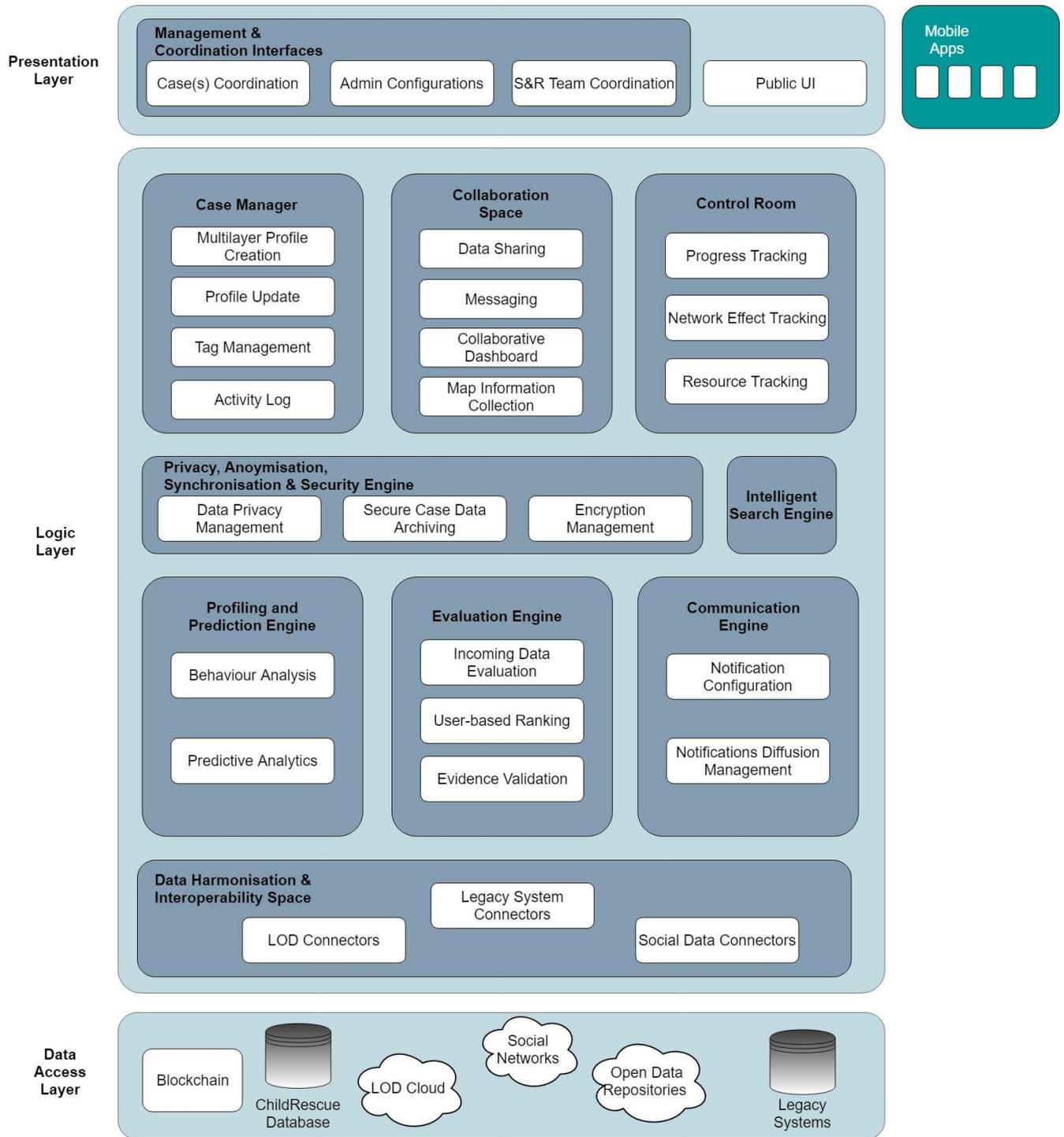


Figure 3-1 - High Level Architecture Diagram

The Data Access Layer comprises of all entities regarding data, that will be used in ChildRescue as storages or as sources: **ChildRescue Database**, the **Open/LOD Data Cloud**, **Social Networks**, **Legacy Systems** of the organisations and the **Blockchain**.

The Logic Layer contains the components that perform the basic functionalities of ChildRescue. The **Data Harmonisation & Interoperability Space** is responsible for the appropriate transformation of external data in a form suitable for the ChildRescue components. The **Communication Engine**

component will serve as the information conductor provided to the organisational roles of ChildRescue (Case Manager, Facility manager etc.), in order to communicate with the rest of the platform users, through configurable notifications. The **Evaluation Engine** will carry out the evaluation of the incoming evidence, in order to address more effectively cases of spamming or malicious usage. The **Profiling and Prediction Engine** lies at the core of the ChildRescue project, as it performs the behaviour and predictive analytics, which will produce valuable suggestions on possible POIs and routes. The **Privacy, Anonymisation, Synchronisation & Security Engine** will ensure that all communication between the users and the system will be conducted in a safe and secure way. This component also guarantees protection of the identity of users and of children with personal data stored in the platform. The **Intelligent Search Engine** component will be responsible for serving complex search queries and performing fuzzy matching, in order to provide other components with essential input for their analytics (for example, with matching old cases). The **Case Manager** component holds all actions regarding the management of a case/child profile: creation, update, activity monitoring. All coordination and collaboration among volunteer/rescue teams will happen through the **Collaboration Space** component, which will provide multiple cooperation tools to the users with access. The **Control Room** will be the monitoring module, performing data analytics to provide an overview of progress to users with managerial/organisational roles, so that they can better organise their next actions.

The Presentation Layer holds the interfaces of ChildRescue, providing all required tools and visualisations to make interaction with the platform as simple as possible, without cutting down on important information. Case coordination, administrative configuration, team coordination and user interfaces, are all included in this layer.

3.2 Technical View

The technical view of the conceptual architecture provides a more in-depth representation of the technical aspects of ChildRescue. More specifically, it focuses on how the ChildRescue components will be integrated in order to realise the ChildRescue vision. The technical view of the ChildRescue conceptual architecture is depicted in the following figure (Figure 3-2).

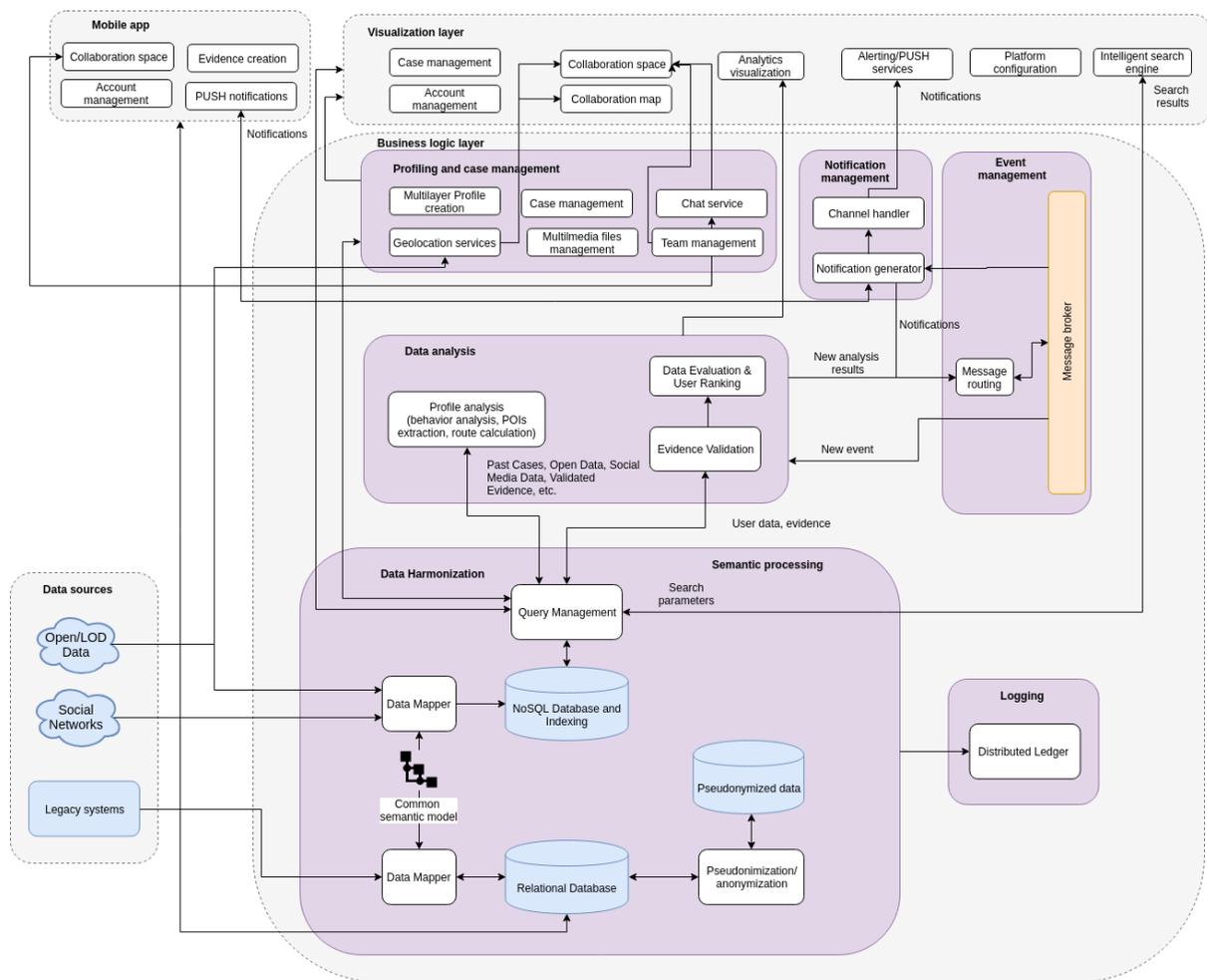


Figure 3-2 - ChildRescue Technical Architecture

The technical architecture of the ChildRescue Platform is divided in three main layers, the **Data Layer**, the **Business Logic Layer** and the **Visualisation Layer**, in correspondence to the conceptual architecture, which is divided in the Data Access Layer, the Logic Layer and the Presentation Layer respectively. It should be noted that the components that are highlighted with blue colour are part of the Data Layer, while the other two layers are highlighted with dotted boxes.

The Data Layer consists of the various **data sources** that are used by the ChildRescue Platform, as well as, the **data storage** components which store data from external sources and data that are generated within the platform. The data sources include various open data, social networks, LOD resources as well as the legacy systems of the various organisations which will integrate and provide data to the ChildRescue Platform. The data storage components consist of the **Relational Database**, the **NoSQL Database**, which is used for indexing, and the database with the **pseudonymised data**.

The Business Logic Layer includes the following phases:

- **Data Harmonisation:** Implements data harmonisation, data anonymisation, data access and semantic search
- **Data Analysis:** Implements the data analysis procedure
- **Logging:** Implements all the logging processes using blockchain technology

- **Profiling and Case Management:** Implements the backend of all services provided to the end user concerning the profiling and the case management
- **Notification management:** Implements the notification mechanism of the platform
- **Event management:** Implements the event management mechanism of the platform

The Visualisation Layer is responsible for constructing the UI in order to provide the results of the Business Logic Layer to the end user and support the interaction of the various user roles with the backend platform.

The various data sources are accessed and/or imported into the platform, either at design time or at runtime, through the **Data Mapper** component which is responsible for the ETL process [1] of the data using the **Common Semantic Model**. The Common Semantic Model is a conceptualisation of the ChildRescue entities and their relationships, implemented into a data model used for the transformation and harmonisation of the data at semantic and structural level. The data are stored into a NoSQL and a relational database. All data stored into the NoSQL database are accessed by the **Query management** component. The Query management component implements a search mechanism using the **Elasticsearch**², a search engine based on the Lucene library which queries the data. The component also implements an API which is responsible to transform any operation on the data from the other components to the relevant query that can be handled by the search mechanism. The personal user data, as well as, the critical information from the case data that need pseudonymisation are stored into the relational database. These data are pseudonymised and/or anonymised through the Pseudonymisation/Anonymisation component which will be implemented using the **ARX Framework**³ and stored in the Pseudonymised data database. More details about the technical implementation of this component is provided in Section 5.

Profile analysis is implemented using a set of ML algorithms for behaviour analysis and pattern matching in order to cluster/classify similar cases, identify possible routes and destinations of the missing children or unaccompanied minors etc. **Evidence validation** aims to validate the credibility of the user feedback. It is also implemented using ML techniques, based on the closeness of the evidence collected from the user feedback, to the location of the case under investigation. When the actual value of the evidence is known – for example on closure of a case-, the related users' credibility may be adjusted. This procedure aims to contribute at evaluating the content of the uploaded information, not the individuals themselves. To this end, pseudonymised data are going to be used in order to implement this data analysis processing.

