RiskPACC

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

QUALITY, RISK AND INNOVATION MANAGEMENT STRATEGY

Deliverable D9.2

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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 seven (7) case studies, to jointly design and prototype novel solutions.

The “RiskPack” 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

Quality assurance, risk management and innovation management are crucial elements that determine the success of a project. The report at hand details RiskPACC's approach to these elements.

The general quality management in RiskPACC builds on responsibilities and regulations as outlined in the Grant Agreement as well as the Consortium Agreement. This includes the roles of the Project Coordinator, the WP Leaders, Task leaders, General Assembly, Advisory Board, Ethics Advisory Board, and Associated Partners, as well as the Technical Manager and Case Study Manager. Regular meetings conducted at different levels, and dedicated communication platforms support ensuring proper knowledge transfer and thereby the quality of work. Technical Management and Integration Assurance will be achieved through close collaboration with relevant WP Leaders and particularly WP5 (Tool development) and WP7 (System architecture and technical integration). The internal review process of project deliverables with dedicated roles and deadlines ensures a high level of quality in the achievements of RiskPACC.

The risk management approch of RiskPACC covers the following phases of risk management: risk identification, risk assessment, mitigation plan, and risk monitoring. An initial list of risks and mitigation measures, based on those identified in the proposal phase, will be used to monitor specific risks, opting to minimise negative impacts.

The innovation management strategy of RiskPACC considers both technology push and market pull aspects, which is in line with newer innovation models. As there will be more than one innovation within RiskPACC, it is also of importance to disseminate the current status of the innovations within the consortium. Thus, bi-annual reviews of the project activities and outputs including their innovation potential are conducted. Towards the end of the project a roadmap for further development and implementation of the RiskPACC solution will be developed.

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GLOSSARY AND ACRONYMS

Term	Definition
CPA	Civil Protection Authority
DoA	Description of Action
DR	Development Risks
EC	European Commission
ER	External Risks
EU	European Union
GA	General Assembly
IR	Impact Risks
MR	Management Risks
RPAG	Risk Perception Action Gap
PC	Project Coordinator
SotA	State of the Art
TC	Task Leader
WP	Work Package
WPL	Work Package Leader

TABLE 1: GLOSSARY AND ACRONYMS

1. INTRODUCTION

1.1 Overview

According to the DoA, this report lines out the procedure for quality, risk and innovation management within RiskPACC. The main objective of this document is to explain the approach to quality assurance in RiskPACC in general, and the internal review process in specific, to identify and address risks, and to maximize exploitation of innovation opportunities.

Since all RiskPACC partners are involved in and contribute to the quality of project achievements, to minimise risk, and to optimize innovation management, all partners are encouraged to carefully read the document. It can also be used as information source for specific questions such as how to conduct an internal review.

1.2 Structure of the deliverable

This document includes the following chapters – one on quality assurance, one on risk management, and one on innovation management:

- In chapter 2, the quality assurance within RiskPACC is described, including the general quality management, the technical management and integration assurance, as well as the internal review approach.
- In chapter 3, the risk management adopted in the project is explained. It includes a general description of risks, phases of risk management as well as an initial list of identified risks and mitigation measures.
- Finally, in chapter 4, the approach to innovation management in RiskPACC is described.

2. QUALITY ASSURANCE

2.1 General Quality Management

2.1.1 ROLES AND RESPONSIBILITIES

The general quality management is based on RiskPACC's governance structure as defined in the project's Consortium Agreement (chapter 6), and in the Grant Agreement (e.g. section 3.2.1). Here, amongst others the main roles and responsibilities are defined, to ensure quality of work and its monitoring. This includes the roles and responsibilities of the Project Coordinator (PC), the WP Leaders (WPL), Task leaders, General Assembly, Advisory Board, Ethics Advisory Board, and Associated Partners. The Grant Agreement (section 3.2.1) further explains the

supporting role to the Project Coordinator (FhG) in managing RiskPACC by a technical manager (ICCS) and a Case Study Manager (USTUTT). In addition to these roles as defined in the Consortium Agreement and Grant Agreement, for each case study a dedicated scientific partner has been assigned, in order to ensure scientific based alignment among the case studies. The case study scientific partners are KEMEA, UoW, STAM, Efus, FhG, TRI and UCL.

