RiskPACC

INTEGRATING RISK PERCEPTION AND ACTION TO ENHANCE CIVIL PROTECTION-CITIZEN INTERACTION

SYSTEM REQUIREMENTS AND FUNCTIONAL SPECIFICATIONS – FINAL VERSION

Deliverable D3.3

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ABOUT RISKPACC

Increasingly complex and interconnected risks globally highlight the need to enhance individual and collective disaster resilience. While there are initiatives to encourage citizen participation in creating a resilient society, these are typically fragmented, do not reach the most vulnerable members of the communities, and can result in unclear responsibilities for building disaster resilience.

New technologies can also support preparedness and response to disasters, however, there is limited understanding on how to implement them effectively. Awareness of risks and levels of preparedness across Europe remain low, with gaps between the risk perceptions and actions of citizens and between the risk perceptions of citizens and Civil Protection Authorities (CPAs).

The RiskPACC project seeks to further understand and close this Risk Perception Action Gap (RPAG). Through its dedicated co-creation approach, RiskPACC will facilitate interaction between citizens and CPAs to jointly identify their needs and develop potential procedural and technical solutions to build enhanced disaster resilience. RiskPACC will provide an understanding of disaster resilience from the perspective of citizens and CPAs, identifying resilience building initiatives and good practices led by both citizens (bottom-up) and CPAs (top-down). Based on this understanding, RiskPACC will facilitate collaboration between citizens, CPAs, Civil Society Organisations, researchers and developers through its six (6) case studies, to jointly design and prototype novel solutions.

The “Risk Pack” toolbox/package of solutions will include a framework and methodology to understand and close the RPAG; a repository of international best practice; and tooled solutions based on new forms of digital and community-centred data and associated training guidance. RiskPACC consortium comprised of CPAs, NGOs, associated organisations, researchers and technical experts will facilitate knowledge sharing and peer-learning to close the RPAG and build disaster resilience.

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Executive Summary

This deliverable provides the final version of system specifications and functional requirements reflecting user needs as the outcome of all interactions with end users that were performed during the implementation of the RiskPACC project. The identification of user needs and system requirements has been a continuous evolving process throughout the project lifetime. The specifications of the tools and platform components were examined in detail, following the same template and drove the development phase of the project. All iterations of system requirements, which have been consolidated in this report, provided concrete guidelines for the corresponding technical developments of the RiskPACC components and also served as a basis for final refinements of the system. Finally, general requirements have also been examined, relating to aspects such as legal and ethical, which had to be followed by all components. The present document is an update of system requirements that were identified in the early stages of the project and were included in D3.2: System Requirements and Functional Specifications – Initial Version, which was submitted in M08, and presents the final RiskPACC system requirements.

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Glossary and Acronyms

ACRONYM	Definition / Description
AEOLIAN	Aeolian AR Mobile Application
APP	Application
AR	Augmented Reality
AUTH	Authentication server
CMS	Content Management System
COMM	Crowdsourcing from Community
CPA	Civil Protection Authority
D	Deliverable
DoA	Description of Action
EL	Ethical and Legal
ENVIR	Crowdsourcing for Environmental Assessment
F	Functional
FRAME	Framework and Guidelines
GDPR	General Data Protection Regulation
GEN	General
HERMES	HERMES Application
LANG	Language
M	Month
MD	Mapping Damage Tool
NF	Non-Functional
OS	Operating System
PAI	Publicly Available Information
PS	PublicSonar Platform
PUB	Crowdsourcing from Publicly Available Data
REPO	Repository of Good Practices
RPAG	Risk Perception Action Gap
SERV	Digital Data Server
SR	System Requirement
T	Task
TCT	Thermal Comfort Tracker Tool
TECH	Technical
TOOLTRAIN	Tool Guidance and Training Material
TRAIN	Training Material
UR	User Requirement
USE	Usability
VGI	Volunteered Geographical Information
WHITE	White Paper
WP	Work Package

TABLE 1: GLOSSARY AND ACRONYMS

1 INTRODUCTION

1.1 Purpose and Scope

The aim of this deliverable is the provision of the final version of the RiskPACC system requirements, as identified and further shaped and refined during the project lifecycle. The main purpose is to outline the specifications for the RiskPACC system and to provide a categorisation of the requirements per component. The components of the RiskPACC system are classified into *static* components, mainly referring to the so called “conceptual RiskPACC tools” and other static material, such as best practices and relevant literature, and *dynamic* components, including in principle the RiskPACC technological tools. This report also includes other common and general requirements for the RiskPACC system. The ultimate purpose of all tools and RiskPACC platform components is to bridge the RPAG and provide end users with effective tools to be employed for a range of hazard events.

More specifically, the scope of this document is to build upon D3.2: System Requirements and Functional Specifications – Initial Version, which served as an initial integrated basis for system requirements, that has also driven the technical development of the RiskPACC components. D3.2 was submitted in M08 and provided an overview of the user requirements and the methodological process that was employed to derive them. The document then focused on translating user requirements into system requirements for each one of the RiskPACC components and defining relevant system specifications. These initial functionalities have served as the basis for the development of the subsystems and assessment of their performance through the activities of RiskPACC project under WP3 and WP6.

Initial requirements were retrieved from case studies, the project Description of the Action (DoA), interactions among partners and interactions with end-users. With the exception of the DoA, all other sources of requirements are non-stationary throughout the project lifetime, and evolved during the RiskPACC co-creation activities and piloting testing. An update and at the same time the finalization of these system functionalities, including refinements and, when necessary modifications, is included in this document. Similar to the approach adopted in D3.2, along with the categorisation of specifications for each component into functional and non-functional, their main features and characteristics (*i.e.*, requirement priority, description, rationale, and fit criteria) are also provided.

1.2 Intended Readership

As a confidential document, this deliverable is intended to be read only by the EC and the members of the RiskPACC consortium. It is addressed to EC to provide an outline of the purpose and functionality of the different components of RiskPACC project and it also addresses project developers and consortium technical readers to provide an overview of how RiskPACC system components were planned and eventually implemented.

1.3 Structure of the Deliverable

The deliverable includes six Sections. Following the Introductory Section, Section 2 provides an overview of the user requirements including the development methodology that was followed and the categorisation of requirements into functional and non-functional. The methodology developed and adopted to define the RiskPACC system specifications, delving into the variable subsystems and their components is discussed in Section 3. Section 4, employs the methodology discussed in Section 3 and showcases the system requirements for both static and dynamic components that have been developed during the project lifecycle and constitute the RiskPACC platform. Further to that, Section 4 also includes common and general functional and non-functional requirements. The main conclusions derived from D3.3 are summarized in Section 5, while relevant references are listed in Section 6. Tables with initially identified user requirements for each case study, as well as initial platform requirements and general non-functional requirements were included in D3.2 and for reasons of completeness are also included in this report and summarized in Annex I.

2 RISKPACC USER REQUIREMENTS

Task 3.1 served as a basis to identify initial needs and eventually translate them to user requirement in an iterative way. As presented in Section 2.1 and also discussed in D3.2, user requirements are classified into functional and non-functional requirements, while a methodological framework to derive these requirements, as well as the information categories of each requirement are discussed in Section 2.2. A comprehensive list of user requirements, as already identified in the early stages of the project and included in D3.2, is also included in Annex I.

2.1 Overview of Requirements

The functional and non-functional requirements of both the RiskPACC tools and the RiskPACC platform are presented in the following. The key requirements started being identified already in the initial phases of the project and were reported in D3.2. This report summarises the initial identified requirements and concludes with their updates, refinements and, when necessary, modifications.

2.1.1 Functional Requirements

As clearly stated in D3.2, functional requirements specify the functions that the new system must be able to perform to meet the user requirements. All significant functions for the system, its subsystems, components, interfaces, including the support and maintenance, must be identified. It is a set of independent elements which, along with the constraints, must reflect end users' requirements as accurately as possible. Overall,functional requirements specify what the system should do.

2.1.2 Non-Functional Requirements

Further to functional requirements and as also clearly stated in D3.2, non-functional requirements relate to qualities of the system that cut across user facing features, such as security, reliability, and performance. The categorisation of such requirements as non-functional does not mean that they are intangible. Instead, these

requirements do potentially affect the function of the system. Non-functional requirements can be also understood as quality attributes, quality goals, or quality of service requirements. While the functional requirements define what the system is supposed to do, non-functional requirements define how a system is supposed to be. It is worth mentioning that even if the functional requirement is correct (*i.e.*, the tool does what it is supposed to do), it can (and will) be concluded worthless if the key non-functional requirements are not clearly set. This means, it impacts negatively on the usability or safety of the user, or is not in line with legal framework that has to be followed. The key elements of non-functional requirements, also outlined in D3.2, are summarized in the following.

2.1.2.1 Interoperability

The interoperability is defined in terms of compatibility. Different components must be compatible and exchange information with other systems/components.

2.1.2.2 Usability

The usability is defined in terms of learnability. Tools and systems must be easy to use with no or minimal training.

2.1.2.3 Reliability

The reliability is defined in terms of availability. Systems and tools have to be working under different conditions and must have high uptime.

2.1.2.4 Data Security

Data security is defined in terms of integrity. Data security is crucial as sensitive information needs to be protected and accessed limited. Access to information may need to be password protected and/or encrypted.

2.1.2.5 Maintainability

The maintainability is defined in terms of analysability. Systems need to send clear failure messages, so it is clear on how to fix it, be easy to fix by end users, or a good support needs to be in place.

2.2 User Requirements Development Methodology

2.2.1 Case Study Needs Assessment

As discussed in detail in D3.2, RiskPACC User Requirements for both the RiskPACC tools and the RiskPACC platform and more specifically the baseline and initial needs assessment for each case study which were derived by interviews and initial workshops with the case study representatives, were outlined in D3.1. Each of the short profiles had been translated into an initial set of functionalities for the RiskPACC platform and the tools. Annex 1 includes all the relevant tables that derived from that initial analysis.

2.2.2 Requirements Resulting from the Project Description

This initial set was complemented with requirements defined in the DoA. For example, in WP4 under T4.2 “Repository of good practices” the project description detailed that

it would “facilitate the formulation of a consistent collaboration framework and methodology in T4.3 and also encompasses the development effort for the digital repository of good practices as part of the overall platform.” The repository and digital version of the framework have been required to guide the RPAG assessment process and the RPAG reduction in a strategic manner which can be implemented by the means of the tools as developed by WP5. Hence, a repository and framework section were drafted for the platform part of the user requirements as detailed in D3.2.

It is clarified, that the DoA has been a static source of requirements for the RiskPACC system and therefore this Section has not been updated as compared with Section 2.2.2 of D3.2.

2.2.3 Generic Set of User Requirements

In addition to the initial set of functional requirements stemming from the case-study needs assessment and the project description, an initial set of general (*i.e.*, non-functional) requirements has been developed. These encompassed general GDPR and Ethical requirements that were not formulated by the case studies but were nevertheless considered as important aspects for developing the platform and tools. These requirements were already identified in the initial stages of the project, reported in D3.2 and have not been modified since then. For reasons of completeness, they are presented in the following, as well.

2.2.3.1 GDPR

All technology must adhere to applicable EU and national data protection law, including the General Data Protection Regulation (GDPR) and the ePrivacy Directive (GDPR, 2016). In particular, users require that the technology adhere to the following data protection principles (EU Directive, 2016):

- Lawful, fair and transparent processing.
- Purpose limitation.
- Data minimization with limited retention times.
- Accuracy of the personal data being processed.
- Storage limitation.
- Integrity and confidentiality to ensure appropriate security of the personal data.
- Accountability, with data controllers and processors being able to demonstrate compliance with relevant legislation.
- Data subject rights.

2.2.3.2 Data Protection by Default

All technology should be designed in adherence to the principles of privacy and data protection by design and default. The GDPR requires data protection by design and by default (GDPR, 2016). Where necessary, this includes implementing appropriate technical and organisational measures, such as pseudonymisation, which facilitate the implementation of data-protection principles to ensure effective protection of individual rights and freedoms. Furthermore, by default, the technology may process only personal data that is necessary for each specific purpose of the processing.

2.2.3.3 Ethics

All technology should avoid or mitigate any ethical risks associated with its use, such

as discrimination, exclusion, bias, or mission creep that threaten the ethical soundness of the technology and/or the human rights of those who engage with it.

2.2.4 Initial Set of User Requirements

As discussed in detail in D3.2, this initial draft of the User Requirements encompassing functional and non-functional requirements for the tools and the platform, were translated into *Miro*[1] *Digital White Boards* for each of the RiskPACC case studies. These White Boards presented an overview of the tool requirements for the specific case study as well as general suggestions for the platform and non-functional requirements. Typical examples of these boards are included in D3.2 and also D3.5.

During the first round of co-creation workshops conducted with the case studies on 14th and 24th of March 2022, the Miro Boards were used to refine the requirements per case study. Therefore, each case study was asked to rank the importance of each requirement. In addition, open questions related the specification of user requirements had already been specified and could be answered during the session. Finally, the boards provided the option to specify additional functional and non-functional requirements.

In this initial phase, further to the workshops, remaining open questions or need for further clarification were dealt with either by telephone conferences between WP3, the case studies under consideration, and the relevant technical partners, or by additional written communication. By that way the initial set of end-user requirements, included in D3.2, was established and all requirements were categorized and classified based on (see D3.2):

- **Case study**: Detailing the case study of consideration
- **Context**: specifying the type of requirement, e.g. relating to communication, Volunteered Geographic Information (VGI) or platform repository
- **ReqID**: attributing a unique identifier
- **Requirement specification**: short description of the user requirement
- **Priority**: specifying the importance of the requirement for the case study under consideration
- **User scenario**: briefly describing the scenario of use related with the requirements
- **Group**: user group (CPA, citizens, volunteers, or a mix of these)
- **Type of requirement**: functional or non-functional
- **Function**: description of the function
- **Requirement**: details of the requirements
- **Rationale**: purpose or aim of the requirements

Where applicable, open questions and/or additional information were/was added per requirement. The described categories had been determined jointly with the WP5 (Tool Development) and WP7 (System architecture and technical integration) leads STAM and ICCS. The end-user requirements were then translated into functional and non-functional system requirements.

[1] Miro is a software to build online white boards and to facilitate collaborative work online.

3 METHODOLOGY

The methodology used to define the specifications of RiskPACC, as discussed in detail in D3.2, has been to split the whole RiskPACC system into subsystems and components and analyse each one of them in separate sections. Each section analyses the features and characteristics of the relevant component, followed by a section for common functional and non- functional requirements. This structure facilitates the examination of each component from all aspects, as well as capturing their features thoroughly.

The derived requirements are added per system followed by the presentation of general requirements related to the integration and validation needs. All the identified requirements had been classified based on the MoSCoW Technique (IIBA, 2009) which uses priority groups, to showcase the importance of the requirement to the system design and functionalities. This information is available in Section 4.

The MoSCoW method is a prioritization technique used in management, business analysis, project management, and software development to reach a common understanding with stakeholders on the importance they place on the delivery of each requirement. It is also known as MoSCoW prioritization or MoSCoW analysis. The term MoSCoW itself is an acronym derived from the first letter of each of four prioritization categories: M – Must have, S – Should have, C – Could have, W – Won't have. The information included in this document has been crucial for the technical partners to understand the functionalities their systems should provide, and which are fundamental to the definition of the specifications. This has allowed the technical partners to better review and understand the role of their systems to the overall RiskPACC platform architecture and design and provide more reliable, meaningful, and targeted specifications.

Initially, the user requirements provided in ANNEX I (and also discussed in D3.2) were examined and mapped to the corresponding initial system requirements. It is clarified here, that the end-user requirements *per se* were not further elaborated. However, the system functional and non-functional requirements kept being discussed, elaborated, refined and when necessary updated during the whole project lifetime. The refinement and update of these requirements followed interaction with case study owners (primarily during co-creation workshops, discussed in D3.5 and summarized in D3.7), interactions among project partners and interactions with external cities (during WP6 activities). Static requirements coming from DoA and generic, horizontal requirements were always considered during these interactions. The initial system requirements (as included in D3.2), as well as the updated ones, when relevant, are summarized in Section 4.