The results of the data analysis are either stored in the data layer, either provided to the end user through the Analytics visualisation component, or used by the **Multilayer Profile creation**, which implements an additional processing layer in order to construct a complete profile of a missing child providing additional psychological information, information extracted from the social media, related and similar cases, possible destinations of the child and behavioural analysis results. The **Case management** component relates the multi-layered profile with a case and provides additional functionalities for case management (CRUD operations, generation of Amber Alert notifications or simple notifications of missing children, validation of evidence etc.). For each case, a relevant

² <https://www.elastic.co/>

³ <https://arx.deidentifier.org/>

collaboration space is possible to be created in order to support the various activities that need to be taken in order to resolve a case. These activities may include real-time investigation on the field implemented by specialised organisation members and volunteers or other activities such as flyer distribution in specific areas. To this end, the Profiling and case management phase includes the Team management component which implements all the aforementioned functionalities. A **Chat service** component as well as a **Geolocation services** component complement the functionalities of the Team management by providing the relevant chat rooms and map functionalities of the collaboration space. All the components of the Profiling and case management phase receive, provide and update data from the Data as well as the Visualisation Layer, through the Query Manager,.

The Business Logic Layer also provides the Notification management phase which generates notifications and routes them as push notifications through the **Notification generator** and the **Channel handler** components, respectively. The Notification generator creates notifications for the end users for new personal messages or messages in chat, new missing child notifications or amber alerts in the current area of the user, new results from the Data Analysis phase, new task allocation or response of a volunteer to a specific task assignment, invitation to join a rescue team, response of participation in a rescue team etc. Apart from the notifications which aim to support the users in their activities, there are also the system events notifications which are handled by the **Event management** component and aim at the smooth integration of the components and the proper functionality of the Platform. The Event management component implements a Pub/Sub mechanism and a **Message router**. All the components of the platform are subscribed in order to receive internal messages and proceed with any foreseen processing operations. Whenever they have an event that needs to be shared with other components, they provide it to the Message Router which routes it to the right topic/queue for consumption. These messages may include new results deriving from the Data Analysis phase, data updates in the database which may trigger other operations in the rest of the components, creation of new collaboration space for specific case etc. The Event management component provides an event-driven, asynchronous and reliable communication of the components.

The UI is organised in specific sections, each one offering a set of functionalities to the end user depending on their role. The sections include: account management, case management, collaboration space, analytics visualisation, push notifications and alerting, intelligent search engine and platform configuration.

The ChildRescue Platform also provides technical integration with the mobile app. This is implemented through push notifications for user alerting, and a REST API for account management, the collaboration space and evidence creation. More details on the integration of the mobile app is provided in Section 4.4. The design and the specification of the mobile app will be provided in D3.3.

3.3 ChildRescue Components

In this section we will analyse the components constituting ChildRescue both from the aspect of functionality as well as structurally. Afterwards, we will attempt to perform a prioritisation of the components, that will indicate the development order timewise.

3.3.1 Functionalities per Component

Going one step deeper into describing the operation of every component, in the following table (Table 3-1), every ChildRescue component is matched to a set of functions. These functions will be further

explained in this section, in order to clearly define the input and output of ever component and all procedures that will take place within it.

Table 3-1 - Overview of ChildRescue Components' Functionalities

ChildRescue Components	Sub-Components	Functionalities
Data Harmonisation & Interoperability Space	Open/LOD Connectors	Connecting to external APIs
	Legacy System Connectors	Data Ingestion
	Social Data Connectors	Data Cleansing & Transformation
		Data Storage
Case Manager	Multilayer Profile Creation	Multilayer Case Profile Generation
	Profile Update	Ongoing Data Acquisition
		Profile Enrichment
	Tag Management	Tag Retrieval from Collaboration Space
		Case Tagging
	Activity Log	Actions Logging
Profiling and Prediction Engine	Behaviour Analysis	Case-Child Profile Modelling
		Social Media Analytics
		Initial POIs Extraction
	Predictive Analytics	Multiple-source Data Aggregation
		Potential POIs Extraction
		Route Estimation
Evaluation Engine	Incoming Data Evaluation	Evidence Content Evaluation
	User-based Ranking	User-based Evaluation
	Evidence Validation	Crowdsourced Evidence Validation
Privacy, Anonymisation, Synchronisation & Security Engine	Data Privacy Management	User Pseudonym Creation
		Case and User Data Pseudonymisation
	Secure Case Data Archiving	Semantic Annotation of Closed Case
		Aggregated Case Data Generation
		Analytics and Statistics Generation
		Removal of Case Data from Users' Mobile Devices
	Encryption Management	PKI Encryption for Communication

		Case Data Encryption
		One-way User Password Credentials Encryption
Intelligent Search Engine	Intelligent Search Engine	Index structured and unstructured data
		Fuzzy String Matching
		Parameterised Search
Collaboration Space	Data Sharing	Top-Down Sharing of Multimedia Files
		Top-Down Sharing of Textual Data
	Messaging	Direct Messaging Engine
		Chat Rooms Engine
	Collaborative Dashboard	Case Tagging from Experts
		Announcements Posting
	Map Information Collection	API Connection
		S&R/Volunteer Team Members Geolocation Tracking
Control Room	Progress Tracking	Data Processing
	Network Effect Tracking	Data Analysis
	Resource Tracking	Visualisation
Communication Engine	Notification Configuration	Notification Content Management
		Duration Configuration
	Notifications Diffusion Management	Receivers Filtering
		API Connection
		Location of Diffusion Configuration
Blockchain	Blockchain	Record Preparation
		Data Recording

We proceed with the extended description of every component's functionalities. They are presented in a separate table per component.

Table 3-2 - Data Harmonisation & Interoperability Space Functionalities

Input	Social Media Data Open/Linked Open Data Data from Organisations' Legacy Systems
--------------	---

Functionalities		The Data Harmonisation & Interoperability Space shall...
	Connecting to external APIs	be able to connect through APIs to external systems.
	Data Ingestion	allow for data acquisition from the social media, LOD cloud, open data repositories and existing legacy systems, according to specified data access policies. The data model which will be followed for the cases consists of the Case Profile, Child Profile and Events Details.
	Data Cleansing & Transformation	process the acquired data in order to provide input of the appropriate format to the ChildRescue Engines, following a common semantics model.
	Data Storage	provide the functionality of persisting data on the ChildRescue Database.
Output		Data from external systems in the appropriate format for ChildRescue

Table 3-3 – Case Manager Functionalities

Input		Data from Registration Forms Child's Activity Profile Data for a new Event Details Record
Functionalities		The Case Manager Component shall...
	Multilayer Case Profile Generation	create a multilayer case profile, based on the outcomes of D2.1. These include: runaways, abductions by third persons, international parental abductions and missing unaccompanied migrant minors, lost, injured or otherwise missing children.
	Ongoing Data Acquisition	receive data about the case throughout the case's life-time. It could be either manually registered information from the system operator, or the outcomes of the other ChildRescue engines.
	Profile Enrichment	update the case profile with any new information, without deleting old records, even when proved false.
	Tag Retrieval from Collaboration Space	acquire the tags that were selected for the case by the experts in the collaboration space.
	Case Tagging	attach the tags to the case record, for better search and categorisation purposes.
	Actions Logging	keep track of all changes on the case profile.
Output		Multilayer Case Profile

Table 3-4 - Profiling and Prediction Engine Functionalities

Input		Multilayer Case Profile Processed Social Media Data, Open/Linked Open Data Processed Legacy Systems Data Algorithms
Functionalities		The Profiling and Prediction Engine Component shall...
	Case Profile Modelling	match the case profile to a case category using clustering, classification or correlation analysis.
	Social Media Analytics	enrich the available information with the outcomes of social media-based personality prediction and behavioural analysis algorithms. The analysis can be performed taking as input the number of likes, past visited locations, friends etc.
	Initial POIs Extraction	create the child's activity profile as a result of the previous analysis. It may contain, depending on the completeness of available information, the favourite venues/places of the child, hobbies, not so obvious everyday patterns, events of interest etc.
	Multiple-source Data Aggregation	combine the generated activity profile, open and linked open data to produce estimations.
	Potential POIs Extraction	correlate the activity profile to open data such as the events happening nearby, to deduce potential points of interest.
	Route Estimation	estimate possible routes to the extracted POIs by integrating external information, such as transportation data, weather data.
Output		Child's Activity Profile Potential POIs Routes (centre and radius)

Table 3-5 - Evaluation Engine Functionalities

Input		User Profile and History Data Incoming Data from Mobile Apps
Functionalities		The Evaluation Engine Component shall...
	Evidence Content Evaluation	detect contradictory elements within submitted evidence, either in the actual content, or through cross-checking with the metadata (geolocation, timestamp). Anomaly detection is a possible approach for this process. The

		evaluation score of the evidence is adjusted according to the findings.
	User-based Evaluation	adjust the evaluation score of the evidence to the user's credibility factor. This credibility factor is calculated from past useful contribution of the user, her/his role in ChildRescue etc.
	Crowdsourcing Validation	perform an indirect crowd sourced validation through clustering of submitted evidence. Text analysis and proximity factors could be utilised to find similarity. The evaluation score of the evidence is adjusted accordingly.
Output		Data for a new Event Details Record

Table 3-6 - Privacy, Anonymisation, Synchronisation & Security Engine Functionalities

Input		
Functionalities		The Privacy, Anonymisation, Synchronisation & Security Engine Component shall...
	User Pseudonym Creation	create a realistic pseudonym for users who don't want their real identity to be visible to the ChildRescue community. However, it will be possible for administrative roles to see the registered information of the user.
	Case and User Data Pseudonymisation	perform pseudonymisation of all sensitive personal case and user data, using a combination of techniques. The pseudonymised data is stored in an accessible database, whilst the re-identification data will be kept separately with strict access restrictions. It is a reversible operation and re-identification of data can happen when needed, for example when a user's email needs to be verified. In case of a consent revoke, anonymisation can be performed by deleting the re-identification data.
	Semantic Annotation of Closed Case	attach additional information on the case upon closure, for better classification, search etc.
	Aggregated Case Data Generation	perform data aggregation and generate data cubes. The parameters of the aggregation can be defined by the operator.
	Analytics and Statistics Generation	perform a statistical analysis on the aggregated data.
	Removal of Case Data from Users' Mobile Devices	on closure of a case all case data will be removed from the users' devices and will no longer be accessible.
	PKI Encryption for Communication	use a typical Public Key Infrastructure that will ensure that certificates shared between parties are trusted and apply common cryptographic protocols to ensure that data are transmitted securely.

	Case Data Encryption	use encryption when storing case data. Data for which anonymisation is required from the start, will be encrypted using a one-way algorithm, namely the Secure Hash Algorithm (SHA). Pseudonymised data on the other hand will be stored by using a public key algorithm, namely the RSA.
	One-way User Password Credentials Encryption	ensure that no information regarding user password credentials is stored unencrypted, through a one-way encryption procedure.
Output		Pseudonymised/ Anonymised Data

Table 3-7 - Intelligent Search Engine Functionalities

Input		Data from ChildRescue Database Pseudonymised Data Search Parameters
Functionalities		The Intelligent Search Engine Component shall...
	Index structured and unstructured data	ingest data into a search index for faster queries.
	Fuzzy String Matching	perform approximate string matching in order to overcome orthographic differences in registration of the same name from different operators.
	Parameterised Search	allow the execution of more complex data queries, for example containing value ranges. This is useful for performing data analytics afterwards.
Output		Search Results

Table 3-8 - Collaboration Space Functionalities

Input		User Profile Data Multilayer Case Profile
Functionalities		The Collaboration Space Component shall...
	Top-Down Sharing of Multimedia Files	support one-way sharing of combined forms of data (text, audio, image, animation, video, interactive content).
	Top-Down Sharing of Textual Data	support one-way sharing of text.
	Direct Messaging Engine	provide direct exchange of messages among the privileged users who participate in the collaboration space.
	Chat Rooms Engine	support multiple chat rooms creation and selection of participants.

	Case Tagging from Experts	provide a pool of options (e.g. in a drop-down list) that can be selected in order to tag a case manually, thus allowing better classification and matching with similar old cases.
	Announcements Posting	support one-way posts, which are visible to all participants, for privileged users.
	Task Assignment	provide the functionality of top-down task assignment and keeping track of these tasks.
	API Connection	communicate with external sources through a geolocation API
	S&R/Volunteer Team Members Geolocation Tracking	allow for real-time tracking of operating teams.
Output		Case Tags Geolocation Data Assigned Tasks Data

Table 3-9 - Control Room Functionalities

Input		Geolocation Data Assigned Tasks Data Search Results Communication Engine Data
Functionalities		The Control Room Component shall...
	Data Processing	process all required data in order to provide input of the requested format to the analytics for the tracking of progress, network effect and resources.
	Data Analysis	explore and combine data from the ChildRescue database, the communication space, legacy systems in order to extract knowledge.
	Visualisation	expose the results of the analysis to the users through appropriate visualisations (line/pie/bar, timeline, geographical charts).
Output		UI ready visualisations Statistical Data

Table 3-10 - Communication Engine Functionalities

Input		User Profile Data Geolocation Data
--------------	--	---------------------------------------

		Multilayer Case Profile Profiling and Prediction Engine Output
Functionalities		The Communication Engine Component shall...
	Notification Content Management	provide the user with multiple options to edit the content of the notification (e.g. direct data retrieval from the amber alert system, manually add free-text, attach files), as the system will support different kinds of notifications to different users.
	Duration Configuration	allow the user to fix the timeframe for which the notification will be active.
	Receivers Filtering	allow the user define who shall receive the notification. It could be from the selection of distinct users, to application of user group filtering.
	API Connection	communicate with external sources through a geolocation API in order to provide the map visualisation.
	Location of Diffusion Configuration	allow the user define the centre and range of notification diffusion.
Output		Configurated Notifications

Table 3-11 – Blockchain Functionalities

Input		User Profile Data Data submitted through Mobile Apps
Functionalities		The Communication Engine Component shall...
	Record Preparation	prepare the data to be stored in the blockchain ledger. Just the id, a timestamp and the user are kept.
	Data Recording	the data is committed to the ChildRescue blockchain ledger which will consist of three nodes (one for each pilot).
Output		Blockchain Record

3.3.2 Structure of ChildRescue Components

In this section, we provide a zoom-in view of the ChildRescue components in the context of the technical view of the conceptual architecture. To this end, we use UML component diagrams in order to show the structural relationships between the ChildRescue components according to their defined functionalities. UML component diagrams offer a natural format to begin modelling a solution in order to verify that system's functionalities are being implemented by components. In addition, UML

component diagrams are useful communication tools for various groups, since they present an early understanding of the overall system as well as the logical software components⁴.