2.1.2 REGULAR MEETINGS

In order to keep all partners on track, to ensure knowledge exchange, to collect contributions and organize in- and outputs, regular meetings (physical and/or online) on different levels are crucial.

The Project Coordinator organizes plenary meetings, at least 2-3 times in a year, and WPL meetings once in a month. The WPL, responsible for coordinating contributions to their WP, shall organize regular WP meetings, at least once a month during the WPs lifetime. Task leaders, responsible for coordinating contributions to their task, shall organize regular meetings during the WPs lifetime, according to the specific needs of the task.

Additional regular and nonregular meetings shall be organized according to specific needs.

2.1.3 FILE STORAGE AND COLLABORATION PLATFORM

To support effective collaboration, two main platforms are used to share files and collaborate: Microsoft Teams and the Fraunhofer ownCloud.

Microsoft Teams is a communication platform developed by Microsoft as part of the Microsoft 365 family of products. It is mainly used for online meetings, and to store working documents, enabling simultaneous working on files. Working spaces (“Teams channels”) have been set up for each WP.

Files that are used for reference, or that do not require further collaborative work, will be stored in the Fraunhofer ownCloud. The developers of ownCloud define ownCloud as “an open-source file sync and share software for everyone from individuals operating the free ownCloud Server edition, to large enterprises and service providers operating the ownCloud Enterprise Subscription. ownCloud provides a safe, secure, and compliant file synchronization and sharing solution on servers that you control” (The ownCloud Team 2020).

2.1.4 TEMPLATES

Templates serve corporate identity and also help to ensure consistency and that common aspects are addressed, including specific chapters in a report template. Common templates have been developed for

- Deliverables (within task 8.1),
- PPTX presentations (within task 8.1), and
- Internal review report (see Annex).

For meeting minutes, it is not obligatory to use a specific template. However, minutes should include the main outcomes of the meeting, tasks with dedicated responsibilities and respective deadlines. Minutes have to be circulated without undue delay.

Templates will be stored in dedicated folders in the Fraunhofer OwnCloud.

2.2 Technical Management and Integration Assurance

Technical Management will be achieved through close collaboration with relevant WP Leaders and particularly WP5 (Tool development) and WP7 (System architecture and technical integration). The Technical Management team will provide support during the development and implementation of the RiskPACC technical aspects in order to ensure the compliance with technical milestones, intermediate outputs and eventually project technical objectives. RiskPACC is a challenging project from a technical perspective which aims at incorporating several technological tools into a platform to assist the bi-directional communication between various stakeholders; thus, the technical management will facilitate the integration of the different tools towards accomplishing the project goals. As it is usual, the initial concept of a research project is further developed and adjusted over time, as the user requirements are clarified and the system is designed and implemented. RiskPACC, as a research project, requires a flexible technical management approach to handle changing requirements and to adjust technical concepts if necessary. Technical and integration meetings will therefore be organized at regular time intervals in order to assess the progress with respect to technical results and to ensure that pending technical issues will be solved on time.

2.3 Internal Review Approach

2.3.1 OBJECTIVES OF INTERNAL REVIEW

In order to assure quality of achievements including reports, the toolset, framework and guidelines, an internal review process of deliverable drafts will be followed. The review process aims to improve the quality of work, and also strengthens collaboration within the project by involving partners (the reviewers) in the work who have not participated in the work, and who will receive a better understanding, and possibly align the work towards their needs in following tasks.

2.3.2 MAIN ROLES IN INTERNAL REVIEW

The main roles within an internal review process are the main author, WP Leader, Project Coordinator and – of course – the reviewers.

Main author: The main author of a deliverable (defined in the DoA) is responsible for the preparation of the deliverable. He/she organizes contributions from partners/co-authors, collects their input and prepares the draft for internal review. Based on the review results and possibly additional feedback (e.g. from WP Leader and/or Project Coordinator), the main author prepares a final version of the deliverable. This includes collected corrective measures from contributing partners.

WP Leader (WPL): The WPL has the overall responsibility of the results of the respective WP. The WPL may provide feedback to the draft deliverables in addition to the assigned reviewers. In case the draft requires major review or is not acceptable according to the reviewers, the WPL monitors the corrective measures and revision of the deliverable.