Overall, these system requirements are related to:

- Repository of Good Practices (REPO)
- RiskPACC Collaborative Framework (FRAME)
- Training Material (TRAIN)
- Tool Guidance and Training Material (TOOLTRAIN)
- White Paper (WHITE)

- Aeolian AR Mobile Application (AEOLIAN)
- Content Management System (CMS)
- HERMES Application (HERMES)
- PublicSonar Platform (PS)
- Mapping Damage Tool (MD)
- Thermal Comfort Tracker Tool (TCT)
- VGI solution (VGI)
- Authentication server (AUTH)
- Digital Data Server (SERV)
- Language (LANG)
- Usability (USE)
- Technical (TECH)
- Ethical and Legal (EL)
- General (GEN)

The sections below showcase the system requirements, organised in different tables according to the categories mentioned above. As discussed above, the requirements are classified into those already identified in the early stages of the project and included in D3.2 and their updates, refinements and, when necessary, modifications. Each system requirement has:

- **Unique ID** → A unique identifier.
  Format: SR-<type>-<category (short)>-<number>.
  The <type> field represents whether the system requirement is functional (describes what the system must do) and non-functional (describes how the system will do something in terms of usability, reliability etc.). The <category (short)> field is one of the entries of the list above. For example, the Unique ID SR_F_AEOLIAN_01 refers to the System Requirement (SR)_Functional_ Aeolian AR Mobile Application (AEOLIAN)_Number 01.
- **Description** → A textual description of the system requirements.
- **Rationale** → The rationale is the reason behind the specification's existence. It explains why the specification is important and how it contributes to the system's purpose.
- **Fit Criterion** → A fit criterion is a measurement for a specification. It is needed because some specifications are too vague or ambiguous to be properly useful. For example, "The system shall be easy to use" is well-intentioned, but not yet able to be implemented. However, if you add a fit criterion such as "75% of first- time users shall be able to buy the correct cinema tickets within 90 seconds, without using the help functionality" makes it clear to the designer what is needed to make the product successful (Robertson & Robertson, 2007).
- **Relevant User Requirement(s) (UR(s))** → The ID of the user-requirement(s) that this system requirement (directly or indirectly) derives from. Each system requirement may be derived from more than one end-user requirements and many system requirements may be addressing the same end-user requirement. It needs to be noted that there are system requirements that are not related to any end-user requirement, but without realizing them, other system

requirements cannot be implemented. When relevant, the user requirements included in the tables have the unique identifiers utilized in the tables in ANNEX 1.

- **Priority** → The priority of the system requirement taking into consideration the related end-user requirement(s) where they are available, as well as the design and internal architecture of the system. The prioritisation will be based on the MoSCoW Technique which uses four priority groups, based on the importance of the requirement to the system design and functionalities. These four groups are:
  - **MUST**: requirement that is mandatory in order for the system to be operable.
  - **SHOULD**: requirements of high priority that will provide key functionalities to the system.
  - **COULD**: requirements that are preferred but not necessary for the system to be functional.
  - **WON'T**: requirements that eventually will not be considered in the design of the system, followed by an appropriate justification.

4 RISKPACC SYSTEM REQUIREMENTS

RiskPACC platform is an integrated platform that includes both *static* and *dynamic* components. Following up on the analysis of end-user requirements are presented in Section 3 and the initial version of the already identified system requirements provided in Deliverable 3.2, this Section presents the final system requirements based on which the final version of the RiskPACC platform has been developed. Further to that, the final common and general functional and non-functional requirement of RiskPACC system are also presented in this Section.

4.1 Static Components

The main *static* components of RiskPACC system are core outcomes of WP4 and WP6, while there is one additional *static* component that has been derived from WP5. *Static* components coming from WP4 include the Repository of Good Practices (T4.2), the digitized version of RiskPACC Collaborative Framework (T4.3) and Training Material (T4.4). Further to these, Tool Guidance and Training Material (T5.4) have been included in the platform and the White Paper (T6.3) will be integrated once prepared. The main objective of these components is to provide end-users with training and education material to foster bridging the RPAG and also support in matching end-user needs with the different RiskPACC technological tools. The final version of system specifications strongly relies on the original identified user requirement reported in D3.2 and their update and refinement following internal interactions among project partners and platform testers. Priority levels were also defined following relevant discussions and interactions among the responsible project partner and the platform developer (ICCS).

4.1.1 Repository of Good Practices

4.1.1.1 The initially identified system requirements of the Repository of Good Practices

The system requirements for the Repository of Good Practices that were identified already in the initial phases of the project and were reported in D3.2 are presented in the following.

Attribute	Description
Unique ID	SR_F_REPO_01
Priority	Must
Description	User to receive information about good practices under different sections of the framework.
Rationale	Information about good practices must be frequently available and connected to various sections of the framework.
Fit Criterion	Users are informed about good practices.
Relevant User Requirement(s)	Requirement derived from DoA

TABLE 2: SYSTEM REQUIREMENT FOR ID SR_F_REPO_01

Attribute	Description
Unique ID	SR_F_REPO_02
Priority	Must
Description	User to be able to find and filter successful campaigns.
Rationale	It must be able to filter campaigns.
Fit Criterion	Repository of good practice (Campaigns).
Relevant User Requirement(s)	Requirement derived from project partners

TABLE 3: SYSTEM REQUIREMENT FOR ID SR_F_REPO_02

Attribute	Description
Unique ID	SR_F_REPO_03
Priority	Must
Description	Repository with information campaign material.
Rationale	CPA to upload material and "self-assess" the usefulness/impact. CPAs to upload and comment information material to raise awareness.
Fit Criterion	CPAs share practices for facilitation of peer-learning.
Relevant User Requirement(s)	ITo2, PTo2, ITo1

TABLE 4: SYSTEM REQUIREMENT FOR ID SR_F_REPO_03

4.1.1.2 Updates and final system requirements of the Repository of Good Practices

The Repository of Good practices has been updated with the requirements mentioned above. The repository reflects the RiskPACC collaborative framework (Section 4.1.2) to filter the documents properly.

4.1.2 RiskPACC Collaborative Framework

4.1.2.1 The initially identified system requirements of the Collaborative Framework

The system requirements for the RiskPACC Collaborative Framework that were identified already in the initial phases of the project and were reported in D3.2 are presented in the following.

Attribute	Description
Unique ID	SR_F_FRAME_01
Priority	Need
Description	User enters platform and receives general information about the RPAG.
Rationale	Inform user about what the RPAG is about, what is the aim of the platform.
Fit Criterion	Platform should encompass a general information section about the RPAG.
Relevant User Requirement(s)	Requirement derived from DoA

TABLE 5: SYSTEM REQUIREMENT FOR ID SR_F_FRAME_01

Attribute	Description
Unique ID	SR_F_FRAME_02
Priority	Need
Description	User to understand the conceptual background of the RPAG and the steps he/she can take to close it.
Rationale	User to understand the framework and to retrieve material to explain its application.
Fit Criterion	Platform to depict the framework and link it with additional material such as examples and the repository.
Relevant User Requirement(s)	Requirement derived from DoA

TABLE 6: SYSTEM REQUIREMENT FOR ID SR_F_FRAME_02

Attribute	Description
Unique ID	SR_F_FRAME_03
Priority	Must
Description	User to receive suggestions and instructions on closing "own" RPAG.
Rationale	Theoretical framework sections should translate into concrete recommendations and good practice collected in the repository.
Fit Criterion	Platform to include a section linking the framework with the repository.
Relevant User Requirement(s)	Requirement derived from DoA

TABLE 7: SYSTEM REQUIREMENT FOR ID SR_F_FRAME_03

4.1.2.2 Updates and final system requirements of the Collaborative Framework

The system requirements identified in D3.2 and stated in the previous paragraphs have been fully implemented and updated with the requirements presented in the following.

Attribute	Description
Unique ID	SR_F_FRAME_04
Priority	Could
Description	User to be able to perform search of the available resources
Rationale	User to be able to search easily, even without full knowledge of the framework
Fit Criterion	Platform to include free text search functionality
Relevant User Requirement(s)	N/A (not assigned to a specific user requirement, but derived from discussions with project partners)

TABLE 8: SYSTEM REQUIREMENT FOR ID SR_F_FRAME_04

Attribute	Description
Unique ID	SR_F_FRAME_05
Priority	Should
Description	User to be presented with resources depending on their role
Rationale	The user must be able to quickly find resources relevant to their role and likely use of the platform
Fit Criterion	Platform to prioritize display of resources depending on the user's role (CPA / citizen)
Relevant User Requirement(s)	N/A (not assigned to a specific user requirement, but derived from discussions with project partners)

TABLE 9: SYSTEM REQUIREMENT FOR ID SR_F_FRAME_05

Attribute	Description
Unique ID	SR_F_FRAME_06
Priority	Must
Description	User to be able to view resources specific to a framework module
Rationale	Resources must help users to understand how different framework modules can be used
Fit Criterion	Platform to be divided into sections according to the modules described in D4.3
Relevant User Requirement(s)	N/A (not assigned to a specific user requirement, but derived from discussions with project partners)

TABLE 10: SYSTEM REQUIREMENT FOR ID SR_F_FRAME_05

4.1.3 Training Material

4.1.3.1 The initially identified system requirements of the platform Training Material

The system requirements for the platform Training Material (output of T4.4) that were identified already in the initial phases of the project and were reported in D3.2 are presented in the following. It is clarified that the requirement with ID SR_F_TRAIN_02, originally mentioned in D3.2, was specifically related with training material for the technological solutions, which is now separately addressed in Section 4.1.4. Therefore, this requirement has been omitted from this Section and has been moved to Section 4.1.4.

Attribute	Description
Unique ID	SR_F_TRAIN_01
Priority	Must
Description	User to find information and training material on the RiskPACC framework.
Rationale	User to learn about the use of the RiskPACC framework.
Fit Criterion	Training material to be available via platform.
Relevant User Requirement(s)	Requirement derived from DoA

TABLE 11: SYSTEM REQUIREMENT FOR ID SR_F_TRAIN_01

Attribute	Description
Unique ID	SR_F_TRAIN_03
Priority	Must
Description	User to find information and training material for volunteers.
Rationale	Volunteers are a special group and require targeted material.
Fit Criterion	User can find material for volunteers.
Relevant User Requirement(s)	Requirement derived from DoA

TABLE 12: SYSTEM REQUIREMENT FOR ID SR_F_TRAIN_03

Attribute	Description
Unique ID	SR_F_TRAIN_04
Priority	Must
Description	User to find information and training material for children.
Rationale	Children are a special group and require targeted material.
Fit Criterion	User can find material for children.
Relevant User Requirement(s)	ITo2, ITo3, ITo4

TABLE 13: SYSTEM REQUIREMENT FOR ID SR_F_TRAIN_04

Attribute	Description
Unique ID	SR_F_TRAIN_05
Priority	Should
Description	CPA to include training material to facilitate the understanding of maps.
Rationale	Integration of training material to facilitate the understanding of maps.
Fit Criterion	CPA to communicate risk management information.
Relevant User Requirement(s)	Ato1

TABLE 14: SYSTEM REQUIREMENT FOR ID SR_F_TRAIN_05

4.1.3.2 Updates and final system requirements of the platform Training Material

The system requirements SR_F_TRAIN_01 and SR_F_TRAIN_05, initially identified in D3.2 and stated in the previous paragraphs, have been fully implemented.

As for system requirements SR_F_TRAIN_03 and SR_F_TRAIN_04, it is highlighted here that during the development of the Collaborative Framework, which followed their initial identification, these requirements were modified. More specifically, the Collaborative Framework incorporated a variety of different resources of ready–made training material for volunteers, children and other target groups and therefore SR_F_TRAIN_03 and SR_F_TRAIN_04 have been replaced by SR_F_TRAIN_06.

Attribute	Description
Unique ID	SR_F_TRAIN_06
Priority	Should
Description	User to find guidelines on what a training material should include for different target groups (citizens, CPAs, Volunteers, Elderly, Children, People with disabilities, Immigrants, Women)
Rationale	Different target groups require different orientation and approach when creating training material
Fit Criterion	Training material to be available via platform.
Relevant User Requirement(s)	Requirement derived from DoA

TABLE 15: SYSTEM REQUIREMENT FOR ID SR_F_TRAIN_06

Additionally, for the implementation of Lab Phase I and Lab Phase II and the finalization of the conceptual tools that aim to enhance the two-way communication between CPAs and different target groups, some new requirements for the Training Material were identified and are presented in the following.

Attribute	Description
Unique ID	SR_F_TRAIN_07
Priority	Must
Description	User to find information and training material on the repository of good practices.
Rationale	User to learn about the methodology and the use of the repository.
Fit Criterion	Training material to be available via platform.
Relevant User Requirement(s)	N/A (not assigned to a specific user requirement, but derived from discussions with project partners)

TABLE 16: SYSTEM REQUIREMENT FOR ID SR_F_TRAIN_07

Attribute	Description
Unique ID	SR_F_TRAIN_08
Priority	Must
Description	User to find training material on how to implement different exercises on risk communication
Rationale	Integration of guidelines to enhance and facilitate discussions.
Fit Criterion	Training material to be available via platform.
Relevant User Requirement(s)	N/A (not assigned to a specific user requirement, but derived from discussions with project partners)

TABLE 17: SYSTEM REQUIREMENT FOR ID SR_F_TRAIN_08

4.1.4 Tool Guidance and Training Material

4.1.4.1 System requirements of the Tool Guidance and Training Material

The core system requirement for the Tool Guidance and Training Material (output of T5.4), which was integrated in the overall requirements for training material presented in D3.2, is presented in the following.

Attribute	Description
Unique ID	SR_F_TOOLTRAIN_01
Priority	Must
Description	User to find information and training material on the tools developed by RiskPACC in a dedicated area.
Rationale	User to share material and learn from others on closing the RPAG.
Fit Criterion	Content to be added by users and content retrievable by user.
Relevant User Requirement(s)	Requirement derived from DoA

TABLE 18: SYSTEM REQUIREMENT FOR ID SR_F_TOOLTRAIN_01 (REPORTED IN D3.2 AS SR_F_TRAIN_02)

As also clarified in Section 4.1.3.1, this requirement was mentioned in D3.2 as requirement SR_F_TRAIN_02, and was included among the requirements for the Training Material. However, as it is a specific requirement for the Tool Guidance and Training Material (output of T5.4) and not for the Training Material (output of T4.4), it has been omitted from Section 4.1.3.1 and has been moved to this Section.

4.1.5 White Paper

4.1.5.1 System requirements of the White Paper

The core system requirement for the White Paper (output of T6.3), is presented in the following.

Attribute	Description
Unique ID	SR_F_WHITE_01
Priority	Must
Description	A white paper that will encompass a summary of the lessons learned and recommendation for policy makers at EU and national level and suggest a roadmap to close the RPAG.
Rationale	Enhancing the involvement of citizens at local, regional, national and EU level
Fit Criterion	White Paper to be available via platform.
Relevant User Requirement(s)	Requirement derived from DoA

TABLE 19: SYSTEM REQUIREMENT FOR ID SR_F_WHITE_01

4.2 Dynamic components

The *dynamic* components of the RiskPACC toolbox comprise of the tools (developed and derived from WP5) which are listed in the following:

- Aeolian AR mobile application (AEOLIAN) [ICCS]: the tool is focused on the development of an AR mobile app and other gamified approached to enhance the bi-directional communication between CPAs and users and provide educational learning

features for users with regards to natural and man-made hazards. It is clarified here that this tool was reported as “Crowdsourcing for environmental assessment (ENVIR)” in D3.2.