Figure 3-3 presents the "Data Harmonisation and Interoperability space" component of the conceptual architecture. "DataSourceConnector" connects to the various data sources, access and extracts the data which are provided to the "DataMapper". "DataMapper" is responsible to process (data cleansing and validation) all the incoming data and map them to a specific data schema based on the Semantic data model, in order to achieve data harmonisation. The results of the "DataMapper" are stored into a NoSQL database as documents in order to be retrieved by the QueryManager for consumption from the rest of the components through an implemented API, the "IDataQuery".

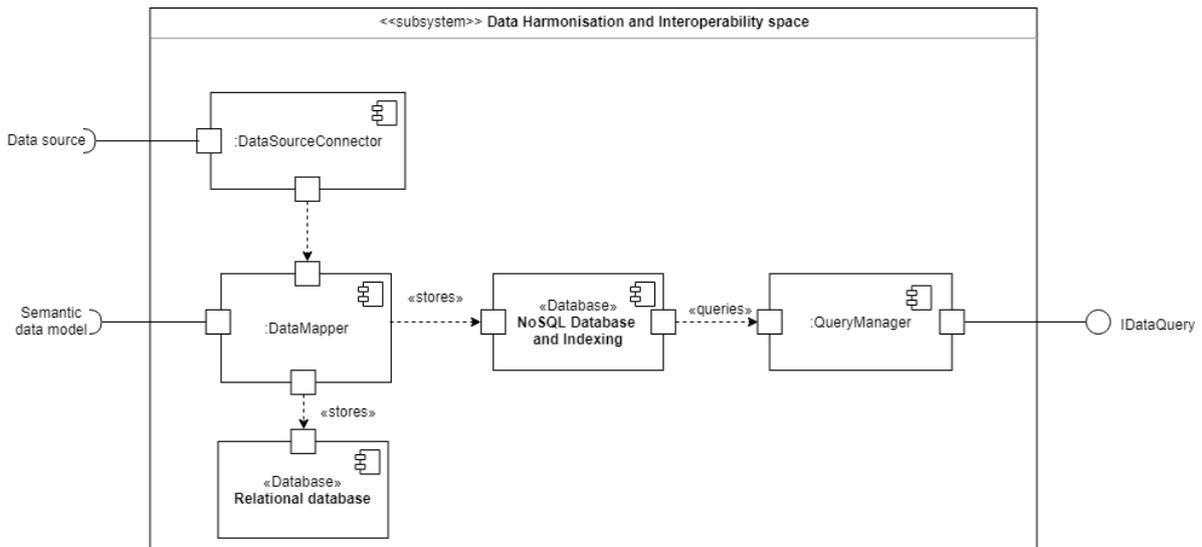


Figure 3-3 UML component diagram for Data Harmonisation & Interoperability Space

The "Profiling and Prediction Engine" as well as the "Evaluation Engine" are presented in Figure 3-4 and Figure 3-5 respectively. In both cases, the "DataCollector" component consumes data from the "Data Harmonisation and Interoperability space" through the IDataQuery interface. The output of the component is used by the "DataAnalysis" component which implements all the data analysis using ML algorithms, as described in the previous section. "Profiling and Prediction Engine" provides two interfaces the IBehaviourAnalysis and IPredictions in order to provide the results of behaviour analysis and possible destinations of the child, respectively. "Evaluation Engine" also provides two interfaces, the IUserEvaluation and IEvidenceEvaluation, in order to provide the evaluation results of the provided evidence. These data may be used by the Profiling and Case management phase and by the Visualisation Layer for direct representation to the user. Otherwise, the results may be stored into the "Data Harmonisation and Interoperability space" using the IDataQuery interface.

⁴ <https://www.ibm.com/developerworks/rational/library/dec04/bell/indets x.html>

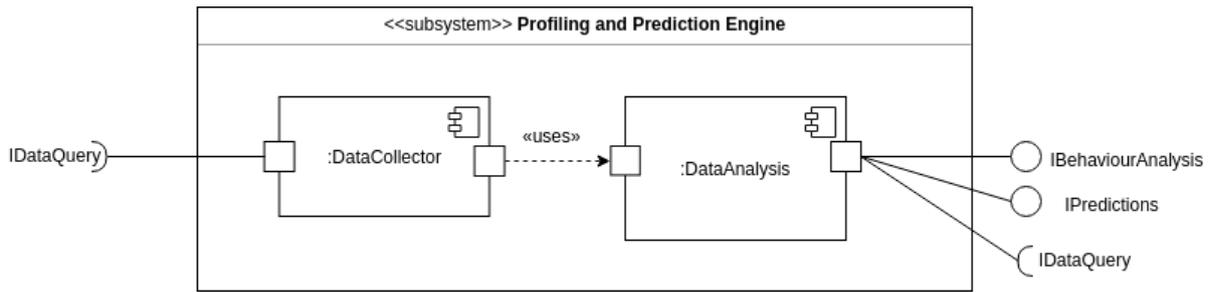


Figure 3-4 UML component diagram for Profiling and Prediction Engine

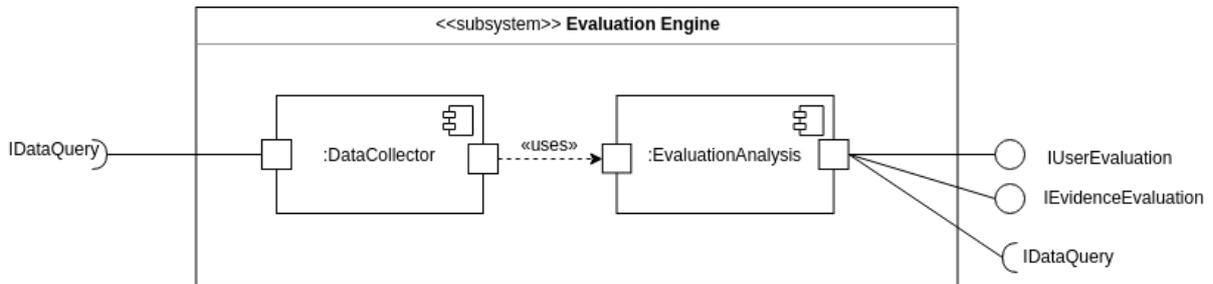


Figure 3-5 UML component diagram for Evaluation Engine

The "Communication Engine" is provided in Figure 3-6. The "NotificationsGenerator" is responsible to create new notifications based on information deriving from the "Data Harmonisation and Interoperability space" through the IDataQuery interface and the "MessageBroker" through a Pub/Sub mechanism. As soon as a notification is generated, it is forwarded to the "NotificationsDiffutionsManager" which routes the notification message through a Web socket as a push notification in order to be presented to the end user, or/and sent to the "MessageRouter" in order to be routed to the right topic/queue for internal consumption from the rest components.

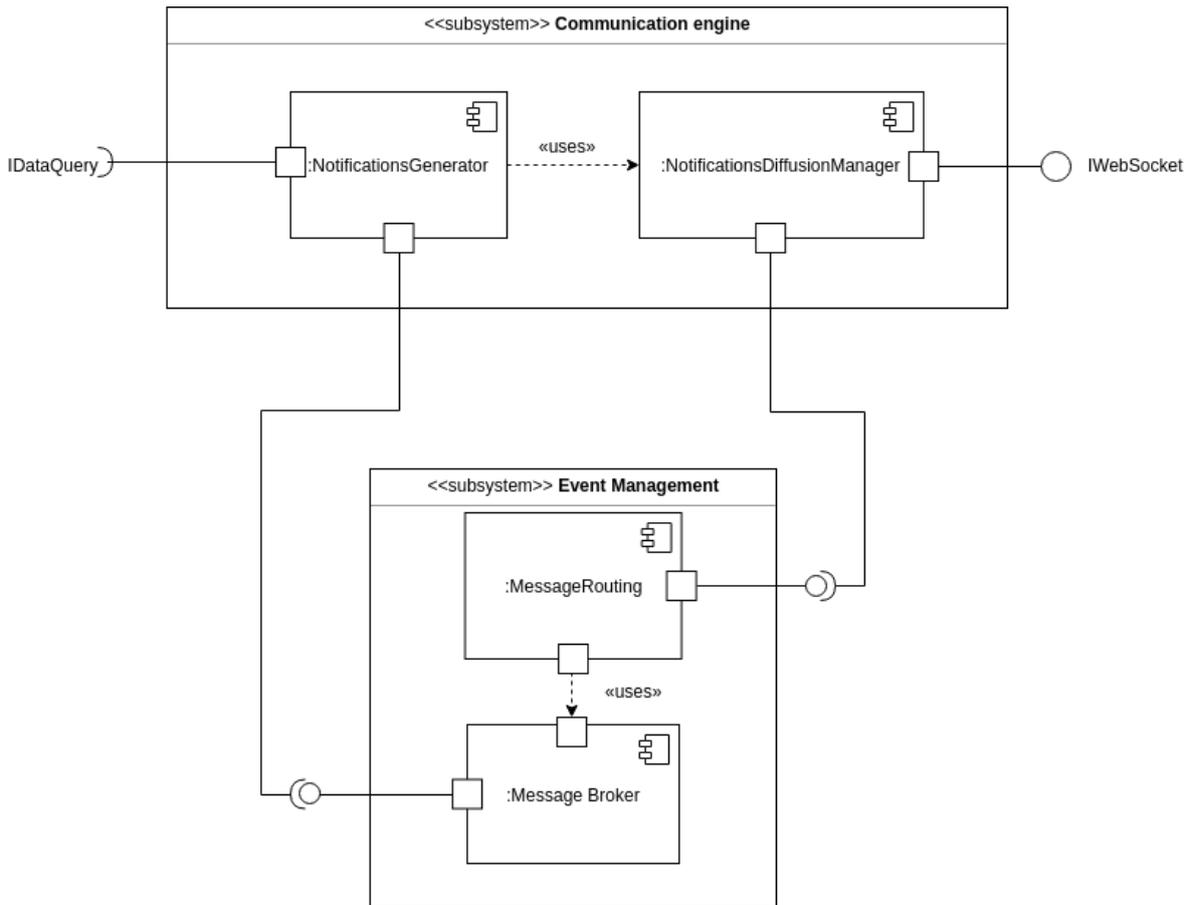


Figure 3-6 UML component diagram for Communication Engine

The “Case Manager” is provided in Figure 3-7. The “MultilayerProfileCreator” component in the core component of the subsystem. It constructs the multilayer profile of the child as well as the relevant case by collecting information from various sources: the “DataCollector” component, which collects profile data from the “Data Harmonisation and Interoperability space” using the IDataQuery interface, the “Profiling and Prediction Engine” subsystem through the IPredictions and IBehaviour interfaces, the “Evaluation Engine” though the IUserEvaluation and IEvidenceEvaluation interface. The component offers the IProfileManagement and the ICaseManagement interfaces for the management of the profile and the case, respectively.

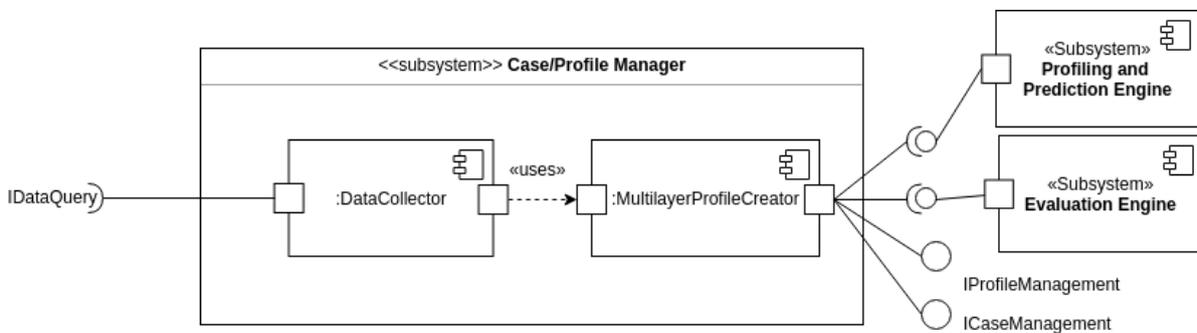


Figure 3-7 UML component diagram for Case Manager

The "Collaboration Space" is provided in Figure 3-8. "CollaborativeDashboard" is the core component of the subsystem. It creates a collaborative dashboard using information from various sources: the "DataCollector" component, which collects profile data from the "Data Harmonisation and Interoperability space" using the IDataQuery interface, the "GeolocationService" which implements the map functionality for the dashboard using also the "OpenMaps" API, the "TeamManager" which implements all the CRUD operations for the rescue teams, the "ChatService" which implements the chatrooms using the "CommunicationEngine". The component offers the ICollaborativeDashboard interface for the management of the Collaboration Space from the Visualisation layer.