Project Coordinator (PC): The PC sets up and monitors the review process. The PC assigns reviewers to deliverables in agreement with the partners (see below, under "Reviewers"). The PC may provide feedback to the draft deliverables in addition to the assigned reviewers and the WPL. The PC approves or rejects the final version of the deliverable. If approved, the PC submits the deliverable, i.e., uploads the document in the portal of the European Commission (EC). A copy of the submitted version will be stored in ownCloud.

Reviewers: The reviewers read the draft deliverable and prepare a review report, using the template (see Annex). In addition, they may provide comments within the draft deliverable document. At the end of their report, the reviewers define if the draft is accepted as is, needs minor or major revision, or is not acceptable. In case the draft is not acceptable or requires major revision, the reviewers will check the document again after revision by the authors and decide if the revised version is accepted or requires another revision. A table with the reviewers (reviewing organisations and specific person) per deliverable will be stored in the WP9 Teams channel. The assignment of reviewers will consider "recipients" of the deliverables' outputs within RiskPACC, technical skills, as well as the overall budget share of organisations (since there is no dedicated budget for conducting reviews). Preferably, the reviewing organisation did not participate in the development of the deliverable. If it did, the reviewer (person) will be someone who was not involved in the development process.

2.3.3 INTERNAL REVIEW PROCESS

The main steps for the internal review process are as follows (see Figure 1):

Step 1: The main author sends the draft deliverable to the reviewers, keeping WPL and PC in the loop, until 28 days before deadline (end of the month).

Step 2: The reviewers provide their review reports (using the template, see Annex) to the main author, keeping WPL and PC in the loop, until 21 days before deadline.

Step 3: In case another check by the reviewers is required, the main author revises the draft by implementing the reviewers' comments until 14 days before deadline.

Step 3a: In case another check by the reviewers is required, the reviewers decide about acceptance or not acceptance of the revised version until 10 days before deadline.

Step 3b: In case only minor changes are required, the main author revises the draft accordingly, and proceeds with Step 4.

Step 4: The main author sends the final draft to the PC until 7 before deadline.

Step 5: The PC approves (or rejects) the deliverable and submits the deliverable to the EC (if approved).

In case at least one of the reviewers sees a need of major revision, or finds the draft not acceptable, WPL and PC will be informed. If needed, corrective actions in addition to the reviewer‘s comments will be agreed on.

After revision, if at least one of the reviewers does not accept the revised version, corrective actions, involving the General Assembly, will be agreed on.

In case the PC rejects the final version, corrective measures will be defined involving the main author, WPL and PC. If no solution can be found, the General Assembly will be involved. If the deliverable’s submission deadline cannot be met, the EC will be informed.

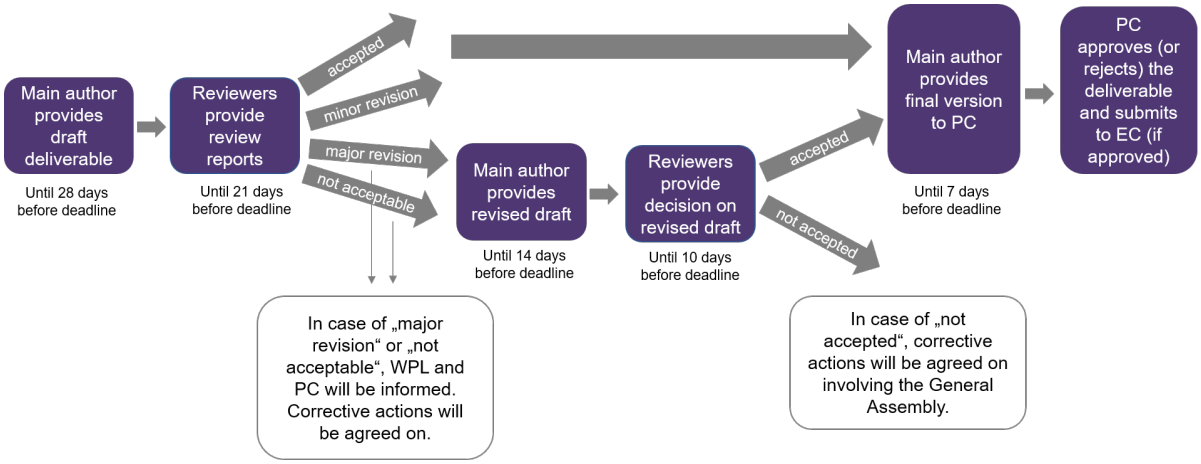

FIGURE 1: RISKPACC INTERNAL REVIEW PROCESS

Figure 1 presents an overview of this review process.