- HERMES Application (HERMES) [STAM]: the tool is focused on providing a web-based platform to categorise users in communities. It is clarified here that this tool was reported as “Crowdsourcing from community (COMM)” in D3.2.
- PS Tool (PS) [CS]: the tool is focused on sentiment analysis derived from publicly available data. It is clarified here that this tool was reported as “Crowdsourcing from publicly available data (CS)” in D3.2.
- Mapping Damage Tool (MD) [UT]: the tool is focused on providing a Volunteered Geographical Information (VGI) tool that implements improved methodologies for crowdsourced geo-data generation and micro- tasking. It is clarified here that this tool was one of the two tools reported as “VGI Solutions” (VGI)” in D3.2.
- Thermal Comfort Tracker Tool (TCT) [UT]: the tool is focused on providing a VGI tool that implements improved methodologies for crowdsourced geo-data generation and micro- tasking. It is clarified here that this tool was one of the two tools reported as “VGI Solutions” (VGI)” in D3.2.

4.2.1 Aeolian AR Mobile Application (AEOLIAN) [ICCS]

The Aeolian AR mobile application component focuses on the development of an Augmented Reality (AR) mobile application to enable dissemination of timely bi-directional information (e.g. warnings) and media (e.g. photos, videos) to enhance all phases of disaster risk management related with natural and man-made hazard events (Michalis et al., 2023). The core functionalities of the mobile app include:

- Direct dissemination of early warnings, effective communication of risks related with natural and man-made hazards to citizens to increase their disaster preparedness and response,
- real-time bi-directional interaction between CPAs and citizens (incl. volunteers) through chat functionality and targeted training sessions,
- crowdsourcing capabilities to support collection of latest information from end-users about ongoing hazards through the reporting functionality,
- provision of critical information for natural and/or man-made hazards on a map so to increase situational awareness of the end users for ongoing hazard events and enhance overall awareness for past events of interest,
- enhance learning through the AR feature and the development of disaster tales (virtual education material) focused on climatic and other risks (*e.g.*, flood related hazards, heatwaves, forest fires, droughts, landslides, chemical accidents), to train and educate users through historical information.

4.2.1.1 The initially identified system requirements of the Aeolian app

The initial system requirements of the Aeolian app, as reported in D3.2, are presented in the following.

4.2.1.1.1 Mobile application

Attribute	Description
Unique ID	SR_F_AEOLIAN_01
Priority	Must
Description	A user opens the application and wants to access training material but needs to create a profile in order to view the available material.
Rationale	The mobile application will not be open for general use. It will be available only for registered users.
Fit Criterion	All app users will be linked to their respective unique ID.
Relevant User Requirement(s)	CTo06

TABLE 20: SYSTEM REQUIREMENT FOR ID SR_F_AEOLIAN_01 (REPORTED IN D3.2 AS SR_F_ENVIR_01)

Attribute	Description
Unique ID	SR_F_AEOLIAN_02
Priority	Should
Description	Users may choose to participate as citizens or register to volunteer groups.
Rationale	Having volunteer groups will facilitate the CPA to organise targeted alerting and tasking.
Fit Criterion	The users are organised in types.
Relevant User Requirement(s)	ATo11

TABLE 21: SYSTEM REQUIREMENT FOR ID SR_F_AEOLIAN_02 (REPORTED IN D3.2 AS SR_F_ENVIR_02)

Attribute	Description
Unique ID	SR_F_AEOLIAN_03
Priority	Must
Description	Users of the application want to have access to risk assessment information about hazards. They want to be able to visit the information material repository and browse through all the available material.
Rationale	The material must be available all the time to be queried on-demand.
Fit Criterion	Citizens can access and understand risk assessments.
Relevant User Requirement(s)	ITo3, ETo01

TABLE 22: SYSTEM REQUIREMENT FOR ID SR_F_AEOLIAN_03 (REPORTED IN D3.2 AS SR_F_ENVIR_03)

Attribute	Description
Unique ID	SR_F_AEOLIAN_04
Priority	Must
Description	Citizens have observed that there is an interconnectedness between hazards (e.g. wildfires and flood risks). They want to access information material about it.
Rationale	User to access information material that will help to understand how climatic phenomena are interconnected.
Fit Criterion	Citizens to learn about interconnectedness.
Relevant User Requirement(s)	ATo2a, ITo3

TABLE 23: SYSTEM REQUIREMENT FOR ID SR_F_AEOLIAN_04 (REPORTED IN D3.2 AS SR_F_ENVIR_04)

Attribute	Description
Unique ID	SR_F_AEOLIAN_05
Priority	Should
Description	Volunteers have access to specialised training material and guidelines.
Rationale	Volunteers have a special role at emergency situations. Hence, they need to receive specific training material.
Fit Criterion	The volunteers receive targeted material to help them prepare.
Relevant User Requirement(s)	ATo3, ETo04

TABLE 24: SYSTEM REQUIREMENT FOR ID SR_F_AEOLIAN_05 (REPORTED IN D3.2 AS SR_F_ENVIR_05)

Attribute	Description
Unique ID	SR_F_AEOLIAN_06
Priority	Should
Description	User to access historical information material (text, image, video etc.) about disasters that have happened.
Rationale	Users want to know about past events and how they have affected an area especially if the results are still visible.
Fit Criterion	User to be educated about previous disasters in the area.
Relevant User Requirement(s)	ATo4

TABLE 25: SYSTEM REQUIREMENT FOR ID SR_F_AEOLIAN_06 (REPORTED IN D3.2 AS SR_F_ENVIR_06)

Attribute	Description
Unique ID	SR_F_AEOLIAN_07
Priority	Must
Description	Citizens to receive information via pictograms.
Rationale	Access barriers to information should be reduced; pictograms can bridge language and literacy barriers.
Fit Criterion	Pictograms to inform about the hazard and response behaviour.
Relevant User Requirement(s)	ITO5

TABLE 26: SYSTEM REQUIREMENT FOR ID SR_F_AEOLIAN_07 (REPORTED IN D3.2 AS SR_F_ENVIR_07)

Attribute	Description
Unique ID	SR_F_AEOLIAN_08
Priority	Should
Description	Users go into the application and choose the training material they want to consume. There are various types of material available (e.g., evacuation process, safety assembly points).
Rationale	Users want to be informed and prepared about potential hazards.
Fit Criterion	The material increases knowledge and preparedness.
Relevant User Requirement(s)	ATo1

TABLE 27: SYSTEM REQUIREMENT FOR ID SR_F_AEOLIAN_08 (REPORTED IN D3.2 AS SR_F_ENVIR_08)

Attribute	Description
Unique ID	SR_F_AEOLIAN_09
Priority	Must
Description	Users go into the application and choose the training material they want to consume (e.g. awareness rising for interconnectedness risks between specific hazards, wildfires and flood risks). After completing the material, they answer to some relevant questions (i.e., gamification).
Rationale	Users are more engaged when there are gamification aspects, and through a quiz it is easier to assess own preparedness.
Fit Criterion	The application should assess knowledge and increase preparedness.
Relevant User Requirement(s)	ETo05, ETo10, ATo2b, ITO4a

TABLE 28: SYSTEM REQUIREMENT FOR ID SR_F_AEOLIAN_09 (REPORTED IN D3.2 AS SR_F_ENVIR_09)

Attribute	Description
Unique ID	SR_F_AEOLIAN_10
Priority	Must
Description	The citizens want to use the app to discuss with the CPA about a request for assistance or inform them of a situation.
Rationale	In a case of an emergency, it is more effective to be able to contact the CPA directly.
Fit Criterion	Enhance bilateral communication between citizens and CPAs during the response phase.
Relevant User Requirement(s)	ATo9, ITO6

TABLE 29: SYSTEM REQUIREMENT FOR ID SR_F_AEOLIAN_10 (REPORTED IN D3.2 AS SR_F_ENVIR_10)

Attribute	Description
Unique ID	SR_F_AEOLIAN_11
Priority	Should
Description	A user is going around and notices a dangerous situation. They open the application, capture the moment on a media (e.g. photo, video) and upload the data of the climatic risk to the platform.
Rationale	Data from first witnesses can radically decrease the time for spotting hazardous situation and reacting to it.
Fit Criterion	The crowd-sourced media is successfully uploaded and can be assessed by the CPA.
Relevant User Requirement(s)	ATo5

TABLE 30: SYSTEM REQUIREMENT FOR ID SR_F_AEOLIAN_11 (REPORTED IN D3.2 AS SR_F_ENVIR_11)

Attribute	Description
Unique ID	SR_F_AEOLIAN_12
Priority	Must
Description	Citizens are able to access maps including hazards information, strategic assembly points and response instructions.
Rationale	Mapped information is an efficient way to communicate, point out, and group information.
Fit Criterion	The mapped information is crucial so it must be correct and precise.
Relevant User Requirement(s)	ETo08, ATo14

TABLE 31: SYSTEM REQUIREMENT FOR ID SR_F_AEOLIAN_12 (REPORTED IN D3.2 AS SR_F_ENVIR_12)

Attribute	Description
Unique ID	SR_F_AEOLIAN_13
Priority	Must
Description	A volunteer has heard about an event and wants to provide help. They open the application and use the map to find information about the affected areas.
Rationale	Maps will be promptly updated with the most recent data about occurring situations.
Fit Criterion	Volunteers have access to maps of affected areas.
Relevant User Requirement(s)	LCTo6

TABLE 32: SYSTEM REQUIREMENT FOR ID SR_F_AEOLIAN_13 (REPORTED IN D3.2 AS SR_F_ENVIR_13)

4.2.1.1.2 Aeolian app Content Management System

Attribute	Description
Unique ID	SR_F_CMS_01
Priority	Must
Description	CPA can send information material to volunteers.
Rationale	Possibility to collaborate with volunteers.
Fit Criterion	Non-organised volunteers to receive information/instructions to support CPA.
Relevant User Requirement(s)	ETo04, LCTo4, Ato3, Ato13

TABLE 33: SYSTEM REQUIREMENT FOR ID SR_F_CMS_01

Attribute	Description
Unique ID	SR_F_CMS_02
Priority	Must
Description	The CPA have a map available where they can mark strategic areas and places of occurring hazards.
Rationale	CPA can make strategic POIs available through a map.
Fit Criterion	The backend provides a map to input strategic POIs.
Relevant User Requirement(s)	Eto08, Ato14

TABLE 34: SYSTEM REQUIREMENT FOR ID SR_F_CMS_02

Attribute	Description
Unique ID	SR_F_CMS_03
Priority	Must
Description	Providing supporting steps/means that will help end users to prepare. CPA to include additional material facilitating the actual preparedness.
Rationale	Information and instructions on what should be done to prepare does not easily translate into action. Hence, more training/work on this is needed.
Fit Criterion	Enhance preparedness levels of volunteers
Relevant User Requirement(s)	Eto02, Eto03

TABLE 35: SYSTEM REQUIREMENT FOR ID SR_F_CMS_03

Attribute	Description
Unique ID	SR_F_CMS_04
Priority	Must
Description	The CPA can view and analyse simple statistics of quiz results to evaluate the impact of the training material.
Rationale	The CPA may judge the effectiveness of the material and make relevant adjustments.
Fit Criterion	CPA to analyse if instructions are perceived.
Relevant User Requirement(s)	Eto10

TABLE 36: SYSTEM REQUIREMENT FOR ID SR_F_CMS_04

Attribute	Description
Unique ID	SR_F_CMS_05
Priority	Should
Description	The backend component sends alerts about the start and stop of hazardous events.
Rationale	Citizens want to know when hazardous events are over so that they know they are secure.
Fit Criterion	CPAs can successfully start and end an alert.
Relevant User Requirement(s)	Ato15

TABLE 37: SYSTEM REQUIREMENT FOR ID SR_F_CMS_05

Attribute	Description
Unique ID	SR_F_CMS_06
Priority	Must
Description	The CPA wants to communicate to citizens directly.
Rationale	Direct communication is more targeted when citizens are in an area of emergency, or volunteering in situ.
Fit Criterion	Messaging capabilities with citizens.
Relevant User Requirement(s)	ATo9, ITO6, PTo3

TABLE 38: SYSTEM REQUIREMENT FOR ID SR_F_CMS_06

Attribute	Description
Unique ID	SR_F_CMS_07
Priority	Must
Description	CPA to send specific information/tasks to volunteer groups.
Rationale	Enhance collaboration between CPAs and citizen volunteers that can be called on in a crisis.
Fit Criterion	Specific alerts for local organised volunteer teams.
Relevant User Requirement(s)	ATo11, ATo13

TABLE 39: SYSTEM REQUIREMENT FOR ID SR_F_CMS_07

Attribute	Description
Unique ID	SR_F_CMS_08
Priority	Should
Description	CPA to be able to provide historical data about past events.
Rationale	By examining geo-localised material of past events, it is easier to relate and be educated by example.
Fit Criterion	The historic data examples enhance and accelerate awareness.
Relevant User Requirement(s)	ATo4

TABLE 40: SYSTEM REQUIREMENT FOR ID SR_F_CMS_08

Attribute	Description
Unique ID	SR_F_CMS_09
Priority	Could
Description	CPA to have one channel to inform the media, by exposing an RSS feed of the content.
Rationale	Have a dedicated channel/section to inform the media.
Fit Criterion	CPA to have streamlined communication with the media.
Relevant User Requirement(s)	ATo16

TABLE 41: SYSTEM REQUIREMENT FOR ID SR_F_CMS_09

4.2.1.2 Updates and final system requirements of the Aeolian app

The system requirements identified in D3.2 and stated in the previous paragraphs have been fully implemented and updated with the requirements presented in the following.

Attribute	Description
Unique ID	SR_F_AEOLIAN_14
Priority	Must
Description	The application must provide a feature to initiate a call to the local emergency number from the main screen.
Rationale	In case of emergencies, users must be able to contact emergency services quickly and easily.
Fit Criterion	The emergency call feature must be accessible with minimum taps/clicks from the main screen.
Relevant User Requirement(s)	N/A (not assigned to a specific user requirement, but derived from discussions with project partners and end-users)

TABLE 42: SYSTEM REQUIREMENT FOR ID SR_F_AEOLIAN_14

Attribute	Description
Unique ID	SR_F_AEOLIAN_15
Priority	Must
Description	The application must allow users to navigate to a specified training area using an external mapping service (e.g., Google Maps).
Rationale	This feature provides users with a convenient way to get directions to a training location, enhancing user experience and ease of access.
Fit Criterion	When a training location icon is clicked, there is an option to open an external mapping service with the training area's coordinates or address pre-loaded.
Relevant User Requirement(s)	N/A (not assigned to a specific user requirement, but derived from discussions with project partners and end-users)

TABLE 43: SYSTEM REQUIREMENT FOR ID SR_F_AEOLIAN_15

Attribute	Description
Unique ID	SR_F_AEOLIAN_16
Priority	Must
Description	Users go into the application and choose the training material they want to consume (e.g. awareness rising for interconnectedness risks between specific hazards, wildfires and flood risks). After completing the material, they answer to some relevant questions (i.e., gamification).
Rationale	Users are more engaged when there are gamification aspects, and through a quiz it is easier to assess own preparedness.
Fit Criterion	The application must use gamification to evaluate knowledge and improve preparedness while tracking the user's progress. It should also allow users to replay quizzes to revisit and reinforce the information they've learned.
Relevant User Requirement(s)	ETo05, ETo10, ATo2b, ITO4a

TABLE 44: SYSTEM REQUIREMENT FOR ID SR_F_AEOLIAN_16

It is clarified here that the requirement SR_F_AEOLIAN_16 is an update of the requirement SR_F_AEOLIAN_09, which had been identified at the early stages of the project and is mentioned in Section 4.2.1.1.1 and also in Deliverable D3.2 (reported there as SR_F_ENVIR_09).

Attribute	Description
Unique ID	SR_F_AEOLIAN_17
Priority	Must
Description	The citizens want to use the app to discuss with the CPA about a request for assistance or inform them of a situation.
Rationale	In a case of an emergency, it is more effective to be able to contact the CPA directly.
Fit Criterion	Enhance bilateral communication between citizens and CPAs during the response phase and do it in a secure manner to ensure the reliability of the data exchanged.
Relevant User Requirement(s)	ATo9, ITO6

TABLE 45: SYSTEM REQUIREMENT FOR ID SR_F_AEOLIAN_17

It is clarified here that the requirement SR_F_AEOLIAN_17 is an update of the requirement SR_F_AEOLIAN_10, which had been identified at the early stages of the project and is mentioned in Section 4.2.1.1.1 and also in Deliverable D3.2 2 (reported there as SR_F_ENVIR_10).