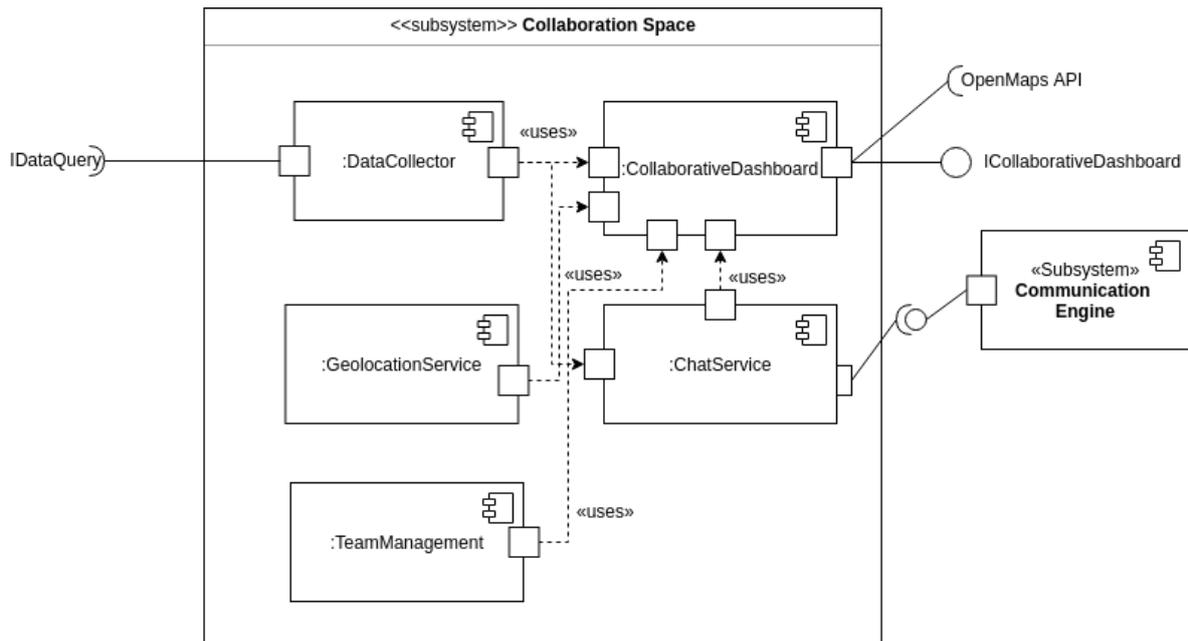


Figure 3-8 UML component diagram for Collaboration Space

The "Control Room" is provided in Figure 3-9. The "CollaborativeSpaceIntegrator" integrates the Collaboration space for the "Control Room". The "TrackingService" offers a set of tracking services using information from various sources: the "CollaborativeSpaceIntegrator" component, which collects data from the "Collaborative Space" using the ICollaborativeDashboard interface, the "GeolocationService" which implements the map functionality for the dashboard using also the "OpenMaps" API. The component offers the INetworkEffectTracking interface for the management of the network effect, the IResourceTracking for real-time resource management and the IProgressTracking for the management of the progress of the real-time investigation.

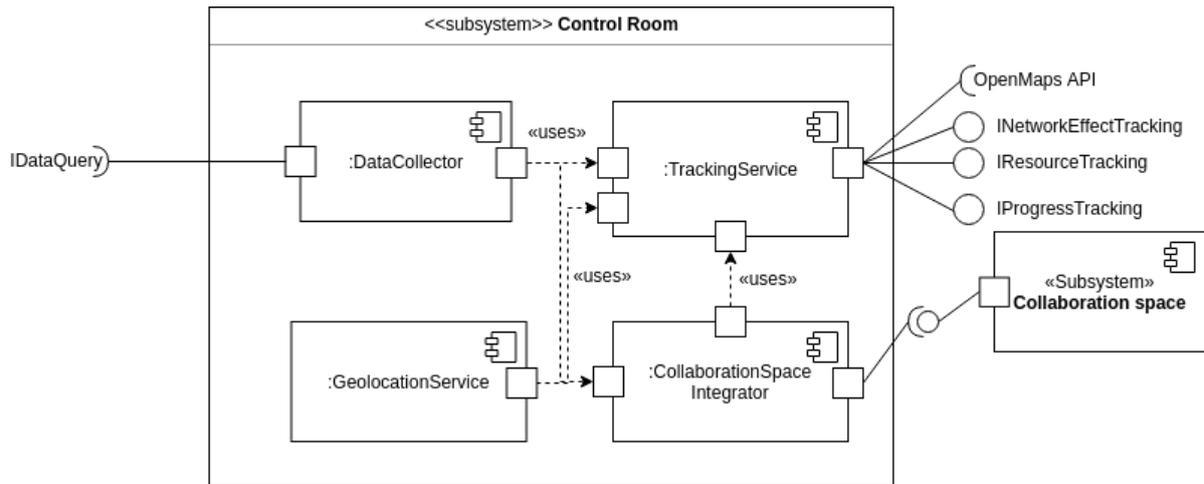


Figure 3-9 UML component diagram for Control Room

The "Management and Coordination Interfaces" is provided in Figure 3-10. The subsystem includes one core component which is responsible for the UI generation of a set of functionalities. These components are: the "CaseManagement", which provides the necessary UI for the case management using data from the "Case/Profile Manager" subsystem, the "Real-time coordination", which provides the necessary UI for the real-time coordination of rescue teams using data from the "Control Room" subsystem, the "Graph Generator", which provides the necessary UI for the visual representation using data from the "Case/Profile Manager" subsystem, the "Collaboration map", which provides the necessary UI for the real-time representation of resources and evidences on the map using data from the "Control Room" subsystem, and the "Alerting Services", which provides the necessary UI for the real-time notifications using data from the "Communication Engine" subsystem. All the aforementioned components also retrieve information from the "DataCollector" component, which collects profile data from the "Data Harmonisation and Interoperability space" using the IDataQuery interface.

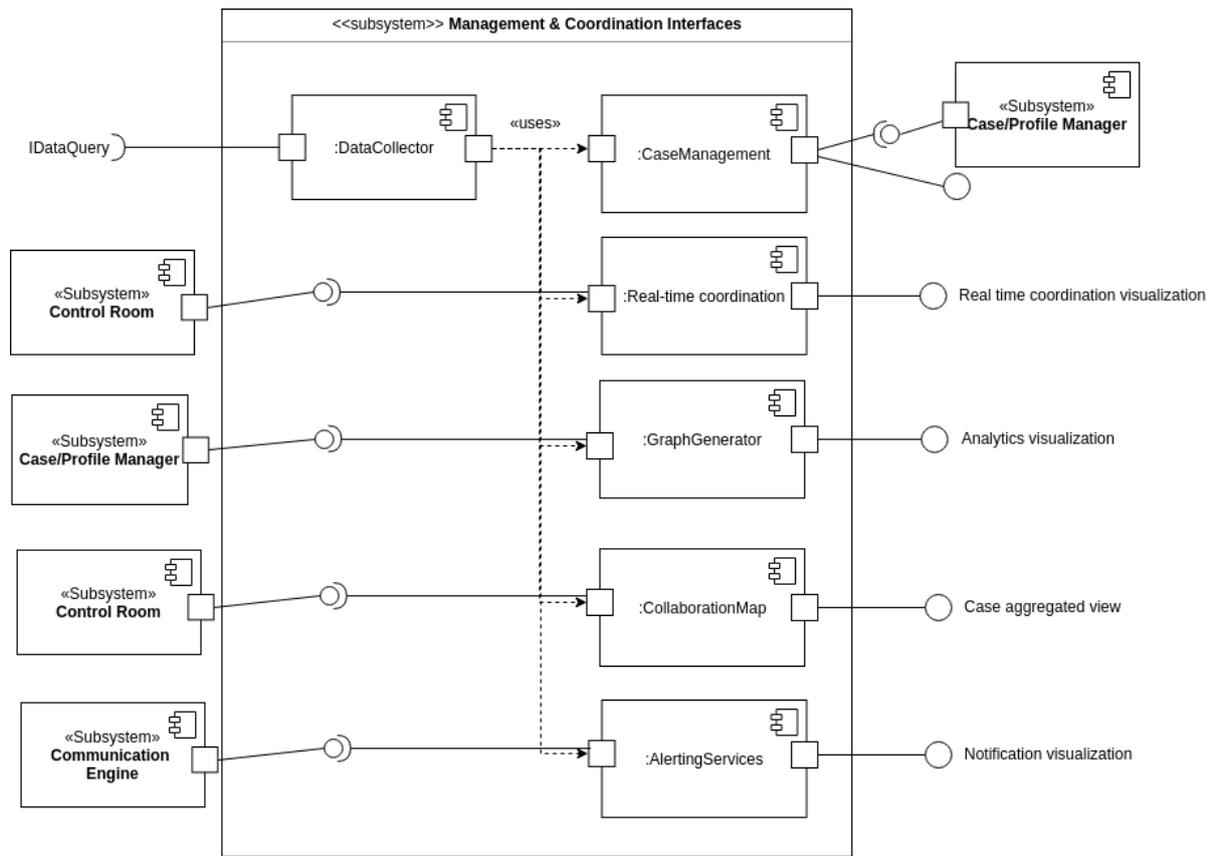


Figure 3-10 UML component diagram for Management and Coordination Services

3.3.3 Components Prioritisation

In a project with fixed time, like ChildRescue, it is vital to understand the relative importance of the components that compose the platform, in order to keep deadlines and deliver the most crucial features in time for the end-user. For this purpose, the MoSCoW⁵ prioritisation technique has been employed, which is presented in the following Table 3-12.

Table 3-12 - MoSCoW General Prioritisation Guidelines

MoSCoW Prioritisation Guide	
Priority	Guidelines
Must Have	<ul style="list-style-type: none"> No point in delivering on target date without this; if it were not delivered, there would be no point deploying the solution on the intended date Not legal without it Unsafe without it Cannot deliver a viable solution without it

⁵ The DSDM Agile Project Framework, MoSCoW Prioritisation : <https://www.agilebusiness.org/content/moscow-prioritisation>

Should have	<ul style="list-style-type: none"> • Important but not vital • May be painful to leave out, but the solution is still viable • May need some kind of workaround, e.g. management of expectations, some inefficiency, an existing solution, paperwork etc. The workaround may be just a temporary one
Could Have	<ul style="list-style-type: none"> • Wanted or desirable but less important • Less impact if left out (compared with a Should Have)
Won't Have this time	<ul style="list-style-type: none"> • It is agreed that this will not be delivered within this timeframe.

It should be noted that sometimes the distinction among the "Should Have" and "Could Have" priority levels can be indistinct. In this case, it would be useful to measure the degree of "pain" caused by not delivering this component and its features, in terms of end-user value. The user story pilot voting results can assist in this decision.

MoSCoW is a method that works well on projects and overcomes problems of other simpler approaches. The specific formulation (ex. "Won't have this time") indicates clearly what we expect of every particular item during the project. Different levels of prioritisation, with different scope, can be performed: the prioritisation of the components per platform release, or for the whole project. In our case, the prioritisation was performed on the sub-components that constitute every component and can be fairly independent to one another, and having in mind the whole project lifecycle. User stories were the main guideline in deciding the presented priority. Sub-components that implement the highly prioritised user stories, will be marked as a "Must Have". The first release of the platform, shall include as many as possible of the "Must Have" sub-components, while the "Should Have" are targeted for the second release, although this order is not strictly binding. Following are the prioritisation results (Table 3-13).

Table 3-13 - MoSCoW Prioritisation of ChildRescue Components

ChildRescue Components	Sub-Components	MoSCoW
Data Harmonisation & Interoperability Space	Open/LOD Connectors	Should Have
	Legacy System Connectors	Must Have
	Social Data Connectors	Could Have
Case Manager	Multilayer Profile Creation	Must Have
	Profile Update	Must Have
	Tag Management	Could Have
	Activity Log	Should Have
Profiling and Prediction Engine	Behaviour Analysis	Should Have
	Predictive Analytics	Should Have

Evaluation Engine	Incoming Data Evaluation	Should Have
	User-based Ranking	Could Have
	Evidence Validation	Could Have
Privacy, Anonymisation, Synchronisation & Security Engine	Data Privacy Management	Must Have
	Secure Case Data Archiving	Must Have
	Encryption Management	Must Have
Intelligent Search Engine	Intelligent Search Engine	Should Have
Collaboration Space	Data Sharing	Should Have
	Messaging	Must Have
	Collaborative Dashboard	Could Have
	Map Information Collection	Should Have
Control Room	Progress Tracking	Should Have
	Network Effect Tracking	Could Have
	Resource Tracking	Should Have
Communication Engine	Notification Configuration	Must Have
	Notifications Diffusion Management	Must Have
Blockchain	Blockchain	Should Have

4 Integration Approach

4.1 Technology Stack and Tools

For the creation of ChildRescue the following combination of languages, tools and frameworks are expected to be utilised. Some existing tools already implemented by the consortium partners in the context of other research or commercial projects are presented, due to their relevancy to ChildRescue and possible integration thereof. As with other aspects of the implementation design and process, the presented selection of technologies is not final and certainly not binding. Updates on the technology stack will be reported in parallel to the delivery of the two major platform releases.