Attribute	Description
Unique ID	SR_F_AEOLIAN_18
Priority	Should
Description	A user is going around and notices a dangerous situation. They open the application, capture the moment on a media (e.g. photo, video) and upload the data of the climatic risk to the platform.
Rationale	Data from first witnesses can radically decrease the time for spotting hazardous situation and reacting to it.
Fit Criterion	The crowd-sourced media is successfully uploaded and can be assessed by the CPA. To maintain user safety, the system must allow hazard reporting from both the current location and remotely.
Relevant User Requirement(s)	ATo5

TABLE 46: SYSTEM REQUIREMENT FOR ID SR_F_AEOLIAN_18

It is clarified here that the requirement SR_F_AEOLIAN_18 is an update of the requirement SR_F_AEOLIAN_11, which had been identified at the early stages of the project and is mentioned in Section 4.2.1.1.1 and also in Deliverable D3.2 (reported there as SR_F_ENVIR_11).

4.2.2 HERMES Application (HERMES) [STAM]

The web-based solution which has been developed by STAM aims to facilitate the communication between CPAs and citizens in case of emergency. The web-based platform allows to share information as quickly as possible in different ways by:

- creating a post describing an imminent hazard: it could be created both by a generic citizen, a volunteer, or the local CPA. In the first two cases, the content of the post must be approved before it becomes available to all citizens and the contents could be revised to make the post more understandable and official. The creation of a post requires essential information such as the emergency which is occurred (the type of risks analysed within RiskPACC – natural hazard, terroristic, CBRN, pandemic ones), the location of the event, a temporal reference (with the possibility to introduce the starting and ending point) and a description of what is visible. Moreover, the user can upload a picture already present on the device.
- using chatting services by a messaging system between each citizen and the CPA.
- sending and receiving targeted notifications to users based on their profiles creating user groups/communities (based on criteria as elderly, geo-location, medical diseases). The notification will be sent to specific categories of users or to all, if necessary, established by the CPA during the creation of the official post.

Finally, through the platform the CPA will be able to upload all files useful to describe the behaviours to be adopted in case of emergencies that are considered within the

project and that could occur within the localities that will introduce the use of the platform.

4.2.2.1 The initially identified system requirements of the HERMES app

The initial system requirements of the HERMES application, as reported in D3.2, are presented in the following.

Attribute	Description
Unique ID	SR_F_HERMES_01
Priority	Must
Description	The CPA must be able to communicate risk assessment information to citizens, meaning they want to integrate and make it accessible to users.
Rationale	The information material that CPA may have can be useful for different user groups.
Fit Criterion	CPA can successfully communicate information.
Relevant User Requirement(s)	ITo1, ETo01

TABLE 47: SYSTEM REQUIREMENT FOR ID SR_F_HERMES_01 (REPORTED IN D3.2 AS SR_F_COMM_01)

Attribute	Description
Unique ID	SR_F_ HERMES_02
Priority	Could
Description	During a state of emergency, a citizen wants to insert his/her safety status as well as access updates on the safety status of other community members.
Rationale	In case of emergency citizens want to be aware about the well-being of other citizens.
Fit Criterion	Users can easily update and find out the safety status of other citizens belonging to the same community group.
Relevant User Requirement(s)	ETo09

TABLE 48: SYSTEM REQUIREMENT FOR ID SR_F_HERMES_02 (REPORTED IN D3.2 AS SR_F_COMM_02)

Attribute	Description
Unique ID	SR_F_ HERMES_03
Priority	Must
Description	In order to be able to provide more targeted support, the CPA wants to have access to specific groups of vulnerable people. Thus, people need to register and indicate certain parameters for vulnerability.
Rationale	Vulnerable people to register in the tool to make their needs known to the authorities.
Fit Criterion	There is a vulnerable people registry.
Relevant User Requirement(s)	PTo1

TABLE 49: SYSTEM REQUIREMENT FOR ID SR_F_HERMES_03 (REPORTED IN D3.2 AS SR_F_COMM_03)

Attribute	Description
Unique ID	SR_F_ HERMES_04
Priority	Must
Description	In case of a major emergency, the CPA wants to create geo-localised warnings that reach people based on their location. The CPA wants to be able to provide specific instructions and warn only relevant – maybe isolated – areas.
Rationale	When a critical situation is happening/occuring in one area, it is both useless and dangerous to send alerts to every user regardless of their location.
Fit Criterion	The alert is reaching out only to affected people.
Relevant User Requirement(s)	PTo5, PTo6

TABLE 50: SYSTEM REQUIREMENT FOR ID SR_F_HERMES_04 (REPORTED IN D3.2 AS SR_F_COMM_04)

Attribute	Description
Unique ID	SR_F_ HERMES_05
Priority	Could
Description	CPA to have higher resolution data about hazards.
Rationale	The aim is to evaluate the comfort of public spaces in case of heat waves or the impacts of other climatic events.
Fit Criterion	CPA to collect data in a distributed way.
Relevant User Requirement(s)	PTo7

TABLE 51: SYSTEM REQUIREMENT FOR ID SR_F_HERMES_05 (REPORTED IN D3.2 AS SR_F_COMM_05)

Attribute	Description
Unique ID	SR_F_ HERMES_06
Priority	Should
Description	Different authorities have access to the platform/tool and can process information.
Rationale	Enhance collaboration between authorities and align communication to citizens.
Fit Criterion	Platform/tool should connect with different DRM authorities.
Relevant User Requirement(s)	ATo10

TABLE 52: SYSTEM REQUIREMENT FOR ID SR_F_HERMES_06 (REPORTED IN D3.2 AS SR_F_COMM_06)

Attribute	Description
Unique ID	SR_F_ HERMES_07
Priority	Should
Description	Connect CPAs, citizens, and other stakeholders.
Rationale	Facilitate communication between different stakeholders.
Fit Criterion	Enhance information exchange.
Relevant User Requirement(s)	PTo9

TABLE 53: SYSTEM REQUIREMENT FOR ID SR_F_HERMES_07 (REPORTED IN D3.2 AS SR_F_COMM_07)

Attribute	Description
Unique ID	SR_F_C HERMES_08
Priority	Must
Description	CPAs to exchange information with vulnerable groups.
Rationale	Two-way communication between CPAs and citizens.
Fit Criterion	Two-way communication to be facilitated via tool. CPAs and citizens to communicate with each other.
Relevant User Requirement(s)	PTo8

TABLE 54: SYSTEM REQUIREMENT FOR ID SR_F_HERMES_08 (REPORTED IN D3.2 AS SR_F_COMM_08)

4.2.2.2 Updates and final system requirements of the HERMES app

The system requirements identified in D3.2 and stated in the previous paragraphs have been fully implemented. The only exception is requirement SR_F_ HERMES_02. In fact, this particular requirement was not considered as a necessary functionality of HERMES. The co-creation approach highlighted this particular requirement as being difficult for users to adopt during emergencies.

4.2.3 PublicSonar Platform (PS) [CS]

RiskPACC's inclusion of CrowdSense (CS) technology strives to exploit crowdsourced data to help organisations obtain real-time knowledge from Publicly Available Information (PAI) sources and mitigate the hazardous impact of natural and man-made hazards.

The PublicSonar platform, deployed by CS, has been developed and customised based on daily experience from several Dutch and other European CPAs over several years. The application of innovative technologies, such as machine learning, deep learning, or natural language processing, combined with the increase of publicly available data has led CPA users to gain real-time alerts and situational awareness on their domain of expertise. It allows CPAs to recognise signs of an emerging disruption at an early stage and to support operational decisions based on a comprehensive overview of an emerging or ongoing event and its effects on the public.

In the specific scope of RiskPACC, the PublicSonar platform, conducts, under strict privacy requirements, a sentiment analysis based on millions of online interactions per day, including data from social media, and delivers real-time messages and analyses, video feeds and images through its online application.

The main features / functionalities are:

- Automated sentiment analysis for multiple EU languages;
- AI word suggestion functionalities adapted for multiple EU countries;
- Public perception evolution analysis pre or post actions from CPA;
- Expand and deepen vocabulary and location indicators for multiple EU countries;
- Creation of real-time adjustable searches specific for the CPA use cases;
- The ability to send personalised alerts, customisable per search;
- Enablement of customise dashboards, reports or export matching the project's needs.

4.2.3.1 The initially identified system requirements of the PublicSonar platform

The initial system requirements of the PublicSonar platform, as reported in D3.2, are presented in the following.

Attribute	Description
Unique ID	SR_F_PS_01
Priority	Should
Description	Crowdsourcing social media for situation assessment.
Rationale	Crowdsourcing of social media.
Fit Criterion	CPA to develop a better and more detailed situation assessment including pictures from the ground.
Relevant User Requirement(s)	LCTo7

TABLE 55: SYSTEM REQUIREMENT FOR ID SR_F_PS_01 (REPORTED IN D3.2 AS SR_F_PUB_01)

Attribute	Description
Unique ID	SR_F_PS_02
Priority	Should
Description	Obtaining in-time photos or short videos from the place of accidents (events), e.g. when flash floods occur.
Rationale	CPA to use social media information for situation assessment.
Fit Criterion	Crowdsourcing of social media.
Relevant User Requirement(s)	CTo09

TABLE 56: SYSTEM REQUIREMENT FOR ID SR_F_PS_02 (REPORTED IN D3.2 AS SR_F_PUB_02)

Attribute	Description
Unique ID	SR_F_PS_03
Priority	Could
Description	CPA to send information to citizens, but also to crowdsource social media.
Rationale	Better distribution of safety information and the possibility of using it for educating citizens online; access information provided by citizens.
Fit Criterion	Two-way communication via social media. CPA to inform citizens about occurring events and extract information.
Relevant User Requirement(s)	CTo05

TABLE 57: SYSTEM REQUIREMENT FOR ID SR_F_PS_03 (REPORTED IN D3.2 AS SR_F_PUB_03)

Attribute	Description
Unique ID	SR_F_PS_04
Priority	Should
Description	Enhanced and concentrated use of social media by several CPAs.
Rationale	More concerted use of social media in multi-agency settings.
Fit Criterion	Streamline communication to citizens.
Relevant User Requirement(s)	LCTo3

TABLE 58: SYSTEM REQUIREMENT FOR ID SR_F_PS_04 (REPORTED IN D3.2 AS SR_F_PUB_04)

Attribute	Description
Unique ID	SR_F_PS_05
Priority	Must
Description	CPA to communicate maps via app/social media.
Rationale	Enhance collaboration between CPAs and citizen volunteers that can be called on in a crisis.
Fit Criterion	Communication of an affected area via the use of satellite maps.
Relevant User Requirement(s)	LCTo6

TABLE 59: SYSTEM REQUIREMENT FOR ID SR_F_PS_05 (REPORTED IN D3.2 AS SR_F_PUB_05)

Attribute	Description
Unique ID	SR_F_PS_06
Priority	Should
Description	Use of social media to build resilience for vulnerable people.
Rationale	CPA to send instructions to dedicated groups.
Fit Criterion	CPA to send information to vulnerable groups.
Relevant User Requirement(s)	LCTo1

TABLE 60: SYSTEM REQUIREMENT FOR ID SR_F_PS_06 (REPORTED IN D3.2 AS SR_F_PUB_06)

4.2.3.2 Updates and final system requirements of the PublicSonar platform

The system requirements SR_F_PS_01, SR_F_PS_02 and SR_F_PS_06 identified in D3.2 and stated in the previous paragraphs have been fully implemented. Further to these, the following requirement was identified during project workshops and considered in the PublicSonar platform.

Attribute	Description
Unique ID	SR_F_PS_07
Priority	Could
Description	Multilingual sentiment analysis of crowdsourced data
Rationale	CPA to use social media information for situation assessment.
Fit Criterion	Crowdsourcing of social media.
Relevant User Requirement(s)	N/A (not assigned to a specific user requirement, but derived from discussions with project partners and end-users)

TABLE 61: SYSTEM REQUIREMENT FOR ID SR_F_PS_07

With PublicSonar platform, CPAs can crowdsource information to collect relevant insights about ongoing events or incidents. It was agreed to play towards PublicSonar's strengths (crowdsourcing) and build deep integrations with the RiskPACC platform, so that two-way communication was ensured leveraging PublicSonar's crowdsourced data. The requirements presented in the following Tables have been added and updated the requirements SR_F_PS_03, SR_F_PS_04, and SR_F_PS_05 mentioned in Section 4.3.2.1, to reflect this change in direction.

Attribute	Description
Unique ID	SR_F_PS_08
Priority	Could
Description	Crowdsourced data API
Rationale	Riskpacc toolbox to leverage Publicsonar data to populate maps and data feeds.
Fit Criterion	Deep integration between tools
Relevant User Requirement(s)	N/A (not assigned to a specific user requirement, but derived from discussions with project partners and end-users)

TABLE 62: SYSTEM REQUIREMENT FOR ID SR_F_PS_08

Attribute	Description
Unique ID	SR_F_PS_09
Priority	Could
Description	Publicsonar toolkit integration
Rationale	Riskpacc users to seamlessly navigate between tools with a single login.
Fit Criterion	Deep integration between tools
Relevant User Requirement(s)	N/A (not assigned to a specific user requirement, but derived from discussions with project partners and end-users)

TABLE 63: SYSTEM REQUIREMENT FOR ID SR_F_PS_09

Attribute	Description
Unique ID	SR_F_PS_03
Priority	Could
Description	CPA to send information to citizens, but also to crowdsource social media.
Rationale	Better distribution of safety information and the possibility of using it for educating citizens online; access information provided by citizens.
Fit Criterion	Crowdsource information via social media. CPA to collect information from citizens about occurring events.
Relevant User Requirement(s)	CTo05

TABLE 64: SYSTEM REQUIREMENT FOR ID SR_F_PS_10 (UPDATING ID SR_F_PS_03 MENTIONED ABOVE)

Attribute	Description
Unique ID	SR_F_PS_04
Priority	Should
Description	Enhanced and concentrated use of social media by several CPAs.
Rationale	More concerted use of social media in multi-agency settings.
Fit Criterion	Crowdsourse information from citizens.
Relevant User Requirement(s)	LCTo3

TABLE 65: SYSTEM REQUIREMENT FOR ID SR_F_PS_11 (UPDATING SR_F_PS_04 MENTIONED ABOVE)

Attribute	Description
Unique ID	SR_F_PS_05
Priority	Must
Description	CPA to gain geographical incident awareness via app/social media.
Rationale	Enhance collaboration between CPAs and citizen volunteers that can be called on in a crisis.
Fit Criterion	Situational awareness of an affected area via the use of satellite maps.
Relevant User Requirement(s)	LCTo6

TABLE 66: SYSTEM REQUIREMENT FOR ID SR_F_PS_12 11 (UPDATING SR_F_PS_05 MENTIONED ABOVE)

4.2.4 VGI Solutions [UT]

The VGI solutions are web-based tools with the focus on improving the understanding of VGI, specifically of how to assess volunteer suitability for a given task, match the volunteers based on a mapping of the cognitive load of a given task, how to instruct a volunteer, and to monitor progress and validate submissions. This addresses the problem that most existing VGI tools and approaches only focus on data flows and use of the information provided by volunteers, while largely ignoring the limitations in the initial information generation just mentioned.

Based on the case study-specific needs assessment the first phase of the work comprised the development of two simple ICT tools to facilitate human factors and cognitive systems engineering experiments, also incorporating research into how best to merge volunteer submissions and machine learning, as well as gamification as a means to improve training, but also volunteers retention. One of those tools will address collaborative image-based mapping by remotely located volunteers, the other focus on app-based tasked data acquisition by volunteers based within the area of the case study area.

4.2.4.1 Mapping Damage Tool (MD) [UT]

The Damage Mapping tool was developed together with the Greek Center for Security Studies (KEMEA) and the Municipality of Rafina-Pikermi, Greece, and focus on understanding better how risk- and disaster-related volunteer contributions can best support Civil Protection Authorities (CPAs). The process of identifying suitable volunteers, and instructing and guiding them appropriately, is not easy, and not well understood, yet this is critical to generate useful information. In this tool two different mapping activities were set up, one focusing on flooding, the other on wildfire. They are implemented in a platform called GeoCitizen, designed for volunteer contributions. It is desktop-based, though also supports field-based mapping. The tool was prepared for areas relevant to the RiskPACC CPAs, therefore it is focused on the region of Attica, and the GeoCitizen platform limits the mapping to the predefined area, though the tool can also be set up for other areas. External municipalities can test and gain information on how the questionnaire-based mapping

approach works, and how volunteers are used to create the geoinformation.

Both wildfire and flood surveys include questions that are either related to pre-disaster preparedness, or to post-event damage detection. Users are asked to specify a category, such as greenery, after which they are presented with an interactive map that contains relevant green areas identified by the CPAs. For selected green areas information on the state of the area, such as natural reforestation (pre-disaster) or severely burnt (post-disaster) can be assigned, and a field photo uploaded if available.

4.2.4.2 Thermal Comfort Tracker Tool (TCT) [UT]

The tool was developed together with the Municipality of Padua that has been working on reducing heat hazard in the city. The purpose of the survey is to obtain information on how people in a given situation perceive their personal thermal situation. At the time of development, the municipality was planning to install a number of indoor temperature and humidity sensors, as this is needed to place the thermal perception of residents in appropriate context. However, the city later decided the install a network of external sensors throughout the city instead, and this is supported by a more elaborate thermal volunteer-based perception survey outside this tool.

The existing Thermal Comfort Tracker tool was developed and adapted to the region of Padua and can therefore not simply be used and applied by other municipalities, but the research elements may still be relevant for other municipalities. To explore the tool and determine whether such an approach would be of interest to your municipality, users can create a GeoCitizen account (https://app.geocitizen.org). As mentioned, the tool was developed for Padua and therefore this area is also displayed when the tool is opened. But the setup itself - how to assess thermal comfort and thermal perception - has a clear scientific basis, and this also provides external municipalities with insights on how to gain such knowledge.

Therefore, municipalities interested in learning more about how thermal comfort information can be used together with physical temperature and humidity measurements, and also couple this with digital modelling, can contact the University of Twente for more information.

4.2.4.3 The initially identified system requirements of the VGI Tools

Initially, the generic system requirements for the two VGI solutions were identified. These initial system requirements, as reported in D3.2, are presented in the following.

Attribute	Description
Unique ID	SR_F_VGI_01
Priority	Should
Description	Volunteers can provide geo-data information at the location of relevance.
Rationale	Tasked local mapping by volunteers.
Fit Criterion	Volunteers can conduct useful monitoring and provide relevant data.
Relevant User Requirement(s)	ATo6

TABLE 67: SYSTEM REQUIREMENT FOR ID SR_F_VGI_01

Attribute	Description
Unique ID	SR_F_VGI_02
Priority	Should
Description	User to contribute to local vulnerability mapping through app and gamified questionnaires.
Rationale	Local crowdbased vulnerability mapping.
Fit Criterion	Users can contribute to vulnerability mapping.
Relevant User Requirement(s)	ATo7

TABLE 68: SYSTEM REQUIREMENT FOR ID SR_F_VGI_02

Attribute	Description
Unique ID	SR_F_VGI_03
Priority	Should
Description	Post-disaster damage mapping including images. User to contribute to damage mapping after respective call by the CPA.
Rationale	Application could be used to train people and use the damage mapping as an entry point for two-way communication.
Fit Criterion	Crowdbased damage mapping.
Relevant User Requirement(s)	ATo8

TABLE 69: SYSTEM REQUIREMENT FOR ID SR_F_VGI_03

Attribute	Description
Unique ID	SR_F_VGI_04
Priority	Could
Description	Establishing joint VGI-based mapping approaches, enhancing two-way communication between citizens and CPAs.
Rationale	Citizens to contribute to local mapping approaches.
Fit Criterion	Receive targeted information from the citizen but also "use" mapping for training purposes.
Relevant User Requirement(s)	CTo08

TABLE 70: SYSTEM REQUIREMENT FOR ID SR_F_VGI_04

Attribute	Description
Unique ID	SR_F_VGI_05
Priority	Should
Description	Users to be involved in mapping activities for local preparedness purposes.
Rationale	VGI local preparedness mapping.
Fit Criterion	Training content to be translated into mapping exercises.
Relevant User Requirement(s)	ETo06

TABLE 71: SYSTEM REQUIREMENT FOR ID SR_F_VGI_05

Attribute	Description
Unique ID	SR_F_VGI_06
Priority	Should
Description	Users to contribute to vulnerability maps.
Rationale	CPA to integrate more detailed information into vulnerability maps.
Fit Criterion	Volunteers/citizens to be involved in vulnerability mapping.
Relevant User Requirement(s)	ETo07, LCTo5

TABLE 72: SYSTEM REQUIREMENT FOR ID SR_F_VGI_06

4.2.4.4 Updates and final system requirements of the Mapping Damage tool

All the system requirements identified in D3.2 and stated in Section 4.2.4.3 apply to the Mapping Damage tool and have been fully implemented for this tool.

4.2.4.5 Updates and final system requirements of the Thermal Comfort Tracker tool

Out of all system requirements identified in D3.2 and stated in Section 4.2.4.3, the requirements SR_F_VGI_01, SR_F_VGI_02, SR_F_VGI_05 and SR_F_VGI_06, apply to the Thermal Comfort Tracker tool and have been fully implemented for this tool. Especially for SR_F_VGI_04, the tool collects thermal comfort information by citizens at a specific location, but does not facilitate an actual two-way communication, it is essentially an information gathering tool, though engaging with it also leads to greater awareness of user vulnerabilities to heat hazard, hence serves a training function. For this reason, SR_F_VGI_04 has not been implemented.

The actual thermal comfort tracker VGI tool was also expanded to include an additional tool, based on a Digital Twin model of an area in Padua that is affected by strong heat hazard. The model is interactive, and allows CPA users to simulate different nature-based solutions, such as planting trees, or implementing roof greening, and to quantify the effect in terms of actual physical cooling of the surroundings. Thermal perception data from the original app can be linked and incorporated. In addition, a few additional requirements were defined together with the CPA, and are met in the current model.

Attribute	Description
Unique ID	SR_F_TCT_01
Priority	Should
Description	It must be possible to incorporate real-time temperature and humidity data from the sensor network installed across the city.
Rationale	The digital twin simulation model needs to be based on actual physical temperature data.
Fit Criterion	Temperature and humidity data layers for any recorded date/time moment can be incorporated in the model and be displayed.
Relevant User Requirement(s)	N/A (not assigned to a specific user requirement, but derived from discussions with project partners and end-users and end-users)

TABLE 73: SYSTEM REQUIREMENT FOR ID SR_F_TCT_01

Attribute	Description
Unique ID	SR_F_TCT_02
Priority	Should
Description	The model is interactive, allowing different nature-based solutions to be included in select places, while dynamically providing feedback on the thermal effects.
Rationale	The digital twin simulation model needs to be dynamic, allowing different scenarios to be tested in real time.
Fit Criterion	The effect on the Physical Equivalent Temperature (PET) of selected nature-based solutions is dynamically calculated.
Relevant User Requirement(s)	N/A (not assigned to a specific user requirement, but derived from discussions with project partners and end-users)

TABLE 74: SYSTEM REQUIREMENT FOR ID SR_F_TCT_02

4.3 Common and General Requirements

This section lists 'soft' requirements that are shared among all the tools and platform components horizontally. A number of these requirements are revolving around the project's infrastructure, while others were initially (D3.2) presented in a more abstract form as they would be shaped at a later stage and their final version is presented in this report. These soft requirements do not emerge directly from the user requirements, but based on DoA and/or interactions with project partners, and provide general characteristics that the RiskPACC system needed to follow. For the majority of these requirements the higher priority level has been assigned based on the end user feedback.

4.3.1 Initial Functional Requirements

4.3.1.1 Authentication server requirements

Attribute	Description
Unique ID	SR_F_AUTH_01
Priority	Must
Description	Log user activity.
Rationale	Data collected might be sensitive and security must always be guaranteed.
Fit Criterion	All access is logged for traceability and to assure GDPR.
Relevant User Requirement(s)	N/A (not assigned to a specific user requirement but derived from discussion with project partners)

TABLE 75: SYSTEM REQUIREMENT FOR ID SR_F_AUTH_01

Attribute	Description
Unique ID	SR_F_AUTH_02
Priority	Must
Description	Login using username/password. Personalized logins to access information and encrypted transmission could provide for security.
Rationale	The security of all the data collected and the transmission of these data must be guaranteed.
Fit Criterion	The systems require username/password to login.
Relevant User Requirement(s)	N/A (not assigned to a specific user requirement but derived from discussion with project partners)

TABLE 76: SYSTEM REQUIREMENT FOR ID SR_F_AUTH_02

Attribute	Description
Unique ID	SR_F_AUTH_03
Priority	Must
Description	A user wants to reset a forgotten password.
Rationale	It must be possible to be able to reset a forgotten password.
Fit Criterion	A user can reset a forgotten password.
Relevant User Requirement(s)	N/A (not assigned to a specific user requirement but derived from discussion with project partners)

TABLE 77: SYSTEM REQUIREMENT FOR ID SR_F_AUTH_03

Attribute	Description
Unique ID	SR_F_AUTH_04
Priority	Must
Description	An administrator wants to create a user.
Rationale	It must be possible to be able to create a user.
Fit Criterion	An administrator can create a user.
Relevant User Requirement(s)	N/A (not assigned to a specific user requirement but derived from discussion with project partners)

TABLE 78: SYSTEM REQUIREMENT FOR ID SR_F_AUTH_04

Attribute	Description
Unique ID	SR_F_AUTH_05
Priority	Must
Description	An administrator wants to list all users.
Rationale	It must be possible to be able to list all users.
Fit Criterion	An administrator can list all users.
Relevant User Requirement(s)	N/A (not assigned to a specific user requirement but derived from discussion with project partners)

TABLE 79: SYSTEM REQUIREMENT FOR ID SR_F_AUTH_05

Attribute	Description
Unique ID	SR_F_AUTH_06
Priority	Must
Description	An administrator wants to view user information.
Rationale	It must be possible to be able to view a user's info.
Fit Criterion	An administrator can view user information.
Relevant User Requirement(s)	N/A (not assigned to a specific user requirement but derived from discussion with project partners)

TABLE 80: SYSTEM REQUIREMENT FOR ID SR_F_AUTH_06

Attribute	Description
Unique ID	SR_F_AUTH_07
Priority	Must
Description	An administrator wants to edit user information.
Rationale	It must be possible to be able to edit a user's info.
Fit Criterion	An administrator can edit user information.
Relevant User Requirement(s)	N/A (not assigned to a specific user requirement but derived from discussion with project partners)

TABLE 81: SYSTEM REQUIREMENT FOR ID SR_F_AUTH_07

Attribute	Description
Unique ID	SR_F_AUTH_08
Priority	Must
Description	An administrator wants to delete a user.
Rationale	It must be possible to be able to delete a user.
Fit Criterion	An administrator can delete a user.
Relevant User Requirement(s)	N/A (not assigned to a specific user requirement but derived from discussion with project partners)

TABLE 82: SYSTEM REQUIREMENT FOR ID SR_F_AUTH_08

4.3.1.2 Digital data server requirements

Attribute	Description
Unique ID	SR_F_SERV_01
Priority	Must
Description	Store all the data produced.
Rationale	All data collected and transmitted by components/systems must be stored and be available for post processing, i.e., in a database that is easy to extract information from.
Fit Criterion	All data produced is stored.
Relevant User Requirement(s)	N/A (not assigned to a specific user requirement but derived from discussion with project partners)

TABLE 83: SYSTEM REQUIREMENT FOR ID SR_F_SERV_01

4.3.2 Initial Non-Functional Requirements

A non-functional requirement is a specification that describes the system's operation capabilities and constraints that enhance its functionality. In the RiskPACC case they have emerged from interviews with the case studies. Through this process, each partner has selected a priority level for each requirement, but for the compilation of this document, the higher priority has been selected. Additionally, some requirements have a more diverse application hence they have not been part of discussion with the Case Studies and a value of "Not Applicable (N/A)" has been selected.

4.3.2.1 Language requirements

Attribute	Description
Unique ID	SR_NF_LANG_01
Priority	Must
Description	Different languages need to be provided.
Rationale	Broaden the accessibility and reduce language barriers.
Fit Criterion	User should be able to select different languages (and use in local language).
Relevant User Requirement(s)	CTo07

TABLE 84: SYSTEM REQUIREMENT FOR ID SR_NF_LANG_01

4.3.2.2 Usability requirements

Attribute	Description
Unique ID	SR_NF_USE_01
Priority	Should
Description	User to use solutions intuitively and without a lot of explanation.
Rationale	Most users will not work in the application on a day-to-day basis and it needs to be intuitive on how to handle. Minimum or no training should be required.
Fit Criterion	Tools can be easily used.
Relevant User Requirement(s)	ITo5

TABLE 85: SYSTEM REQUIREMENT FOR ID SR_NF_USE_01

Attribute	Description
Unique ID	SR_NF_USE_02
Priority	Should
Description	Barrier-reduction.
Rationale	Solutions also to be used by impaired people, people with low technological literacy (elderly, etc.).
Fit Criterion	Apply pictograms, local language, scalability of font size etc. wherever possible.
Relevant User Requirement(s)	ITO5

TABLE 86: SYSTEM REQUIREMENT FOR ID SR_NF_USE_02

Attribute	Description
Unique ID	SR_NF_USE_03
Priority	Should
Description	Limited number of services.
Rationale	User to select from a limited number of functionalities.
Fit Criterion	Solutions should not be too encompassing but focus on some and easy to understand functionalities/services.
Relevant User Requirement(s)	ITO1

TABLE 87: SYSTEM REQUIREMENT FOR ID SR_NF_USE_03

Attribute	Description
Unique ID	SR_NF_USE_04
Priority	Should
Description	Volunteers to access training material in a playful way.
Rationale	Gamified approaches for training about own preparedness.
Fit Criterion	Adopt gamification techniques.
Relevant User Requirement(s)	ETo05, ITO4a

TABLE 88: SYSTEM REQUIREMENT FOR ID SR_NF_USE_04

Attribute	Description
Unique ID	SR_NF_USE_05
Priority	Must
Description	Citizens to be able to browse through different application sections and select the material they want to consume.
Rationale	Increases accessibility and repeatability.
Fit Criterion	Material is organised nicely.
Relevant User Requirement(s)	ITO1, ITO2, ITO3

TABLE 89: SYSTEM REQUIREMENT FOR ID SR_NF_USE_05

4.3.2.3 Technical requirements

Attribute	Description
Unique ID	SR_NF_TECH_01
Priority	Must
Description	Storing of data in local servers.
Rationale	Platform data should be safely stored in local servers.
Fit Criterion	Local saving of data.
Relevant User Requirement(s)	Requirement derived from project partners

TABLE 90: SYSTEM REQUIREMENT FOR ID SR_NF_TECH_01

Attribute	Description
Unique ID	SR_NF_TECH_02
Priority	Must
Description	The citizens may upload media that capture a situation that needs attention from the CPA. This data can be assessed for usefulness and credibility.
Rationale	The crowdsourced information/material can prove vital when making decisions about public safety, but the CPA needs to control and validate the data/information uploaded to the platform by citizens.
Fit Criterion	Data control and validation.
Relevant User Requirement(s)	ITo2