-PostgreSQL

PostgreSQL is an open source object-relational database system, which uses and extends the SQL language, combined with features for safe storage and scalability. With more than 30 active years on the core platform, it is a mature and reliable system. It is chosen for the basic ChildRescue data warehouse, as it is free, open-source, conforms with the SQL standard, is highly extensible - ability to define new data types, build custom functions, write in different programming languages-, provides features for reliability and disaster recovery, security and a lot more.

-MongoDB

MongoDB is a free, open-source, non-relational database system. It stores data in flexible, JSON-like documents, meaning fields can vary from document to document and data structure can be changed over time. It supports ad hoc queries, indexing, and real time aggregation provide powerful ways to access and analyse data. Due to its distributed core, MongoDB offers high availability, horizontal scaling, and geographic distribution. It works well with Elasticsearch and will therefore be used in ChildRescue for big data acquired from third parties, such as open data.

-Elasticsearch

Elasticsearch is a distributed, RESTful search and analytics engine. It can perform really fast searches of various types -structured, unstructured, geo, metric- within the stored data, thus serving really diverse purposes, as for example application search, security analytics, metrics and logging. Elasticsearch is easily scalable, resilient, predictable, provides the ability to build clients in many languages. For all these reasons, it will be utilised in ChildRescue, as part of the PostgreSQL raw data will be imported into Elasticsearch for rapid search service.

-Celery

Celery is a simple, flexible and reliable distributed system for processing of vast amount of messages. It enables real-time processing and supports task scheduling. Several transport alternatives are supported (ex. RabbitMQ, Redis, Amazon SQS). Event-based monitoring is performed through tools such as Flower. It will be used as the intermediate link among the PostgreSQL and the Elasticsearch, and will drive the necessary synchronisation actions among them.

-Django Framework

Django is an open-source, high-level Python Web framework for fast, secure and scalable web development. It is designed to easily carry out the most common development tasks and leave time for the essential work. It offers a free API, a dynamic admin interface, different views, the ability to

design templates, a framework for RSS feeds creation, a caching framework and a lot more. It will serve as the ChildRescue web framework.

-Docker

Docker is a container platform that helps addressing compliance, security and operational needs. A container is a standard unit of software that packages up code and dependencies, thus making the application fast and reliable when migrating among different computing environments. Docker containers supported by the Docker Engine are: standard, lightweight or secure.

-Vue.js

Vue is a progressive, incrementally adoptable JavaScript framework for building user interfaces. Its core library is focused on the view layer, is easily pickable and integrates with other libraries and existing projects. It provides native rendering, robust routing solutions for large applications, flexible among a variety of build systems and significantly light weight. It will be employed for the creation of the ChildRescue web UI, as it offers a light solution, sufficing for the project's needs.

-ARX Framework

ARX is an open source tool for transforming structured (i.e. tabular) personal data using selected methods from the broad areas of data anonymisation and statistical disclosure control. It supports transforming datasets in ways that make sure that they adhere to user-specified privacy models and risk thresholds that mitigate attacks that may lead to privacy breaches. In ChildRescue it will be used for support of the pseudo-/anonymisation functions.

4.2 Integration Plan

The ChildRescue integration plan will follow a gradual approach, based on the results from both the user story and the components prioritisation, which were presented in the previous sections. Two major platform and mobile application releases are foreseen in the project, in [M18] and [M27], although minor intermediate releases will occur, as user feedback and pilot testing among releases are expected to lead to improved versions of the already integrated components.

In terms of user functionality, the first release will be ready to execute a complete process, including: registration of organisation and members, registration of independent users, creation and management of case and child profiles, reception of evidence from mobile app users, notification generation and diffusion. Preliminary work on the predictive and behaviour analytics is also planned for the first release, although it is not expected to reach the maturity to produce predictions and assist the investigations until [M18]. A prototype version of the direct messaging functionality shall be supported, although the fully functional messaging and cooperation system is planned for the second major release. Facility management will be partially provided through a first version of the digital absence record. All relevant user interfaces for the operation of the above described features, are foreseen within the first release. Necessary security and protection of personal data will be ensured, to the level required by the implemented functionalities.

The second release of ChildRescue in [M27], will integrate both the improved versions of components available from the first iteration, along with the functionalities that were scheduled for the second release. These include the various types of analytics – behaviour and predictive analytics, progress tracking and monitoring, evidence evaluation -, the field operation and team coordination support, the

blockchain implementation, case classification and intelligent search. User interfaces will display the analytics results and allow users to capitalise on all features. Fully functional direct messaging and chat room service will be supported, along with the incorporation of the automated facility management functionalities. Pseudonymisation, data aggregation and security will be performed, as described in section 5 of this deliverable.

After the second release and until the end of the project bug fixing will be performed, based on the testing and piloting results, but no more functionalities will be added.

4.3 Platform Integration Process

A progressive approach will be generally followed for the integration of the components and their functionalities to the ChildRescue platform. However, their integration will not be a once and for all, as the implementation process will be an iterative procedure, always refining, fixing and updating what has already been delivered.

The first step will be the definition, design and implementation of the core database structure in the PostgreSQL. We will proceed with the definition of the organisation entities, user roles and their authentication. As the whole set of functionalities will not be delivered from [M18], the first phase could include only directly involved actors and then be gradually enriched as new user requirements and stories are realised. The next step is the design and the implementation of restful APIs endpoints and of basic web user interfaces. Map services will be required from the first release, so geolocation integration will be the next step. They will be included, initially, for the notification configuration and later for the coordination/collaboration procedures. Afterwards, the integration of the real time messaging and notification generation technology will take place. The pseudonymisation/anonymisation module, data acquisition from parties outside the consortium -open/LOD data-, and performance of analytics through the Elasticsearch engine are the three last tasks of the integration process.

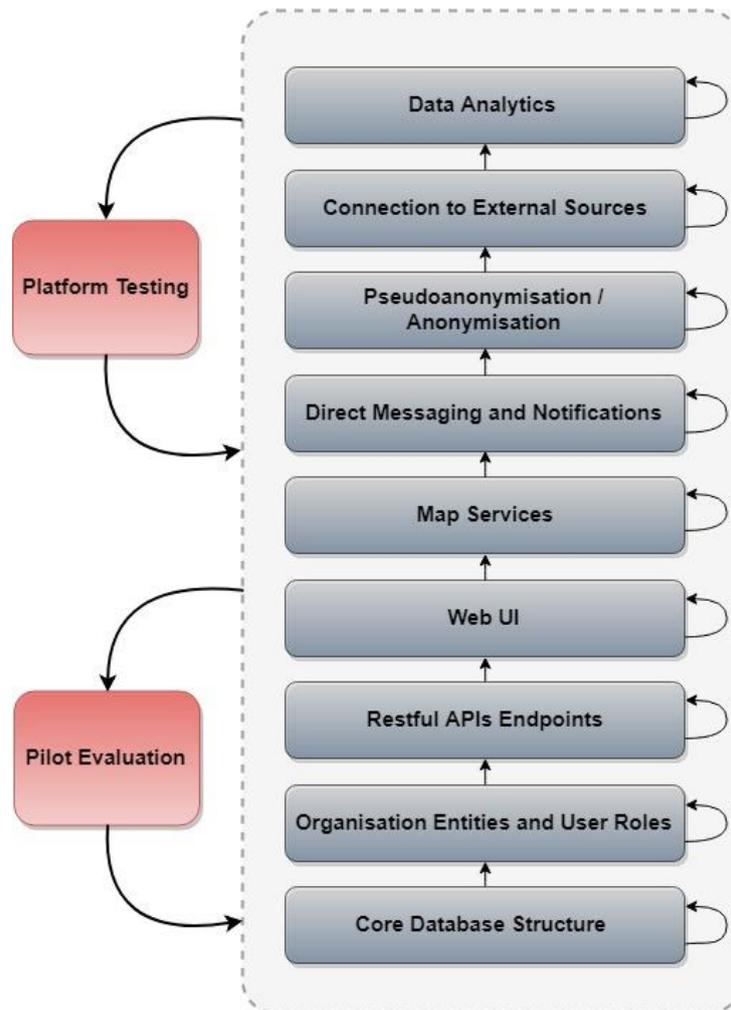


Figure 4-1 - Platform Integration Approach

4.4 Mobile App Integration

In terms of performance and delivery of the content and services, in the context of its integration with the server side, the mobile application aims to leverage an application service tier, which will differentiate the client side (mobile devices) and the server side (services and APIs). To this end, an intelligent and agile layer of application delivery services and APIs will be designed, that will mediate between clients and services to ensure that delivery needs (security, performance, and data availability) are met.

The scope of the application server will be the isolation of users from services and infrastructure by applying the appropriate policies in terms of security and performance, so as to facilitate the bilateral communication with the mobile application. This approach, which is depicted in Figure 4-2, will make the APIs and application services more scalable, which in turn will make the development and deployment process more efficient. In the context of ChildRescue, the mobile application will interact with several APIs in order to fulfil all the functional and technical requirements.

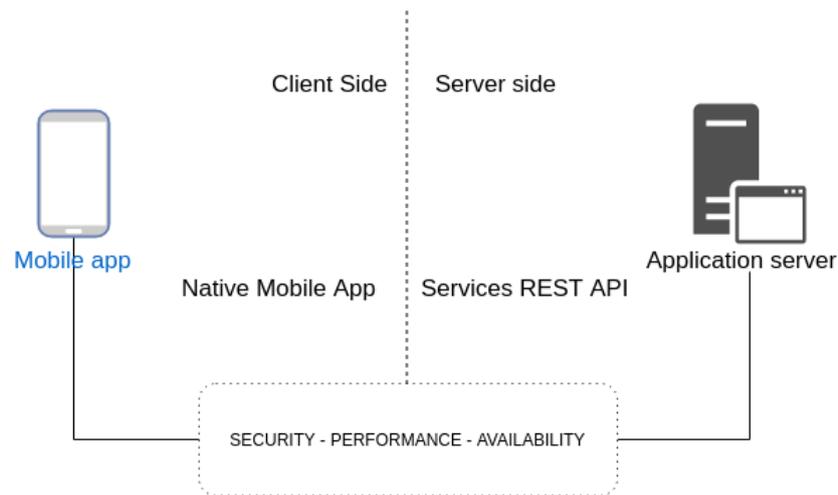


Figure 4-2 Mobile App Integration with the backend platform

Push notifications are one of the core mobile integration points of ChildRescue architecture. Figure 4-3 provides an overview of the high-level integration, denoting the actual process flow. A push notification is the delivery of information to a computing device from an application server where the request for the transaction is initiated by the server rather than by an explicit request from the client.

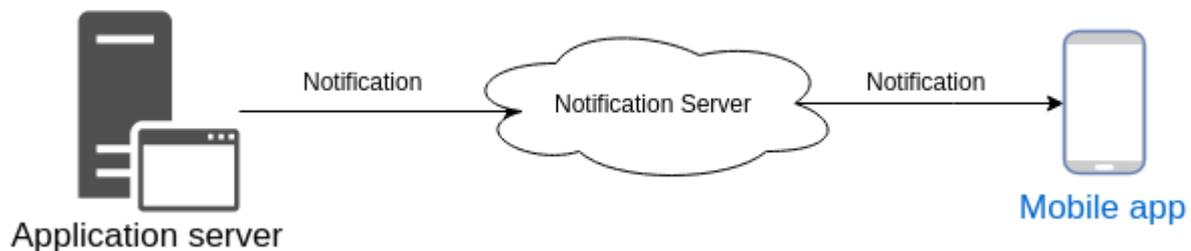


Figure 4-3: Mobile App Push Notification

Normally, there is no considerable difference between iOS and Android notifications, so the steps on how to incorporate push notification feature in an iOS app are similar to Android app and can be summarised as follows:

- Initially, Notification Server receives a token request from an iOS/Android device (Token is normally used as an address to get push notification).
- After that, an application server receives tokens from the iOS/Android device and send a push notification along with a token directly to Notification Server.
- Notification Server transmits a push notification directly to the iOS/Android user.

5 Security and Privacy

In order to assure security in the ChildRescue Platform in the level of communication, as well as, in the level of storage, **encryption** techniques will be applied.

Encryption of data refers to a set of techniques that can be used between two parties to exchange information in a secure and reliable way. This means that data exchanged between them are:

- **Encrypted:** No other party can make sense of the data unless the other party has possession of the private key needed to decipher the information.
- **Signed:** The identity of a sender can be verified in a way that the recipient is sure that the sender is who she/he claims to be. Upon receipt of the message, the sender cannot deny that the message originated by her/him and cannot claim that the contents of the message were others than those received by the receiver.

For the purposes of communication, ChildRescue will use a typical **Public Key Infrastructure**⁶ that will ensure that certificates shared between parties are trusted and will apply common cryptographic protocols to ensure that data are transmitted securely. The specifications of how a typical PKI is setup was given in Section 3.2.3 of D2.3; ChildRescue will use this setup. Since most of the traffic will be over the Web, the ChildRescue platform will be deployed under the **HTTPS** platform and appropriately verified certificates will be distributed to all client applications that need to connect.

Encryption will also be performed for ensuring that proper authorisation and authentication is performed for each user, without the danger of account hijacking. This encryption will take place on top of the usual traffic encryption and will ensure that no information regarding user password credentials is stored unencrypted. Since authentication of a user requires that the hash of the given password matches the hash of the stored password, no decryption is needed. A one-way encryption scheme for user passwords will thus be used.

Encryption will also be used when storing certain data. Data for which anonymisation is required from the start, will be encrypted using a one-way algorithm, namely the Secure Hash Algorithm (SHA). Pseudonymised data on the other hand will be stored by using a public key algorithm, namely the RSA. Since the key pair in the case of RSA is only needed for re-identification, this will be exclusively stored in the ChildRescue Platform, and when data expire it will be deleted. The procedure is depicted in Figure 5-1

⁶ A Public Key Infrastructure (PKI) is a set of roles, policies, and procedures needed to create, manage, distribute, use, store, and revoke digital certificates and manage public-key encryption. The purpose of a PKI is to facilitate the secure electronic transfer of information for a range of network activities such as e-commerce, internet banking and confidential email.

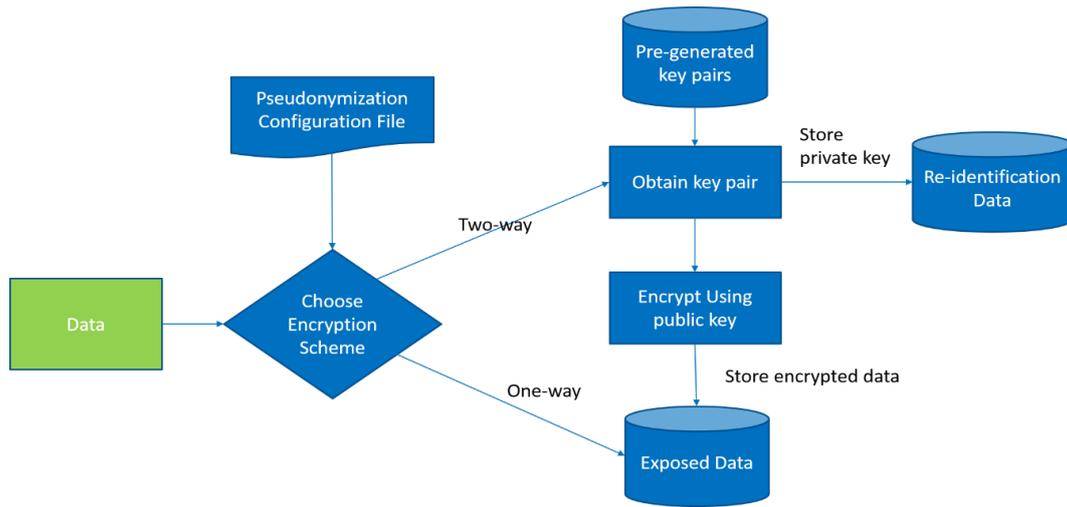


Figure 5-1 Encryption for Data Fields

ChildRescue platform will implement all privacy requirements through the Anonymisation component which is responsible for the pseudonymisation and anonymisation of the platform data, as also, depicted in the Data Harmonisation layer in the technical architecture of the platform. A number of approaches and techniques for pseudonymisation and anonymisation of the data have been presented in D2.3 and D2.4. In the following figure (Figure 5-2) we provide the architecture of the Anonymisation component.

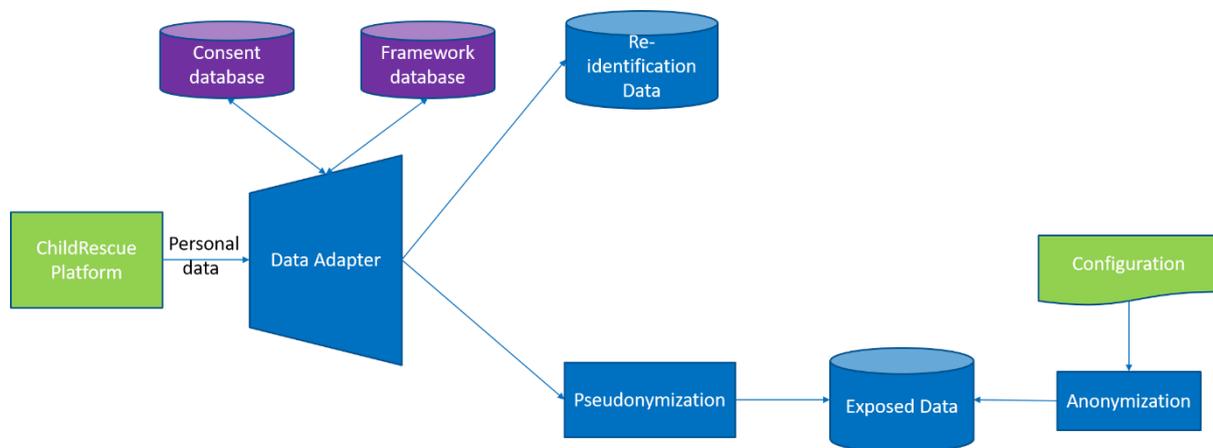


Figure 5-2 Architecture of the Anonymisation Component

The component includes the following sub-components:

Consent database: A database which stores the data subjects who have provided consent to the ChildRescue platform.

Framework database: A database which contains the PIIs of all the data subjects whose data disclosure is covered by the Regulatory Framework of D1.2.

Re-identification database: A database which contains the original data of the data subjects or other data which can be used to match the pseudonymised (or anonymised) data to the data subjects.

These data need to be pseudonymised (or anonymised) and their access is restricted only to the authorised personnel.

Exposed database: A database which contains the pseudonymised data which are accessed and disseminated to the various parties which use the ChildRescue platform.

Pseudonymisation: A component that will perform pseudonymisation transformations on the data.

Anonymisation: A component that will anonymise the data.

Data adapter: A software component which is responsible to implement the pseudonymisation of the data.

The pseudonymisation process is briefly described below:

When collecting personal data, the Data Adapter will query the Consent database and the Framework database. The consent database will have stored a map of all subjects that have provided consent to the ChildRescue platform. The Framework database will contain the PII's of all data subjects whose personal data disclosure is covered by the Regulatory Framework as it is described in D1.2 (e.g. a child for which a distinct attorney has provided permission to issue an amber alert). If confirmation from the consent or the framework database occurs, the Pseudonymisation Module will perform pseudonymisation on the data; it will store the pseudonymised data in an open dataset that can generally be accessed by parties being in communication with ChildRescue and will store the re-identification data in a separate database; the Re-identification database. The Re-identification database will not be publicly accessed but will be used and maintained by each of the data controller's explicitly trained personnel. When re-identification is needed at run-time (e.g. when the e-mail of a user needs to be verified), the Pseudonymisation Module will communicate with the Re-identification database to obtain the original data; apart from this case, access to the re-identification database will be restricted.

After storage, an extra *Anonymisation* module will provide the functionality of generating anonymised data from the exposed data set. The implementation of the anonymisation module will be based on the **ARX Framework**⁷ and will produce a data set with high *k-value*, *l-diversity* and *t-closeness* parameters. In case the platform operator imports a population table, the *Anonymisation* module will also produce a low value of δ (for the specifics of *k-value*, *l-diversity*, *t-closeness* and δ -difference, please consult Section 2.3.2.1 of D2.4). The anonymised data set will contain all useful information regarding user actions and cases and can still be used to compute analytics and provide useful feedback. Since data subjects cannot be de-identified from the anonymised data set, it can be stored or archived regardless of the status of consent forms.

In case that a subject is removed from the framework database or a consent is revoked, the Pseudonymisation Module will remove for this subject the re-identification data from the re-identification database. The pseudonymised data will be automatically converted to anonymous data upon this removal, so they can still be stored in the Exposed database. Upon revocation of consent, the deletion of re-identification data may take some time due to the system having to poll the consent database and the technical expert receiving the notification to delete re-identification data. This will be explicitly noted in the consent form.

⁷ <https://arx.deidentifier.org/>

The *Pseudonymisation* module will perform a combination of techniques as these were documented in Section 2 of D2.3. The administrator of the platform will be able to define which transformations are needed to ensure proper pseudonymisation or anonymisation.

The set of transformation offered will consist of both one-way hashes⁸ and two-way encryption (possibility to encrypt and decrypt the data) as well as all the data masking techniques, except from shuffling. The reason that shuffling is being excluded, is because it couples data of multiple subjects. If one subject revokes consent, it is difficult to undo the transformation without affecting data corresponding to other subjects.

⁸ A one-way hash function, also known as a message digest, fingerprint or compression function, is a mathematical function which takes a variable-length input string and converts it into a fixed-length binary sequence. Furthermore, a one-way hash function is designed in such a way that it is hard to reverse the process, that is, to find a string that hashes to a given value (hence the name one-way).

6 Conclusions

The user requirements and user stories have been compiled in T1.1, from an early stage of the project. This input is more accurately defined, as the continuous interaction with the pilots provides a clearer view of their existing processes and needs. T1.3 combined the two different use cases (missing child and unaccompanied migrant minor) and formalised the functionality of ChildRescue into workflows and dataflows. In the context of WP2 – “Grassroot Collective Intelligence in the Missing Children Investigation”, methods and algorithms have been proposed, based on the relevant research and state-of-art analysis. The main purpose of the present deliverable is to gather the outcomes of the aforementioned tasks and extract the architectural design and implementation framework, which will serve as a basis for the ChildRescue platform realisation.

This framework defines the functionalities that need to be implemented, their mapping into integrated components and how these components are going to be implemented, the technology stack and the implementation plan. The functional and the technical aspect of the ChildRescue platform architecture have been presented. Nine components have been identified and analysed: Data Harmonisation & Interoperability Space, Communication Engine, Evaluation Engine, Profiling and Prediction Engine, Privacy, Anonymisation, Synchronisation & Security Engine, Intelligent Search Engine, Case Manager, Collaboration Space, Control Room. Additionally, tools and technologies have been proposed for the development of the various functionalities, both regarding frontend and backend activities.

Two major platform and mobile application releases are foreseen within the project, in [M18] and [M27] respectively. A first approach on the functionalities that shall be offered in each release was performed, which will guide the implementation activities. An agile development process will be followed, thus expected modifications to the presented framework, as well as the definition of APIs and connectors, will be reported in deliverables D3.3 and D3.4.

Annex I: References

- [1] Zhao, Shirley (2017-10-20). "What is ETL? (Extract, Transform, Load)", Experian Data Quality, <https://www.edq.com/blog/what-is-etl-extract-transform-load/>, last accessed: 2018-12-12.
- [2] The DSDM Agile Project Framework, MoSCoW Prioritisation : <https://www.agilebusiness.org/content/moscow-prioritisation>

Annex II: User Stories Backlog

#	EPIC	USER STORY from D1.1			UPDATED USER STORIES		VOTING
		ROLE	GOAL/DESIRE	BENEFIT	GOAL/DESIRE	BENEFIT	
			I want...	, so that...	I want...	, so that...	
VU.01	Registration	Visitor	to be able to register using minimal details or by using social media accounts	I can be part of the ChildRescue platform.			14
VU.02	Platform Browsing	Visitor	to be able to view a list of currently active missing children cases	I can actively participate in the investigation.	to be able to view a list of currently active missing children cases near my vicinity, if my geolocation is enabled	I can actively participate in the investigation.	10
VU.02.1	Platform Browsing	Visitor	N/A	N/A	to have only one active notification per case	I have a clear overview of all cases and my device is not spammed with notifications.	12
VU.03	Platform Browsing	Visitor	to sort the list of missing children based on their disappearance date	I can see the most recent ones.			12
VU.04	Platform Browsing	Visitor	to be able to visit the page of a single case	I can view more details concerning the case.			10
VU.05	Platform Browsing	Visitor	to be able to view a list of the participating organisations and their contact details	I can communicate with organisations by other means, such as telephone or postal services.			9
VU.06	Platform Browsing	Visitor	to be able to view information about the platform, terms of service and usage, etc	I can be fully aware of what the platform is about and what requirements it involves.			15
VU.07	Platform Browsing	Visitor	to be able to view information about DOs and DON'Ts regarding missing children investigation.	I can assist the investigation in an appropriate and correct - for the child at risk - manner.	to be able to view information about DOs and DON'Ts regarding missing children investigation.	I can assist the investigation in an appropriate for the child at risk manner, abiding by the law and respecting human rights.	14
VU.08	Investigation Coordination/ Communication	Visitor	to send feedback in the form of text, image or video to the Organisation concerning a missing	I can assist in the investigation mission anonymously.			9

			child by filling-in an appropriate form					
VU.08.1	Investigation Coordination/ Communication	Visitor	N/A	N/A		to be able to submit a piece of information, even for a case I am not informed about with a notification (e.g. if I meet a child alone on the street)	I can assist also in cases that I am not actively informed about through ChildRescue.	9
								0
SU.01	Registration	Simple User	to be able to specify some basic, optional personal profile information during the initial registration process	I can have a more complete and reliable personal profile which increases my integrity thus making me a trusted collaborator.				15
SU.02	Profile Editing	Simple User	to be able to edit my personal profile information	I can have a more complete personal profile which increases my integrity and reliability.				15,16666667
SU.03	Profile Editing	Simple User	to be able to allow geolocation services	I can be contacted based on my current location.				16,33333333
SU.04	Profile Editing	Simple User	to be able to permanently remove my account credentials from the system	I can no longer log-in and not be contacted by other users.		to be able to use my "right to be forgotten" under the GDPR, and permanently remove my account from the system	I can no longer log-in and not be contacted by other users.	20
SU.05	Profile Editing	Simple User	to be able to make my profile "private" or hide my details	I can safekeep my anonymity in respect to my peers.				14,58333333
SU.06	Profile Editing	Simple User	to be able to apply for volunteer for a selected organisation	I can offer my services in a more official and permanent way and get more privileges in the platform.		to get informed on the process to become a volunteer for a specific organisation	I can offer my services in a more official and permanent way and get more privileges in the platform.	10,5
SU.07	Platform Browsing	Simple User	to view a list of currently missing children, last seen around my current location	I can actively search for them.		to view a list of currently missing children, last seen around my current location	I can have an open eye for them.	15,16666667
SU.08	Platform Browsing	Simple User	to sort the list of missing children based on their disappearance date	I can see the most recent ones.				14
SU.09	Platform Browsing	Simple User	to filter out cases based on physical characteristics, such as age, hair colour, clothing	I can focus on the right case, in situations where I have a clear live view of a child.		REMOVED STORY		-