TABLE 91: SYSTEM REQUIREMENT FOR ID SR_NF_TECH_02

Attribute	Description
Unique ID	SR_NF_TECH_03
Priority	Must
Description	Platform compatible with Android Operating System (OS). Potential compatibility with other OSs will also be explored in the future.
Rationale	Several devices to be interoperable with platform.
Fit Criterion	Interoperability of devices.
Relevant User Requirement(s)	Requirement derived from project partners

TABLE 92: SYSTEM REQUIREMENT FOR ID SR_NF_TECH_03

Attribute	Description
Unique ID	SR_NF_TECH_04
Priority	Must
Description	Interconnection with national local services to integrate additional information and data.
Rationale	Already available services should be able to be integrated into the platform.
Fit Criterion	Integration of existing services for data, warnings etc. should be possible.
Relevant User Requirement(s)	CTo03

TABLE 93: SYSTEM REQUIREMENT FOR ID SR_NF_TECH_04

Attribute	Description
Unique ID	SR_NF_TECH_05
Priority	Should
Description	App based solutions so they can be used on phones.
Rationale	User to access tools/services via mobile phone.
Fit Criterion	App-based services.
Relevant User Requirement(s)	PTo10

TABLE 94: SYSTEM REQUIREMENT FOR ID SR_NF_TECH_05

4.3.2.4 Ethical and legal requirements

Attribute	Description
Unique ID	SR_NF_EL_01
Priority	N/A (not priority level has been currently provided by end users)
Description	Barrier-free and easy access.
Rationale	Using well-designed user interfaces, instructions, and authentication.
Fit Criterion	Ensure equal and non-discriminatory access to technology and its support services.
Relevant User Requirement(s)	N/A (not assigned to a specific user requirement but derived from discussion with project partners)

TABLE 95: SYSTEM REQUIREMENT FOR ID SR_NF_EL_01

Attribute	Description
Unique ID	SR_NF_EL_02
Priority	N/A (not priority level has been currently provided by end users)
Description	User to get access to their data.
Rationale	Provide a self-service portal where the data subject can get access to their data.
Fit Criterion	Right of access.
Relevant User Requirement(s)	N/A (not assigned to a specific user requirement but derived from discussion with project partners)

TABLE 96: SYSTEM REQUIREMENT FOR ID SR_NF_EL_02

Attribute	Description
Unique ID	SR_NF_EL_03
Priority	N/A (not priority level has been currently provided by end users)
Description	User to delete personal data.
Rationale	Build capabilities for deleting personal data.
Fit Criterion	Right to be forgotten (according to data subject rights).
Relevant User Requirement(s)	N/A (not assigned to a specific user requirement but derived from discussion with project partners)

TABLE 97: SYSTEM REQUIREMENT FOR ID SR_NF_EL_03

Attribute	Description
Unique ID	SR_NF_EL_04
Priority	N/A (not priority level has been currently provided by end users)
Description	Services and data are protected.
Rationale	Deploy the functionalities related to cyber security.
Fit Criterion	Protection of services and data.
Relevant User Requirement(s)	N/A (not assigned to a specific user requirement but derived from discussion with project partners)

TABLE 98: SYSTEM REQUIREMENT FOR ID SR_NF_EL_04

Attribute	Description
Unique ID	SR_NF_EL_05
Priority	N/A (not priority level has been currently provided by end users)
Description	User to provide consent for use of personal data.
Rationale	Capabilities for asking consent as part of the service and that the consent is documented properly (obligatory).
Fit Criterion	Ethical and legal principles.
Relevant User Requirement(s)	N/A (not assigned to a specific user requirement but derived from discussion with project partners)

TABLE 99: SYSTEM REQUIREMENT FOR ID SR_NF_EL_05

Attribute	Description
Unique ID	SR_NF_EL_06
Priority	N/A (not priority level has been currently provided by end users)
Description	Erase, pseudonymise, or anonymise data.
Rationale	Technical capabilities to erase, pseudonymise, or anonymise personal data after the relevant data retention period. Ensure that data will be removed from all systems. Define automated functions if this is possible.
Fit Criterion	Protection of data storage, minimisation of data, as well as minimisation of duration of data storage.
Relevant User Requirement(s)	N/A (not assigned to a specific user requirement but derived from discussion with project partners)

TABLE 100: SYSTEM REQUIREMENT FOR ID SR_NF_EL_06

Attribute	Description
Unique ID	SR_NF_EL_07
Priority	N/A (not priority level has been currently provided by end users)
Description	Retrieve sources of data.
Rationale	Ensure that the source of the data is recorded.
Fit Criterion	Data accuracy.
Relevant User Requirement(s)	N/A (not assigned to a specific user requirement but derived from discussion with project partners)

TABLE 101: SYSTEM REQUIREMENT FOR ID SR_NF_EL_07

4.3.2.5 Digital data server requirements

Attribute	Description
Unique ID	SR_NF_SERV_01
Priority	N/A (not priority level has been currently provided by end users)
Description	Supports encrypted transmission (SSL, TLS, SSH, VPN, etc.)
Rationale	The security of all the data collected and the transmission of these data must be guaranteed.
Fit Criterion	Data security must always be guaranteed to assure that sensitive data and information collected is not spread or disclosed.
Relevant User Requirement(s)	N/A (not assigned to a specific user requirement but derived from discussion with project partners)

TABLE 102: SYSTEM REQUIREMENT FOR ID SR_NF_SERV_01

Attribute	Description
Unique ID	SR_NF_SERV_02
Priority	N/A (not priority level has been currently provided by end users)
Description	Supports encrypted storage (TDE, EFS, etc.)
Rationale	The security of all the data collected must be guaranteed.
Fit Criterion	Data security must be guaranteed.
Relevant User Requirement(s)	N/A (not assigned to a specific user requirement but derived from discussion with project partners)

TABLE 103: SYSTEM REQUIREMENT FOR ID SR_NF_SERV_02

Attribute	Description
Unique ID	SR_NF_SERV_03
Priority	N/A (not priority level has been currently provided by end users)
Description	The server could support data redundancy and automated back-up processes.
Rationale	To ensure no data is lost, it may be prudent to host the DBMS in a physical machine that supports data redundancy (e.g., RAID), or has automated back-up processes in an external (i.e. located at a different server) drive.
Fit Criterion	Support of a data redundancy technology and/or of automated backups.
Relevant User Requirement(s)	N/A (not assigned to a specific user requirement but derived from discussion with project partners)

TABLE 104: SYSTEM REQUIREMENT FOR ID SR_NF_SERV_03

Attribute	Description
Unique ID	SR_NF_SERV_04
Priority	N/A (not priority level has been currently provided by end users)
Description	The DBMS must provide data security. Access to the data should be restricted.
Rationale	Data must only be edited and deleted by the administrator and new data must be inserted only by authorised parties. However, data should also be open and easily accessible with a RESTful API.
Fit Criterion	C operation only by authorized entities; R operation by all; UD only by admin.
Relevant User Requirement(s)	N/A (not assigned to a specific user requirement but derived from discussion with project partners)

TABLE 105: SYSTEM REQUIREMENT FOR ID SR_NF_SERV_04

Attribute	Description
Unique ID	SR_NF_SERV_05
Priority	N/A (not priority level has been currently provided by end users)
Description	The system must be able to grow and change in time.
Rationale	User feedback or increasing operational demands need to be covered.
Fit Criterion	Is easily scalable (in content), expandable (in functionalities) and adaptable (to changes in policy and legislation).
Relevant User Requirement(s)	N/A (not assigned to a specific user requirement but derived from discussion with project partners)

TABLE 106: SYSTEM REQUIREMENT FOR ID SR_NF_SERV_05

Attribute	Description
Unique ID	SR_NF_SERV_06
Priority	N/A (not priority level has been currently provided by end users)
Description	The DBMS must be able to handle heterogeneous input data (images, videos, etc.).
Rationale	The solution envisages a use of a central database for all of the data hence, one must be able to store a variety of data types.
Fit Criterion	Use of a NoSQL database to facilitate the easy integration of data.
Relevant User Requirement(s)	N/A (not assigned to a specific user requirement but derived from discussion with project partners)

TABLE 107: SYSTEM REQUIREMENT FOR ID SR_NF_SERV_06

4.3.2.6 General requirements

Attribute	Description
Unique ID	SR_NF_GEN_01
Priority	N/A (not priority level has been currently provided by end users)
Description	Compliant with National and EU regulations (including GDPR).
Rationale	The GDPR is an important component of EU privacy law and of human rights law. The GDPR's primary aim is to enhance individuals' control and rights over their personal data and to simplify the regulatory environment for international business.
Fit Criterion	The systems are GDPR-compliant.
Relevant User Requirement(s)	N/A (not assigned to a specific user requirement but derived from discussion with project partners)

TABLE 108: SYSTEM REQUIREMENT FOR ID SR_NF_GEN_01

Attribute	Description
Unique ID	SR_NF_GEN_02
Priority	N/A (not priority level has been currently provided by end users)
Description	Can be used by many users simultaneously.
Rationale	During an event of crisis, it is very important to be able provide vital services to all the users that require them simultaneously.
Fit Criterion	The systems' functionalities can be used by many users simultaneously.
Relevant User Requirement(s)	N/A (not assigned to a specific user requirement but derived from discussion with project partners)

TABLE 109: SYSTEM REQUIREMENT FOR ID SR_NF_GEN_02

Attribute	Description
Unique ID	SR_NF_GEN_03
Priority	N/A (not priority level has been currently provided by end users)
Description	Real time processing.
Rationale	The interaction with the tools, the feedback loop, and the information representation need to happen in real time or near real time.
Fit Criterion	If information presented by GUI or the tool is not fast enough, it may pose a danger to involved persons.
Relevant User Requirement(s)	N/A (not assigned to a specific user requirement but derived from discussion with project partners)

TABLE 110: SYSTEM REQUIREMENT FOR ID SR_NF_GEN_03

Attribute	Description
Unique ID	SR_NF_GEN_04
Priority	N/A (not priority level has been currently provided by end users)
Description	GPS coordinates provided using the WGS 84 coordinate system.
Rationale	WGS 84 is a commonly used standard.
Fit Criterion	The coordinates are provided using the WGS 84 coordinate system.
Relevant User Requirement(s)	N/A (not assigned to a specific user requirement but derived from discussion with project partners)

TABLE 111: SYSTEM REQUIREMENT FOR ID SR_NF_GEN_04

Attribute	Description
Unique ID	SR_NF_GEN_05
Priority	N/A (not priority level has been currently provided by end users)
Description	All data objects should have a timestamp.
Rationale	It would facilitate logging and action tracking.
Fit Criterion	Data objects have a timestamp.
Relevant User Requirement(s)	N/A (not assigned to a specific user requirement but derived from discussion with project partners)

TABLE 112: SYSTEM REQUIREMENT FOR ID SR_NF_GEN_05

Attribute	Description
Unique ID	SR_NF_GEN_06
Priority	N/A (not priority level has been currently provided by end users)
Description	The systems are always available.
Rationale	The systems involved are used in critical situations.
Fit Criterion	Systems have high uptime.
Relevant User Requirement(s)	N/A (not assigned to a specific user requirement but derived from discussion with project partners)

TABLE 113: SYSTEM REQUIREMENT FOR ID SR_NF_GEN_06

4.3.3 Updates and Final System Requirements

The system requirements identified in D3.2 and stated in the previous paragraphs have been fully implemented and updated with the requirements presented in the following. It is noted that GDPR-compliance is exclusively ensured through system requirement ID SR_NF_GEN_01. Therefore, system requirement ID SR_F_AUTH_01 has been erroneously formulated and no need for its implementation has risen.

4.3.3.1 Authentication server requirements (Functional requirements)

Attribute	Description
Unique ID	SR_F_AUTH_09
Priority	Must
Description	A user wants to delete his/her account.
Rationale	It must be possible for a user to delete his account.
Fit Criterion	A user can delete his/her account.
Relevant User Requirement(s)	N/A (not assigned to a specific user requirement but derived from discussion with project partners and end-users)

TABLE 114: SYSTEM REQUIREMENT FOR ID SR_F_AUTH_09

It is clarified here that the initially identified system requirement SR_NF_EL_03 is also addressed with the account deletion feature that is implemented with the system requirement SR_F_AUTH_09.

Attribute	Description
Unique ID	SR_F_AUTH_10
Priority	Must
Description	A user wants to skip the login process if another authentication session is active.
Rationale	This feature provides a more convenient user experience by reducing the need to re-enter credentials. It enhances usability and encourages more frequent use of the application.
Fit Criterion	When a user revisits the application, the system should automatically authenticate them if a valid token is present.
Relevant User Requirement(s)	N/A (not assigned to a specific user requirement but derived from discussion with project partners and end-users)

TABLE 115: SYSTEM REQUIREMENT FOR ID SR_F_AUTH_10

4.3.3.2 Language requirements (Non-functional requirements)

Attribute	Description
Unique ID	SR_NF_LANG_02
Priority	Must
Description	The option to also add text in Hebrew language.
Rationale	Broaden the accessibility to partners from the Eilat case study.
Fit Criterion	User should be able to select editing using Hebrew language.
Relevant User Requirement(s)	N/A (not assigned to a specific user requirement but derived from discussion with project partners and end-users)

TABLE 116: SYSTEM REQUIREMENT FOR ID SR_NF_LANG_02

It is clarified here that the initially identified system requirement SR_NF_USE_02 (in terms of local language as a fit criterion) is also addressed with the support of Hebrew user text input feature that is implemented with the system requirement SR_NF_LANG_02.

5 CONCLUSIONS

The analysis presented in this deliverable aimed at outlining the final version of RiskPACC system requirements. All the characteristics of the RiskPACC components that needed to be addressed and the interpretation of the user needs into functional and non- functional specifications are included in this document.

The end user requirements were initially recorded and an outline was provided in Deliverable D3.2. The initial user requirements served as input to provide a better understanding of the end users' specific way of working in the risk field and to explain why certain requirements were set, and were used to be able to translate the requirements into technical specifications on the system. The initial requirements were translated into initial system requirements. The methodology that was employed for the definition of system requirements involved the decomposition of the envisaged RiskPACC system into subsystems in order to analyse the requirements that needed to be met from various aspects (technical, ethical, *etc*.). Following this process, a set of 93 initial system requirements were defined in total, which were classified into *static* components, *dynamic* components and other common and general requirements. The initial system requirements kept being discussed, elaborated, refined and when necessary updated during the whole project lifetime.

Yet, the identification of requirements is a dynamic and iterative process that evolved during project implementation and some characteristics of the various components were updated. The refinement and update of the system requirements followed interaction with case study owners (primarily during co-creation activities and targeted WP3 workshops), interactions with external cities (during WP6 workshops, webinars and relevant activities) and continuous interactions among project partners. Static requirements coming from DoA and generic, horizontal requirements were always considered during these interactions.

This document is the final version of the system requirements and functional specifications definition that have been used for the development of the different RiskPACC platform and tools components. This final report consolidates initial requirements and further updates and refinements, delivering the updated and final specifications of each one of the RiskPACC system components, along with any modifications that had to be made.