SU.10	Platform Browsing	Simple User	to be able to share information about a case on my social media accounts	I further disseminate information about the case to a larger audience.	REMOVED STORY		-
SU.11	Platform Browsing	Simple User	to be able to view a list of the participating Organisations and their contact details	I can establish a communication channel with an Organisation directly through the platform.			8
SU.11.1	Platform Browsing	Simple User	N/A	N/A	to see statistics (e.g cases solved per country) in front page if there are no active cases in vicinity, or as menu item if there are	I have a general picture of the work done by the organisations.	8
SU.12	Investigation Coordination/ Communication	Simple User	to send feedback in the form of text, image or video to the organisation concerning a missing child without the need to fill-in a long form	I can assist in the investigation mission in a quick and efficient manner.	to send geotagged and timestamped feedback in the form of text, image or video to the organisation concerning a missing child without the need to fill-in a long form	I can assist in the investigation mission in a quick and efficient manner.	15
SU.13	Investigation Coordination/ Communication	Simple User	to get notified when I have a direct message received	I know a response to my message was provided.	to get notified when I have a direct message received	I know that there is a response to the information I uploaded.	9,33333333
SU.14	Investigation Coordination/ Communication	Simple User	to be able to view messages sent to me and reply	I can continue communication with an organisation/ team.			10,5
SU.15	Investigation Coordination/ Communication	Simple User	to get notified when there is a missing child case in my vicinity	I can act on it and help the investigation.			11,66666667
SU.16	Investigation Coordination/ Communication	Simple User	to get notified when announcements are made concerning a case in my vicinity	I can be informed with latest news regarding the case.	REMOVED STORY		-
SU.16.1	Investigation Coordination/ Communication	Simple User	N/A	N/A	to have the option to select and "follow" specific cases	I still receive notifications for them, even when I am outside the notification area.	10
SU.17	Investigation Coordination/ Communication	Simple User	to get notified when a case is closed	I can stop any actions I have taken.	to get notified when a case I follow or had been notified for (even once), is closed	I can stop any actions I have started.	14
SU.18	Investigation Crowd-sourcing Action	Simple User	to evaluate a piece of information, if requested	I can validate if it is true or false according to my knowledge.	REMOVED STORY		-

RT.01	Profile Editing	S&R/Volunteer Team Member	to be able to edit my personal profile information and add more details regarding my skills, personality or general background.	I can have a more complete personal profile.			9
RT.02	Investigation Coordination/ Communication	S&R/Volunteer Team Member	to get rapidly notified when there is a missing child case and my team is required	I can act on it, get the team assembled and help the investigation in the field.	to get rapidly notified when there is a missing child case and my contribution is required	I can act on it and help the investigation in the field.	11
RT.02.1	Investigation Coordination/ Communication	S&R/Volunteer Team Member	N/A	N/A	to be able to decline an invitation to join investigation team and continue as a simple user for this specific case if at all	if i am not able to actively participate as a team member, still be able to help and receive location-based notifications as any simple registered user.	9
RT.03	Investigation Coordination/ Communication	S&R/Volunteer Team Member	to have access to a discussion channel with my team-members and case coordinators	I can get communicate with my team in a secure and private virtual space and exchange real-time messages.	to have access to a collaboration space with other team-members and case coordinators	I can communicate with my team in a secure and private virtual space.	7
RT.03.1	Investigation Coordination/ Communication	S&R/Volunteer Team Member	N/A	N/A	to be able to turn my geolocation off temporarily, but continue receiving the messages and notifications of the discussion team	I can pause and rest from an active investigation I am taking part in, but still be updated with latest news.	9,333333333
RT.03.2	Investigation Coordination/ Communication	S&R/Volunteer Team Member	N/A	N/A	to be able to quit from an investigation case and the related collaboration space	I can disengage from the search operations of this case and the respective team's affairs.	13,33333333
RT.04	Investigation Coordination/ Communication	S&R/Volunteer Team Member	to be able to upload/download files of information in the discussion channel	I can exchange multimedia files, like photos or videos, with team members and my superiors.	REMOVED STORY		-
RT.05	Investigation Coordination/ Communication	S&R/Volunteer Team Member	to get guidance and real-time profiling information about the case from coordinators	I can be constantly informed about the case's status and act in a more efficient way.	to get guidance and real-time announcements about the case from my superiors	I can be constantly informed about the case's status and act in a more efficient way.	11,66666667
RT.05.1	Investigation Coordination/ Communication	S&R/Volunteer Team Member	N/A	N/A	to have a list of the tasks I was assigned and be able to mark them when done	I have a clear overview of what I have to do.	11,66666667
RT.05.1.1	Investigation Coordination/ Communication	S&R/Volunteer Team Member	N/A	N/A	to keep a task history	I can keep track of my past activities and my superior has a better overview.	

RT.06	Investigation Coordination/ Communication	S&R/Volunteer Team Member	to be able to watch my current location, as well as other team members' locations, on an interactive map	I can have a clear overview of the team's current situation and the area each member covers.	REMOVED STORY		-
TL.01	Investigation Coordination/ Communication	S&R/Volunteer Team Leader	N/A	N/A	to be able to watch my current location, as well as other team members' locations, on an interactive map	I can have a clear overview of the team's current situation and the area each member covers.	9
TL.02	Investigation Coordination/ Communication	S&R/Volunteer Team Leader	N/A	N/A	to get guidance and real-time announcements about the case from coordinators	I can be constantly informed about the case's status and act in a more efficient way.	10,5
TL.03	Investigation Coordination/ Communication	S&R/Volunteer Team Leader	N/A	N/A	to have access to a collaboration space with teams and case coordinators with the ability to upload/download files	I can offer the necessary information (e.g. a profile record) to the investigation group or my superiors.	9,33333333
FM.01	Profile Editing	Hosting Facility Manager	to be able to edit my personal profile information and add more details regarding my skills, personality or general background.	I can have a more complete personal profile.			9
FM.02	Investigation Profiling	Hosting Facility Manager	to be able to fill in extended profiling information about an unaccompanied migrant minor residing in the premises	I can keep track of the minors I am responsible for			9
FM.03	Investigation Profiling	Hosting Facility Manager	to be able to find a minor that is documented in the system using multiple profiling criteria and fuzzy matching	when a minor comes to my care, I can have access to his history and be able to notify other facilities that the minor isn't missing	to automatically match a new child profile with existing profiles using multiple criteria	I can identify if a new coming minor has been registered before or belongs to another facility.	12
FM.04	Investigation Profiling	Hosting Facility Manager	to be able to upload documents to the platform concerning the children of my facility	there is a repository of profile records with the corresponding digital files (e.g. id papers, forms, etc).			10,5

FM.04.1	Investigation Profiling	Hosting Facility Manager	N/A	N/A	to be able to save the case info and documents in the ChildRescue platform	I can easily find and make changes to the history of a minor under my responsibility.	20
FM.05	Investigation Profiling	Hosting Facility Manager	to be able to edit/replace the documents I have uploaded to the platform	there is always the updated version of all pieces of information regarding a profile record.			17,5
FM.05.1	Facility Management	Hosting Facility Manager	N/A	N/A	to be able to signify presence or absence of minors under my hosting facility, for ex. With a tick on their photo when I see them (presentation record)	I can have an easier overview of the facility and the hosted minors.	-
FM.05.2	Facility Management	Hosting Facility Manager	N/A	N/A	to be notified by the system when a child's presence has not been updated within 24 hours	I can detect in time a possible disappearance.	-
FM.05.3	Facility Management	Hosting Facility Manager	N/A	N/A	the system to be updated regarding vacancies in my hosting facility	they are easily informed and can decide on the distribution of the applications for hosting.	-
FM.05.4	Facility Management	Hosting Facility Manager	N/A	N/A	my superiors/ the central hosting facilities management to see the state of my facility regarding capacities, etc	there is better distribution of the applications for hosting.	-
FM.05.5	Facility Management	Hosting Facility Manager	N/A	N/A	to be able to add a small report when a voluntary departure occurs	for better and more complete archiving purposes.	-
FM.06	Investigation Coordination/ Communication	Hosting Facility Manager	to be able to rapidly notify the Organisation when there is a case of a missing child in my facility	they can act on it and follow the appropriate procedures.			15
FM.07	Investigation Coordination/ Communication	Hosting Facility Manager	the system to automatically notify the managers of other facilities where the child has been before or has friends/relatives there	more people get notified that are relevant to the case.			15

FM.08	Investigation Coordination/ Communication	Hosting Facility Manager	to have access to a collaboration space with teams and case coordinators with the ability to upload/download files	I can offer the necessary information (e.g. a profile record) to the investigation group or my superiors.	REMOVED STORY		-
FM.09	Investigation Coordination/ Communication	Hosting Facility Manager	to be able to ask other facility managers for their input in case they have historical data concerning the same child	I can exchange information with other facilities.			7
FM.10	Investigation Coordination/ Communication	Hosting Facility Manager	to get guidance and real-time information about the case from coordinators	I can be constantly informed about the case's status and act in a more efficient way.			10,5
CM.01	Investigation Profiling	Organisation Case Manager	to be able to fill in the basic information about a new missing child case	I can provide basic details on that case.			17,5
CM.01.1	Investigation Profiling	Organisation Case Manager	N/A	N/A	to be able to upload a scanned document of signed consent	I can have documents related to a case gathered and easily retrievable.	17,5
CM.01.2	Investigation Profiling	Organisation Case Manager	N/A	N/A	to be able to save the case info and documents in the ChildRescue platform	I can easily find and make changes to the history of a minor under my responsibility.	20
CM.01.3	Investigation Profiling	Organisation Case Manager	N/A	N/A	to have access to all cases	I can handle whichever case I am assigned from the Coordinator and information is not lost between different shifts.	8,166666667
CM.01.4	Investigation Profiling	Organisation Case Manager	N/A	N/A	to automatically match a new child profile with existing profiles using multiple criteria and intelligent methods	I can check if it is a multiple case or if there is an active tracing request	14
CM.01.5	Investigation Profiling	Organisation Case Manager	N/A	N/A	to be able to find a case that is documented in the system using multiple profiling criteria	I can see if it is a multiple case, or there are other cases with strong resemblance.	15
CM.02	Investigation Profiling	Organisation Case Manager	to update the information of a case with more details or specify crucial information (like location	I can offer an updated description of a case.	to update and extend the information of a case with more details or specify crucial information (like	I can offer an updated description of a case.	17,5

			last seen, latest info gathered, etc.)			location last seen, latest info gathered, etc.)		
CM.02.1	Investigation Profiling	Organisation Case Manager	N/A	N/A		to update an open case whenever new information occurs	all case data is stored in a well-maintained and continuous manner.	17,5
CM.03	Investigation Profiling	Organisation Case Manager	to upload relevant multimedia files (e.g. pic of child)	I can offer a more informed description of a case.				17,5
CM.04	Investigation Profiling	Organisation Case Manager	to add social media accounts of the child	I can enhance the profiling process by using knowledge extraction on social profile preferences, activities, public posts, etc.				17,5
CM.05	Investigation Profiling	Organisation Case Manager	to add psychological reviews, witness reports, etc	I can enhance the profiling details of the missing child.				17,5
CM.05.1	Investigation Profiling	Organisation Case Manager	N/A	N/A		to perform profiling analytics	I can have insights and predictions on behavioural patterns of the case.	14
CM.06	Investigation Profiling	Organisation Case Manager	to close and archive a finished case	All people involved get notified and the case is no longer displayed as active.				17,5
CM.07	Investigation Coordination/ Communication	Organisation Case Manager	to be able to engage in real time discussions with user groups (e.g. volunteers, rescue teams)	I can carry forward relevant information in a secure and private virtual space and exchange real-time messages.				11
CM.07.1	Investigation Coordination/ Communication	Organisation Case Manager	N/A	N/A		to be able to set up a collaboration space dedicated to the missing child case and a specified general location (ex. Case 128 in Ioannina)	I can invite rescue and volunteer teams close to the area, monitor and manage them.	10
CM.08	Investigation Coordination/ Communication	Organisation Case Manager	to be able to upload/download files of information in the discussion channel	I can exchange multimedia files, like photos or videos, with the case members.				4,666666667
CM.09	Investigation Coordination/ Communication	Organisation Case Manager	to communicate with the Network Manager	I can pass location-based information to the investigation procedure on the field.				11
CM.10	Investigation Coordination/ Communication	Organisation Case Manager	to contact and get guidance by the Organisation Coordinator	I can act in a more efficient way regarding the available resources.				12

CM.11	Investigation Crowd Sourcing Action	Organisation Case Manager	to initiate a crowd-sourcing evidence validation process	I can receive feedback on the validity of a piece of information.			12,83333333
CM.12	Investigation Crowd Sourcing Action	Organisation Case Manager	to be able to configure the settings of the validation process	I can focus the process to a specific centre and range.			13,41666667
CM.13	Investigation Coordination/ Communication	Organisation Case Manager	to issue global news and announcements about a case	I can notify all users of important news	REMOVED STORY		-
CM.13.1	Investigation Crowd Sourcing Action	Organisation Case Manager	N/A	N/A	all notifications sent through the platform to the general public to include only information approved by the authorities	the whereabouts of the missing child cannot be inferred and malicious use of the platform is prevented.	14
CM.13.2	Investigation Crowd Sourcing Action	Organisation Case Manager	N/A	N/A	to configure the dissemination area of the notifications that will be sent to users based on the data analytics results and my expertise	crowdsourcing is more focused and efficient.	12
CM.14	Investigation Coordination/ Communication	Organisation Case Manager	to issue directions and information to group of users based on their location	I can notify only users that are actually near a point of interest	REMOVED STORY		-
CM.15	Investigation Coordination/ Communication	Organisation Case Manager	to be able to get real-time feedback from all available human resources (e.g. citizens, anonymous users)	I can gather all possible information			14
CM.16	Investigation Monitoring	Organisation Case Manager	to be able through the platform to monitor missing children's social accounts for new public posts	I may extract information on their whereabouts.			9
CM.17	Investigation Monitoring	Organisation Case Manager	to monitor the overall progress of the investigation	I can understand at which state it is			17,5
CM.18	Investigation Monitoring	Organisation Case Manager	to view all information about a case, sent by all participants, in historical order	I can have a more detailed view on the progress of the investigation			18,66666667
CM.18.1	Investigation Monitoring	Organisation Case Manager	N/A	N/A	every case in my dashboard to have a notification sign	I can distinguish cases with updates which I haven't seen yet.	16,33333333

CM.18.2	Investigation Monitoring	Organisation Case Manager	N/A	N/A	to easily handle cases of siblings, correlate them and avoid double typing	I work more efficiently but at the same time cover all possible scenarios (children are together or separated).	19,5
CM.18.3	Investigation Monitoring	Organisation Case Manager	N/A	N/A	to create a list of missing people cases which will be correlated	I can handle a natural disaster incident efficiently and quickly.	16
CM.18.4	Investigation Monitoring	Organisation Case Manager	N/A	N/A	to ensure that all evidence from users will remain logged and unchanged	the platform operates based on integrity and trust.	7,5
CM.19	Investigation Monitoring	Organisation Case Manager	to be able to evaluate the information gathered	I can distribute the important pieces to the relevant teams			-
CM.20	Investigation Monitoring	Organisation Case Manager	to be able to send my evaluation and current status to the Coordinator	the important information propagates to the top.			12
CM.21	Archiving	Organisation Case Manager	N/A	N/A	to semantically tag a case	it can be easier matched to similar past or future cases.	13
CM.22	Archiving	Organisation Case Manager	N/A	N/A	the case data of a closed case to be deleted from the users' devices within a fixed period of time	the privacy of the child and family is protected after closure.	17,5
NM.01	Investigation Coordination/ Communication	Organisation Network Manager	To get notified as soon as there is a new case that requires my skills	I can act rapidly to assemble the appropriate teams			13
NM.02	Investigation Coordination/ Communication	Organisation Network Manager	to be able to notify all S&R teams or/and volunteer teams to log in to the platform	we can setup a collaboration space about the case and the investigation.	to be able to invite available volunteer/S&R members, to join collaboration space	we can setup a collaboration space about the case and the investigation.	14,66666667
NM.02.1	Investigation Coordination/ Communication	Organisation Network Manager	N/A	N/A	to be able to notify with free-text message all volunteers of local S&R Teams or/and Volunteer Teams of the new case and receive their availability	I can setup teams for the investigations and give volunteers some basic contact details.	14,66666667
NM.02.2	Investigation Coordination/ Communication	Organisation Network Manager	N/A	N/A	to receive a confirmation of delivery for every invitation I have sent to volunteers	I know if my notification has reached the members.	14,66666667
NM.02.3	Investigation Coordination/ Communication	Organisation Network Manager	N/A	N/A	to be able to manually assign the team leader of every volunteer/S&R team from the available members	it is easier to coordinate separate teams.	12,83333333

NM.02.4	Investigation Coordination/ Communication	Organisation Network Manager	N/A	N/A		to be able to contact other organisations' network managers that also use the ChildRescue platform and ask for help in resources	the required human and other resources are assembled for the operations.	13,33333333
NM.02.5	Investigation Coordination/ Communication	Organisation Network Manager	N/A	N/A		to be able to notify new members and teams to join the collaboration space according to the investigation progress, especially if a new geographical location is suggested	adequate rescuers and volunteers are participating in each stage and place of the investigation.	10
NM.03	Investigation Coordination/ Communication	Organisation Network Manager	to have access or be able to create a discussion channel with the team-members and case coordinators	I can guide my teams in a secure and private virtual space and exchange real-time messages		to be able to engage in real time discussions with selected team leaders and case managers	I can guide my teams in a secure and private virtual space.	9
NM.03.1	Investigation Coordination/ Communication	Organisation Network Manager	N/A	N/A		to be able to post announcements for all team members participating in the case to view, similar to a news feed	I can give one-way instructions to the teams, which will be easily viewable.	11,66666667
NM.03.2	Investigation Coordination/ Communication	Organisation Network Manager	N/A	N/A		to mark important announcements in the timeline with different colour (highlight them somehow)	the volunteers can easily see what I think is important.	12,66666667
NM.03.3	Investigation Coordination/ Communication	Organisation Network Manager	N/A	N/A		assign tasks to participating team members	they can have a clear view of what they have to do	14,66666667
NM.03.4	Investigation Coordination/ Communication	Organisation Network Manager	N/A	N/A		to create chat rooms with selected members from the volunteer/S&R teams for communications	I can instantly exchange information with team leaders.	9
NM.04	Investigation Coordination/ Communication	Organisation Network Manager	to be able to communicate with the Case Manager in real-time	I can get the required information for the case.				11,66666667
NM.05	Investigation Coordination/ Communication	Organisation Network Manager	to be able to contact and get guidance by the Organisation Coordinator	I can be constantly informed about all cases' status and distribute human resources accordingly and more efficiently				13,33333333
NM.06	Investigation Monitoring	Organisation Network Manager	to be able to view where all field resources	I can be constantly informed about the status and				9

			(humans, vehicles, dogs) are located in real-time	whereabouts of all field resources			
NM.07	Investigation Monitoring	Organisation Network Manager	to monitor the current progress of the investigation location-wise	I can direct teams to search in specific areas			10
NM.08	Investigation Monitoring	Organisation Network Manager	to view predictions regarding the possible routes of the missing child	I can direct teams to search in specific areas			11
NM.09	Investigation Monitoring	Organisation Network Manager	to be able to send my evaluation and current status to the Coordinator	the important information propagates to the top.			11,66666667
OC.01	Investigation Profiling	Organisation Coordinator	To have access to all cases' information and be able to edit, open or close a case	I have total control of all cases.			14
OC.02	Investigation Coordination/ Communication	Organisation Coordinator	to be able to contact all Case and Network Managers	I can coordinate all available resources.			12
OC.02.1	Investigation Coordination/ Communication	Organisation Coordinator	N/A	N/A	to be able to send the case file and documents to organisations in another country	I can rapidly inform and activate legitimate organisations in case of a cross-border country	10
OC.03	Investigation Coordination/ Communication	Organisation Coordinator	to be able to engage in real time discussions with user groups (e.g. volunteers, rescue teams)	I can get real-time feedback from a group of people.	to be able to engage in real time discussions with user groups (e.g. volunteers, rescue teams)	I can carry forward relevant information in a secure and private virtual space and exchange real-time messages.	11
OC.04	Investigation Coordination/ Communication	Organisation Coordinator	to issue global news and announcements about any case	I can notify all users of important news.	REMOVED STORY		12
OC.05	Investigation Coordination/ Communication	Organisation Coordinator	to be able to contact each and every user of the platform personally	I can send and get personalised feedback.			8,5
OC.06	Investigation Monitoring	Organisation Coordinator	to monitor the overall progress of all the active investigations	I can understand at which state is each case and what assistance is required.			16,33333333
OC.07	Investigation Monitoring	Organisation Coordinator	to monitor the progress of all active investigations location-wise	I can guide the Network Manager accordingly.			11,66666667
OC.08	Investigation Monitoring	Organisation Coordinator	to be able to view all cases current and past and their full details	I have access to all available information.			5,33333333

OC.09	Investigation Management	Organisation Coordinator	to be able to assign Case and Network Managers for each case	each case is covered in the most efficient way.			14,66666667
OC.09.1	Investigation Management	Organisation Coordinator	N/A	N/A	to have access to the activity history of all case managers	I have a clear overview of the taken actions and be able to allocate cases accordingly.	13,41666667
OC.10	Investigation Management	Organisation Coordinator	to be able to file a report regarding the management of each case	there is a complete archive for each investigation, not only regarding the goal, but also about the procedures followed by all participants.			15
OC.11	Archiving	Organisation Coordinator	N/A	N/A	to aggregate data from past cases	useful outcomes are provided to be exploited in the future, in a manner always respecting privacy matters.	13,5
OC.12	Archiving	Organisation Coordinator	N/A	N/A	statistics to be generated from every case and to be correlated	I gain insights in the performance of the organisation.	15,16666667
OO.01	Organisation Information Filling	Organisation Owner	N/A	N/A	to receive invitation to activate my Organisation's profile in ChildRescue	I take control of the new profile and start managing it.	14
OO.01.1	Organisation Information Filling	Organisation Owner	to be able to set and edit the basic information about my organisation	I can provide an informative profile of the organisation.			-
OO.02	Organisation Management	Organisation Owner	to be able to view a list of all available users belonging to my organisation and at what position	I can have an overview of our human resources assignments	to be able to view a list of all available users belonging to my Organisation and at what position and location	I can have an overview of our human resources assignments	12
OO.03	Organisation Management	Organisation Owner	to be able to send invitations via e-mail to my personnel and associated teams to join the platform	I can invite them to join the platform and gather all my human resources in this collaboration platform.			12,83333333
OO.04	Organisation Management	Organisation Owner	to setup and assign roles for the organisation members (Case Manager, Network Manager, Coordinator, Volunteer Team member, Search & Rescue Team member)	I can manage the access privileges of my users to the available information and functionality.			15,16666667

00.05	Organisation Management	Organisation Owner	to remove users from my Organisation	I can reorganise our human resources			12
00.06	Organisation Management	Organisation Owner	to delete my organisation	it is no longer part of the ChildRescue platform			15,16666667
00.07	Organisation Monitoring	Organisation Owner	to have an overview of all active cases and the human resources (e.g. organisation members, volunteers, etc) assigned on each one	I can have a clear picture of the current effort and possible deficiencies			16,66666667
00.08	Organisation Monitoring	Organisation Owner	to have an overview of the duration of all historical cases and the human resources assigned on each one	I can have a clear picture of the past performance of my staff			10,41666667
00.09	Organisation Communication	Organisation Owner	to accept and reply to messages directed to my organisation by simple users or visitors of the platform	I can respond to user requests/complaints towards the organisation			14
00.10	Organisation Communication	Organisation Owner	to be able to communicate with other organisations	we can cooperate together in a mission or cause			8,75
00.11	Organisation Policy	Organisation Owner	N/A	N/A	all case data to be anonymised	the privacy of the family and the child are protected and my organisation is aligned to the GDPR requirements.	15
00.12	Organisation Policy	Organisation Owner	N/A	N/A	all case data to be encrypted	I ensure my organisation's compliance to the GDPR.	17,5
CA.01		ChildRescue Administrator	N/A	N/A	to create the organisation profile and add organisation owner	the organisation can use ChildRescue.	16,33333333