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7 ANNEX I

TABLE 117: USER REQUIREMENTS FOR MRP CASE STUDY

Case study	Context	Req.ID	Tools Requirements	Priority (Must, need, nice to have)	User scenario	Group	Type of Requirement	Function text	Requirement text	Rational text
MRP	**Tool to facilitate education and training about wildfires**	ATo1	Evacuation planning: training material to facilitate the understanding of maps and evacuation routes	Need	Access and use the training material	CPA	Functional	Integration of training material to facilitate the understanding evacuation plans and maps	CPA to be able to include plans into too	CPA to communicate risk management information
		ATo2a	Explain about interconnectedness between wildfires and flood risks: information material	Must	User to access information material	Citizens	Functional	Information access	Integration of information/videos	Citizens to learn about interconnectedness
		ATo2b	Explain about interconnectedness between wildfires and flood risks: training material and potentially quiz/game	Nice to have	User to access training material/quiz	Citizens	Functional	Access to training material, quiz	Integration of training material/quiz	CPA to inform citizens
		ATo3	Integrating training material and procedures for volunteers	Need	Volunteers to access training material and guidelines	CPAs, volunteers	Functional	Access to guidelines and training material	Volunteers should be able to access training and guidance material	Central information space for volunteers
		ATo4	Access through a mobile app of historical information about disasters	Need	Users to access historical information at disaster areas	CAPs, volunteers	Functional	Access to historical information	User to access historical information about disaster that have happened in the case study	User to be educated about previous disasters in the area
		ATo5	Crowdsourcing for environmental assessment	Need	Users (as sensor) to be able to use specific functionalities of a tool to send and receive information about risks	CPAs and citizens	Non-functional	Access to tool functionalities that offer identify and communicate risks	CPAs/Citizens to be able to send-receive information about climatic risks	CPA/Citizens to communicate risks

Case study	Context	Req.ID	Tools Requirements	Priority (Must, need, nice to have)	User scenario	Group	Type of Requirement	Function text	Requirement text	Rational text
	VGI approaches | crowdsourcing from community with training and education purpose or side-effect	ATo6	Tasked local mapping by volunteers	Need	User to integrate information/data at the location of relevance	Citizens	Functional	Integration of geo-data by local digital volunteers	Integration of information/videos	There are two aims: 1) monitoring of certain points of interest and 2) training/education of citizens; Functionality could/should link with training section
		ATo7	Local vulnerability mapping	Need	User to contribute to local vulnerability mapping through app and gamified questionnaires	Citizens	Functional	Crowd-based vulnerability mapping	User to contribute to local vulnerability mapping through app and gamified questionnaires	Integration of citizens into vulnerability mapping
		ATo8	Post-disaster damage mapping - including images	Need	User to contribute to damage mapping through app	Citizen	Functional	Crowd-based damage mapping	User to contribute to damage mapping after respective call by the CPA	Involve citizens in damage mapping
	Communication tool facilitating two-way communication	ATo9	Communication between CPAs and citizens during a hazardous event through an application	Must	CPAs and citizens are able to send and receive messages to each other	Citizens and CPAs	Functional	Messaging service	CPAs to send messages to citizens; citizens to issue messages (e.g. on needs) and information on the local hazard situation; also relates to dynamic platform requirements CSCM01-CSCM04	enhance communication between citizens and CPAs during the response phase
		ATo10	Enhance communication between stakeholders	Need	Different authorities have access to the platform/tool and can process information	CPAs	Functional	Different user groups	Platform/tool should connect with different DRM authorities	Enhance collaboration between authorities and align communication to citizen

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Case study	Context	Req.ID	Tools Requirements	Priority (Must, need, nice to have)	User scenario	Group	Type of Requirement	Function text	Requirement text	Rational text
		ATo11	Specific alerts for local organised volunteer teams	Need	CPA to send dedicated alerts/instructions to teams	CPAs and citizens	Functional	Send specific alerts to volunteers	Specific alert function for volunteers who need to be registered	CPA to send specific information/tasks to volunteer groups
		ATo12	Integration of warning tool GI Polis	Nice to have	Integrate existing warning system	CPA	Non-functional	Integrate existing tool GI Polis	GI Polis alerts to be integrated	one-way warning system already exists and could be integrated
		ATo13	Possibility to collaborate with volunteers	Must	Non-organised volunteers to receive information/instructions to support CPA	CPA and citizens	Functional	Specific information for non-organised volunteers	Non-organised volunteers to receive dedicated information/instructions	CPA to send information to non-organised volunteers or give instructions
		ATo14	Send information on the nearest assembly point	Need	Maps containing information for citizen	Citizens and CPAs	Functional	Maps and geo-references information	Maps and geo-references information to be integrated into the communication app	Citizens should be able to access maps including hazards information and response instructions
		ATo15	Alert about the end of the event	Need	General alerting I warning functions	CPAs	Functional	Alerting function	CPAs to alert citizens including the end of an event	CPAs to send important information to citizens; Is not part of GI Polis - GI Polis is rather static and warns about upcoming events
		ATo16	Link communication app with media: have one way to inform them	Nice to have	CPA to have one channel to inform the media	CPAs, media	Functional	Communication channel to media	Have a dedicated channel/section to inform the media	CPA to have streamlined communication with the media

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TABLE 118: USER REQUIREMENTS FOR IBZ CASE STUDY

Case study	Context	Req.ID	Tools Requirements	Priority (Must, need, nice to have)	User scenario	Group	Type of Requirement	Function text	Requirement text	Rational text
IBZ	Implement and evaluate risk campaigns for children	ITo1	Risk assessment communication with citizens	Need	CPA can integrate risk assessment information and make it accessible to different user groups	CPA	Functional	Integration of risk assessment information	CPA can integrate risk assessment information	CPA to communicate risk assessment information
		ITo2	Sharing of material on information campaigns between CPAs (e.g. across Europe)	Need	CPAs to upload and comment information material	CPA	Functional	Repository on information campaign material	CPAs to upload material and "self-assess" the usefulness/impact	CPAs to share practices; facilitation of peer-learning
		ITo3	Risk assessment communication with citizens	Need	Citizens can access risk assessment information	Citizens	Functional	Risk assessment information can be accessed by citizens	Accessibility of risk assessment information	Citizens to access and understand risk assessments
		ITo4	Integration of online game for children	Need	Children to access online game and learn about different risks	Citizens	Functional	Online game	Online game on risk assessment to be used by children has to be integrated into solutions	Children to learn about different risks and risk reduction measures
		ITo5	Easy to use functionalities	Need	Children (age 6-12) to access and use the information	Citizens	Non-functional	Usability	Tool needs to be easy-to-use	User group are children aged 6-12

TABLE 119: USER REQUIREMENTS FOR EILAT CASE STUDY

Case study	Context	Req.ID	Tools Requirements	Priority (Must, need, nice to have)	User scenario	Group	Type of Requirement	Function text	Requirement text	Rational text
Eilat	**Application to enhance preparedness of volunteers (training, gamification, etc.)**	ETo01	Information about earthquake risk	Must	CPA to provide information about earthquake risk	CPA and citizens	Functional	Provision of training	CPA to include earthquake information in the application	Emphasize the need to act
		ETo02	Preparedness training	Must	CPA to include training material for preparedness	CPA	Functional	Application of training programs and education material for volunteers	Providing knowledge, experience, training and refreshment training	Enhance preparedness levels of volunteers and their families
		ETo03	Providing supporting steps/means that will help one to prepare	Must	CPA to include additional material facilitating the actual preparedness	CPA	Functional	Including additional instructions		
		ETo04	Application to connect volunteers and CPAs	Nice to have	CPA to send information material to volunteers	CPAs and volunteers	Functional	Information provision to volunteers	CPA to send information, reminders, trainings etc. to volunteers	CPA to send reminders, information videos and other information material
		ETo05	Gamified approaches for training about own preparedness	Need	Volunteers to access training material in a playful way	CPAs and volunteers	Functional	Gamified training	Gamified approached to training available via app	Enhancing the impact of trainings, turn information into action
		ETo06	VGI approaches for preparedness purposes (earthquake)	Need	Users to be involved in mapping activities for local	CPAs and volunteers	Functional	VGI local preparedness mapping	Training content to be translated into mapping exercises	To identify risks, hazards, safe places…

Case study	Context	Req.ID	Tools Requirements	Priority (Must, need, nice to have)	User scenario	Group	Type of Requirement	Function text	Requirement text	Rational text
					preparedness purposes					
		ETo07	VGI approaches for vulnerability mapping	Need	Users to contribute to vulnerability maps	CPAs and volunteers	Functional	VGI for vulnerability maps	Volunteers/citizens to be involved in vulnerability mapping	Better involve citizens in risk management
	Providing information about strategic response areas/items and safety status of citizens/volunteers	ETo08	Provide a map including strategic areas and places for earthquakes	Must	Citizens to access mapped information about earthquake response	CPAs and citizens	Functional	Response map with shelter information	User to access mapped information relevant for earthquake response	Users to easily find information about shelter and other relevant response items
		ETo09	Communication application that enables citizens to become aware whether their family is safe in case of an earthquake	Nice to have	Citizens to check whether their family is safe	CPAs and citizens	Functional	Allowing for inserting and accessing status updates of users	Citizens to insert and access updates on their safety status	Citizens to be informed about the safety status of their family members/friends
	Cognitive analysis of instructions	ETo10	Cognitive analysis: AI analysis is seen to be potentially helpful for analysing how people perceive instructions.	Must	CPA to analyse of instructions are perceived	CPAs and citizens	Functional	Analyse perception of trainings	CPA to analyse perception of training via application	Understand how/why trainings does (not) translate into action; The tool should assess knowledge and preparedness and to increase preparedness.

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TABLE 120: USER REQUIREMENTS FOR LANCASHIRE CASE STUDY

Case study	Context	Req.ID	Tools Requirements	Priority (Must, need, nice to have)	User scenario	Group	Type of Requirement	Function text	Requirement text	Rational text
LC	Two-way communication (using social media)	LCTo1	Use of social media to build resilience for vulnerable people	Need	CPA to send instructions to dedicated groups	CPAs and citizens	Functional	Information for vulnerable groups	CPA to send information to vulnerable groups	Increase citizen resilience
		LCTo2	Ability to contact volunteers during emergencies	Must	CPA to contact volunteers	CPAs and citizens	Functional	Reach out to volunteers	CPA to reach out to groups of (registered) volunteers	Enhance collaboration between CPAs and citizen volunteers that can be called on in a crisis
		LCTo3	Facilitate the use of social media in a multi-agency and multi-hazard setting	Need	Enhanced and concentrated use of social media by several CPAs	CPAs	Functional	Enhanced use of social media	More concerted use of social media in multi-agency settings	Streamline communication to citizens
		LCTo4	Organise and train volunteers	Need	CPA to" administer" volunteers	CPAs and volunteers	Functional	Administer volunteers	CPA to organise and train volunteers	CPA to better collaborate with volunteers
	Mapping approaches	LCTo5	VGI solutions to map vulnerable areas/vulnerable people in flood areas	Must	Citizens to contribute to vulnerability maps	CPAs and citizens	Functional	Vulnerability mapping	Involve citizens in vulnerability mapping	CPA to integrate more detailed information into vulnerability maps
		LCTo6	Communication of an affected area via the use of satellite maps	Must	CPA to communicate maps via app/social media	CPAs and citizens	Functional	Communication of maps (affected areas)	CPA to communicate maps	The aim is to enhance collaboration between CPAs and citizen volunteers that can be called on in a crisis
	Crowdsourcing of social media	LCTo7	Crowdsourcing social media for situation assessment	Need	CPA to use social media information for situation assessment	CPAs and citizens	Functional	Crowdsourcing of social media for situations assessment	Situation assessment based on social media information/data	CPA to develop a better and more detailed situation assessment including pictures from the ground

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TABLE 121: USER REQUIREMENTS FOR CAFO CASE STUDY

Case study	Context	Req.ID	Tools Requirements	Priority (Must, need, nice to have)	User scenario	Group	Type of Requirement	Function text	Requirement text	Rational text
CAFO	Communication tool facilitating two-way communication	CTo01	Warn citizens (just in time) about the leakage of hazardous substances and other emergency situations.	Must	CPA to warn citizens	CPA and citizens	Functional	Warning function	Solution to include the option to warn all or specific user groups	CPA to inform citizens about occurring events
		CTo03	Broadcast information via information boards by the roads, via TV, radio	Must	CPA to send warning to different channels	CPA and citizens	Functional	Warning to be sent to different channels	Warning should be displayed/received by different channels/users incl. Media, road signs etc.	CPA to widely disseminate the warning
		CTo04	Reverse emergency number for both registered and unregistered users	Nice to have	CPA to warn citizens	CPA and citizens	Functional	Warning to be sent to all possible affected people	Warning should be received for everyone in possible affected area	CPA to inform citizens about occurring events
		CTo05	Integrate the use of social media into the communication tool	Nice to have	CPA to send information to citizens but also to crowd-source social media	CPA and citizens	Functional	Better distribution of safety information and the possibility of using it for educating citizens online; access information provided by citizens	Two-way communication via social media	CPA to inform citizens about occurring events; CPA to extract information

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Case study	Context	Req.ID	Tools Requirements	Priority (Must, need, nice to have)	User scenario	Group	Type of Requirement	Function text	Requirement text	Rational text
		CTo06	Participant registry	Nice to have	Participants to register in the tool	Citizens	Functional	Participant registry	Participant should have to register for the tool	
		CTo07	Include information material and guidelines into the tools	Must	Citizens to access information material	Citizens, CPAs	Functional	Access to information and training material	Tool to include a section where information and training material can be made available	CPA to include additional material and guidelines including information on the use of the tool itself Section and material should be in local language
	VGI approaches | crowdsourcing from community with training and education purpose or side-effect	CTo08	Establishing joint VGI-based mapping approaches, enhancing two-way communication between citizens and CPAs	Nice to have	Citizens to contribute to local mapping approaches	Citizens, CPAs	Functional	Mapping contributions by citizens	Citizens to contribute to local mapping activities	Receive targeted (requested) information from the citizen but also "use" mapping for training purposes
		CTo09	Use of social media for situation assessment	Need	CPA to use social media information for situation assessment	Citizens, CPAs	Functional	Crowdsourcing of social media	CPA to crowd-source social media information	Obtaining in-time photos or short videos from the place of accidents (events) e.g. when flash floods occur; situational report with photos.

TABLE 122: USER REQUIREMENTS FOR PADOVA CASE STUDY

Case study	Context	Req.ID	Tools Requirements	Priority (Must, need, nice to have)	User scenario	Group	Type of Requirement	Function text	Requirement text	Rational text
Padova	Early-warning system with specific focus on climate-induced events	PTo1	Integration of vulnerable people, and rising awareness and to connect all relevant actors in an efficient way.	Must	Vulnerable people to register in the tool	Citizens	Functional	Vulnerable people registry	People need to register and indicate certain parameters for vulnerability (these are to be determined)	CPA wants to reach specifically dedicated vulnerable groups
		PTo2	Awareness raising	Must	CPA to include information material into the tool	CPA	Functional	CPA to include information	Material and specific information to be included into the tool	CPA wants to include information material and raise awareness
		PTo3	Sending instructions	Must	CPA to send instructions to users	CPA and citizens	Functional	Sending instructions	CPA to send instructions	CPA to inform citizen about action to be taken
		PTo4	Connecting all actors in an efficient way	Must	Connecting three types of actors: 1. data owners 2. Operation centre and CPAs 3. citizens	CPA and citizens	Functional	Connecting different actors	Tool to connect different actors with different roles in the warning/information process	1. Smooth data management 2. Effective communication 3. All actors on the same page 4. prepare vulnerable people to adopt certain behaviours
		PTo5	Warn everywhere within the municipality	Must	CPA to send warnings to everyone	CPA and citizens	Functional	Warning to all	CPA to be able to send warnings to all citizens in the municipality	Reaching out to everyone in case of a major emergency
		PTo6	Warn very specific (isolated) areas and vulnerable people that are difficult to reach	Must	CPA to send warnings/instructions to specific groups/areas	CPA and citizens	Functional	Targeted messaging	Sending information to specific groups/areas	CPA to reach very specific vulnerable groups

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Case study	Context	Req.ID	Tools Requirements	Priority (Must, need, nice to have)	User scenario	Group	Type of Requirement	Function text	Requirement text	Rational text
		PTo7	Related to a network of distributed sensors in the region: These sensors should give data on the timing, climatic conditions in the area, and geographical position of a possible hazard/threat/problem in the region.	Nice to have	CPA to collect distributed data	CPA	Functional	Distributed data collection	CPA to collect data in a distributed way	CPA to have higher resolution data about hazards; the aim is to evaluate the comfort of public spaces in case of heat waves or the impacts of other climatic events
	Communication tool facilitating two-way communication	PTo8	Exchange information in real time and reach vulnerable groups	Must	CPA to exchange information with vulnerable groups	CPA and citizens	Functional	Two-way communication between CPA and citizens	Two-way communication to be facilitated via tool	CPA and citizens to communicate with each other
		PTo9	Connect persons to other actors	Need	Connect CPAs, citizens and other stakeholders	CPA and citizens	Functional	Connecting different actors	Facilitate communication between different stakeholders	Enhance information exchange
		PTo10	Communication via app	Need	Above functionalities to be implemented via app	CPA and citizens	Non-functional	App development	Functionalities to be implemented via app	

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TABLE 123: USER REQUIREMENTS FOR ISAR CASE STUDY

Case study	Context	Req.ID	Tools Requirements	Priority (Must, need, nice to have)	User scenario	Group	Type of Requirement	Function text	Requirement text	Rational text
ISAR	**Application of a contact tracking app in a pandemic situation** **The overall aim here is the enhancement of existing applications** **Note: the case study aims to develop recommendations on the use and further development of such apps; the requirements will complement this activity; no development effort is foreseen within RiskPACC**	ITO1	Enable different functionalities	Must	User opens app and can select different functionalities	Citizens	Functional	Select functionalities	User should be able to select different functionalities	The application should go beyond the "pure" tracking but include several functionalities
		ITO2	Menu to navigate different functionalities	Must	User can navigate the functionalities	Citizens	Functional	Develop a menu / navigation	User should be able to navigate to different sections (and further sub-sections)	User needs to be able to navigate and select different video contents
		ITO3	Play informative videos	Must	User selects "training and information" and play videos	Citizens	Functional	Develop "training and information" section; Play videos	User should be able to navigate to "information and training" section (and further sub-sections); User will select informative video of interest	User needs to be able to watch videos
		ITO4a	Integrate gaming	Nice to have	User has access to games and	Citizens	Functional	Include games / quizzes into "training and information" section	User should be able to play informative games and quizzes via app	User will learn about the Pandemic/ behaviours in responding to it
		ITO4b	Integrate nudging approaches	Nice to have	User has access to other information (nudging related)	Citizens	Functional	Include nudging aspects/information in app	Citizens to receive information/suggestions e.g. for getting vaccinated	Integrate nudging as an approach to "soft push" citizens towards desired behaviour
		ITO5	Incorporate pictograms	Must	Citizens to receive information via pictograms	Citizens	Functional	Include pictograms in app	Pictograms to inform about the Pandemic and response behaviour	Access barriers to information should be reduced; pictograms should bridge language and literacy barriers

		ITO6	Allow for writing and receiving of messages	Need	Messaging between CPA and citizens; e.g. direct contact to health authorities in case of positive testing	Citizens	Functional	CPAs and citizens to be able to communicate directly via app	establish direct lines of contact	Service should enhance the communication between CPAs and citizens

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TABLE 124: PLATFORM REQUIREMENTS

Platform part	Req. ID	Platform requirement	User Scenario	Group	Type of Requirement	Function text	Requirement text	Rational text	Priority for case study (Must, need, nice to have)						
									Attica	IBZ	Eilat	LC	CAFO	Padova	ISAR
Static part															
Introduction | Information about RPAG	Info 01	General information section about the RPAG	User enters platform and receives general information about the RPAG;	Citizen and CPA	Functional	General information section for platform	Platform should encompass a general information section about the RPAG; can also be potential entry for navigation	Inform user about what the RPAG is about, what is the aim of the platform			Need	Nice to have		x	
Framework and Guidelines	FW G01	Framework overview	User to understand the conceptual background of the RPAG and the steps he/she can take to close it	Citizens and CPAs	Functional	Framework information	Platform to depict the framework and link it with additional material such as examples and the repository	User to understand the framework and to retrieve material to explain its application			Need	Nice to have		x	
	FW G02	Instructions linked with framework	User to receive suggestions and instructions on closing the "own" RPAG	Mainly CPAs	Functional	Instructions linked with framework	Platform to include a section linking the framework (FWG01) with the repository	Theoretical framework sections should translate into concrete recommendations and good practice collected in the repository			Must	Need		x	
Repository	RP01	Repository of good practice to close the RPAG	User to receive information about good practice under different sections of the framework	Citizens and CPAs	Functional	Repository of good practice (closing the RPAG)	Content to be added by users;	User to share material and learn from			Must	Nice to have		Must	

	RP02	Repository on training material	User to find (updated) training material in the repository	Citizens and CPAs	Functional	Repository of good practice (Trainin	content retrievable by user	others on closing the RPAG			Must	Must		Must	

Platform part	Req. ID	Platform requirement	User Scenario	Group	Type of Requirement	Function text	Requirement text	Rational text	Priority for case study (Must, need, nice to have)						
									Attica	IBZ	Eilat	LC	CAFO	Padova	ISAR
						g Material)									
	RP03a	Recommendations on the use of Pandemic tracking apps (input)	User to be able to insert recommendation	Citizens and CPAs	Functional	Repository of good practice (Tracking Apps Input)	Input template for the collection of recommendations	Users to contribute to recommendations			Nice to have	Nice to have		Nice to have	x
	RP03b	Recommendations on the use of Pandemic tracking apps (output)	User to be able to find and filter recommendation	Citizens and CPAs	Functional	Repository of good practice (Tracking Apps Output)	Recommendations to be available to users	Users to use recommendations			Nice to have			Nice to have	x
	RP04	Examples of (successful) public campaigns concerning risks & risks education	User to be able to find and filter successful campaigns	CPAs	Functional	Repository of good practice (Campaigns)				x	Need			Must	
Training Material	TM01	Availability of training material on the application of the framework	User to find information and training material on the RiskPACC framework	Citizens and CPAs	Functional	Training material for framework	Training material to be available via platform	User to learn about the use of the RiskPACC framework			Nice to have	Need		Must	
	TM02	Availability of training material on RiskPACC tools	User to find information and training material on the tools developed by RiskPACC in a dedicated area	Citizens and CPAs	Functional	Training material for tools	Training material to be available via platform	User to learn about the functionalities and use of the tools		Must	Need	Need	Must	Must	Mandatory
	TM03	Availability of training material for volunteers	User to find information and training material for volunteers	Citizens and CPAs	Functional	Training material for volunteers	Training material to be available via platform	User to learn about the involvement of volunteers	x		Must	Must		Must	

Platform part	Req. ID	Platform requirement	User Scenario	Group	Type of Requirement	Function text	Requirement text	Rational text	Priority for case study (Must, need, nice to have)						
									Attica	IBZ	Eilat	LC	CAFO	Padova	ISAR
	TM04	Availability of training material for children	User to find information and training material for children	Citizens and CPAs	Functional	Training material for children	Training material to be available via platform	Specific material for children		x	Nice to have	Nice to have		Need	
Working Space	WS01	Setting-up an account	User to create an account	Citizens and CPAs	Functional	Account creation	User to create an account	Creation of a working space/personal area; rights management			Nice to have	Nice to have		Must	
	WS02	Framework processing (integrating own data/information to derive an understanding of the RPAG in the "own" context (assessment)	RPAG assessment by user	CPAs and citizens	Functional	RPAG Assessment	User to conduct an RPAG assessment	User to identify RPAG by the means of the platform			Nice to have	Need		Need	
	WS03	Framework processing (developing "own" solutions/approaches based on repository examples (RP01) and guidelines (FWG02)	User to develop measures to close the RPAG	CPA and citizens	Functional	Closing RPAG	User to develop an own portfolio for closing the RPAG	Making use of the repository and self-assessment to develop own strategies			Nice to have	Must		Need	
	WS04	Evaluation guidance and implementing tool(s) to evaluate risk campaigns and their impact	User to implement an evaluation of risk campaigns	CPAs	Functional	Evaluation of risk campaigns	Provide guidance and facilitate implementations of a risk assessment campaign	Facilitate CPAs to implement the evaluation of risk campaigns and their impact		x	Need	Nice to have		Need	

	WS05	Different profiles according to	Rights management	CPAs	Functional	User and access rights	CPA to define different types of users and link with	Overall access and rights management						x	

Platform part	Req. ID	Platform requirement	User Scenario	Group	Type of Requirement	Function text	Requirement text	Rational text	Priority for case study (Must, need, nice to have)						
									Attica	IBZ	Eilat	LC	CAFO	Padova	ISAR
		the type of actor					access and user rights								
	WS06	Registration to the platform should be open for citizens /vulnerable people and limited for the other actors	CPA prioritising users	CPA and citizens	Functional	User prioritisation	CPA to define core/preferred users	Prioritise "clients" which are to be targeted via the platform						x	
Dynamic part															
Crowdsourcing for environmental assessment	CSEVA01	Document (imminent) hazards or occurred events through posts & photos	Users to upload information (posts) and photos into platform	Citizens	Functional	Uploading of text and photo material	User should be able to upload text information and photos	User should be able to communicate hazard related information to CPA via platform	Nice to have	Nice to have	Nice to have	Need	Nice to have	Need	Nice to have
Crowdsourcing from community	CSCM01	Share posts with the community groups	User to share posts with his peer group	Citizens	Functional	Sharing of posts	Sharing of posts with peers	User should be able to pass on information to peers with similar characteristics such as age, medical diseases, geo-location	Nice to have	Nice to have	Nice to have	Must	Need	Must	Nice to have
	CSCM02a	Sharing of information between CPAs and citizens	User to communicate with CPAs	Citizen	Functional	Messaging	Sharing of information of citizen with CPA	User should be able to pass on information to CPA	Nice to have	Nice to have	Nice to have	Must	Nice to have	Must	Need

	CSC M02 b	Sharing of information between CPAs and citizens	CPA to communicate with citizen	CPA	Functional	Messaging	Sharing of information of CPA with citizen	CPA should be able to pass on information to citizens	Nice to have	Nice to have	Nice to have	Must	Nice to have	Nice to have	Need

Platform part	Req. ID	Platform requirement	User Scenario	Group	Type of Requirement	Function text	Requirement text	Rational text	Priority for case study (Must, need, nice to have)						
									Attica	IBZ	Eilat	LC	CAFO	Padova	ISAR
	CSCM03	Approval of hazard reported by citizens	CPA to approve hazard or information received from citizen	CPA	Functional	Messaging, public posts or warnings	CPA knees to approve (or disapprove) a hazard	CPA to react to reports by citizens	Must	Nice to have	Nice to have	Need	Must	Must	Must
	CSCM04	Warning services by CPA	CPA to send a warning	CPA	Functional	Public posts or warnings	CPA to send out an alert/warning	CPA to communicate hazards/threats (and potentially related instructions)	Nice to have	Nice to have	Nice to have	Need	Need	Must	Need

TABLE 125: GENERAL NON-FUNCTIONAL REQUIREMENTS

Requirement	Req.ID	Requirement specification	User Scenario	Group	Type of Requirement	Function text	Requirement text	Rational text	Priority for case study (Must, need, nice to have)						
									MRP	IBZ	Eilat	LC	CAFO	CPD	ISAR
Overall	NFO	Platform should facilitate communication between CPAs and citizens	Bi-directional communication between citizens and CPAs	CPAs and citizens	Non-functional	Facilitate bi-directional communication	Underlying processes and responsibilities & (access) rights need to be clear	Solution will only enable agreed processes and information sharing procedures	Must		Nice to have	Must			
Language	NFL	Multilingual platform	User should be able to select different languages (and use in local language)	Citizens and CPAs	Non-functional	User to select language	Different languages need to be provided	Broaden the accessibility; reduce language barrier	Nice to have	Must		Nice to have	Must		Need
Usability	NFU01	User-friendliness	User to use solutions intuitively and without a lot of explanation	Citizens and CPAs	Non-functional	Easy to use solutions	Tools can be easily used	Reduce barriers to application							Need
	NFU02	Barrier-free	Solutions also to be used by impaired people, people with low technological literacy (elderly, etc.)	CPAs and citizens	Non-functional	Barrier-reduction	Apply pictograms, local language, scalability of font size etc. wherever possible	Reduce barriers to application and develop inclusive technology			Need	Need			Need

	NF U03	Limitation of functionalities	User to select from a limited number of	CPAs and citizens	Non-functional	Limits number of services	Solutions should not be too encompassing but focus on some and easy	Keep it simple								Need

Requirement	Req.ID	Requirement specification	User Scenario	Group	Type of Requirement	Function text	Requirement text	Rational text	Priority for case study (Must, need, nice to have)						
									MRP	IBZ	Eilat	LC	CAFO	CPD	ISAR
			functionalities				to understand functionalities/services								
Technical	NFT 01	Storing of data in local servers	Platform data should be saved in local servers	CPAs	Non-functional	Local saving of data	Data needs to be stored locally	Data control and back-up required by CPA	Must			Nice to have		Need	
	NFT 02	Data validation and control	User needs to control and validate information uploaded by citizens	CPAs	Non-functional	Data control and validation	CPA needs to control and validate the data/information uploaded to the platform by citizens		Must		Need	Nice to have		Need	
	NFT 03	Platform compatible with Android (potentially also with other operating systems)	Several devices to be interoperable with platform	Citizens and CPAs	Non-functional	Interoperability of devices	platform needs to be compatible with Android and potentially with other operating systems	interoperability with several devices	Need		Must	Must		Must	
	NFT 04	Interconnection with national local services to integrate additional information and data	Already available services should be able to be integrated into the platform	CPAs	Non-functional	Integration of existing services	Integration of additional data, warnings etc. should be possible	Allow for integration with existing services such as National Meteorological Service, so as to report on the development and the speed of an event and maybe the direction it's heading and the wind speed	Nice to have		Nice to have			Must	

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	NFT 05	App based solutions so they can be	User to access tools/service	CPAs and	Non-functional	App-based services	Solutions should be accessible via mobile phone (app)	Access from anywhere				Need	Need		

Requirement	Req .ID	Requirement specification	User Scenario	Group	Type of Requirement	Function text	Requirement text	Rational text	Priority for case study (Must, need, nice to have)						
									MRP	IBZ	Eilat	LC	CAFO	CPD	ISAR
		used on phones	s via mobile phone	citizens											
	NFT 06	Web-based solution	Providers to update and monitor solution	CPAs and citizens	Non-functional	Web-based maintenance of solutions	Providers to update/curate solutions online	allow for easy updates and collection of feedback							
Ethical and Legal	NF ELP 01	Equal and non-discriminatory access to technology	Barrier-free and easy access	CPAs and citizens	Non-functional	Non-discrimination	Using well-designed user interfaces, instructions and authentication.	Ensure equal and non-discriminatory access to technology and its support services by							
	NF ELP 02	Right of access	User to get access to his/her data	CPAs and citizens	Non-functional	Right of access	Provide a self-service portal where the data subject can get access to his/her data.	Right of access							
	NF ELP 03	Right to be forgotten	User to delete personal data	CPAs and citizens	Non-functional	Right to be forgotten	Build capabilities for deleting personal data.	Data subject rights							
	NF ELP 04	Deploy the functionalities related to cybersecurity	Services and data protected	CPAs and citizens	Non-functional	Cyber protection	Deploy the functionalities related to cybersecurity	Protection of services and data							
	NF ELP 05	Consent	User to provide consent for use of personal data	CPAs and citizens	Non-functional	Consent	Capabilities for asking consent as part of the service and that the consent is documented properly (obligatory)	Ethical and legal principles							

Requirement	Req.ID	Requirement specification	User Scenario	Group	Type of Requirement	Function text	Requirement text	Rational text	Priority for case study (Must, need, nice to have)						
									MRP	IBZ	Eilat	LC	CAFO	CPD	ISAR
	NF ELP 06	Data minimisation	Erase or anonymise data	CPAs and citizens	Non-functional	Data minimisation	Technical capabilities to erase or anonymise personal data after the relevant data retention period. Ensure that data will be removed from all systems. Define automated functions if this is possible.	Data protection; Storage minimisation							
	NF ELP 07	Data accuracy	Retrieve sources of data	CPAs and citizens	Non-functional	Data accuracy	Ensure that the source of the data is recorded.	Data accuracy							

The RiskPACC Consortium

FIGURE 1: THE RISKPACC CONSORTIUM