The deadlines as explained above need to be shortened for the first deliverables in the project, i.e. those in 2021. This will be conducted in agreement with all actors involved (main authors, reviewers, PC).

For future deliverables, an early involvement of all actors is strongly recommended as well. Adapted deadlines can be agreed if necessary. In addition, an early involvement should avoid that reviewers are not available during the time foreseen for the review.

For writing the deliverable, it is recommended to authors to check the criteria as used in the review template. This way, early consideration of relevant quality aspects can be assured.

All main documents of a review process will be stored in a dedicated folder in the Fraunhofer ownCloud: The template for the review report (see Annex), the draft and final versions of the deliverable, the submitted version of the deliverable and the review reports.

3. RISK MANAGEMENT

3.1 What are the risks?

All project activities carry some element of risk, which are uncertainties that could affect the project in a negative way (George 2020). Risks are defined as unexpected events or conditions that might have negative effects on project objectives (Eldash 2012). Therefore, Risk Analysis and Management is a key project management practice to ensure that the least number of negative surprises occur while the project is underway (Lavanya and Malarvizhi 2008). The coordinator will ensure that risks are actively identified, analysed, and managed throughout the life of the project. Risks will be identified as early as possible in the project so as to minimize their impact.

3.2 Phases of Risk Management

The purpose of project risk management is to minimize the risks of not achieving the objectives of the project (Eldash 2012). RiskPACC will follow the phases of risk management represented in Figure 2:

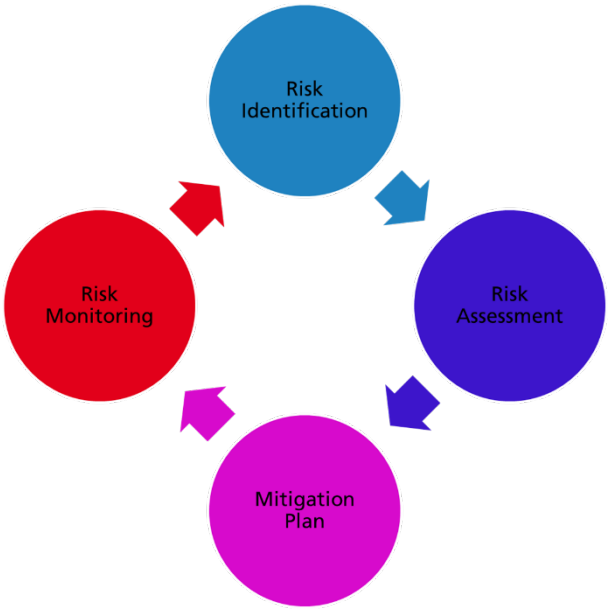

FIGURE 2: PHASES OF RISK MANAGEMENT

3.2.1 RISK IDENTIFICATION

Each partner in the project is responsible for reporting potential risks (and proposing mitigation actions) by informing their task leader, work package leader and ultimately the project coordinator.

The risks will be identified continuously, reported, and monitored on an ongoing basis, and included in the General Assembly quarterly conference calls. Each WP leader will maintain a WP Risk Log and report it to the coordination team and other WP leaders. Cross-WP risks will be handled by all relevant WP leaders together.

3.2.2 ASSESSMENT

The Work Package Leader (WPL) and the project coordinator have the responsibility to assess the risk impact, probability of occurrence and mitigation actions. All risks that can be managed at this level should be addressed as soon as possible. Major risks will be reported to the EC.

Risk can be defined as the combination of the probability of an event and its consequences. Table 2 and Table 3 present a categorization of probability and impact, which lead to the risk levels as presented in Figure 3:

Risk	Probability of occurrence	Points
Low (L)	Less than 20%	1
Medium (M)	20-50%	2
High (H)	50-100%	3

TABLE 2: RISK'S PROBABILITY

Impact	Point
Mild impact (L)	1
Sizable impact (M)	2
High impact (H)	3

TABLE 3: RISK'S IMPACT

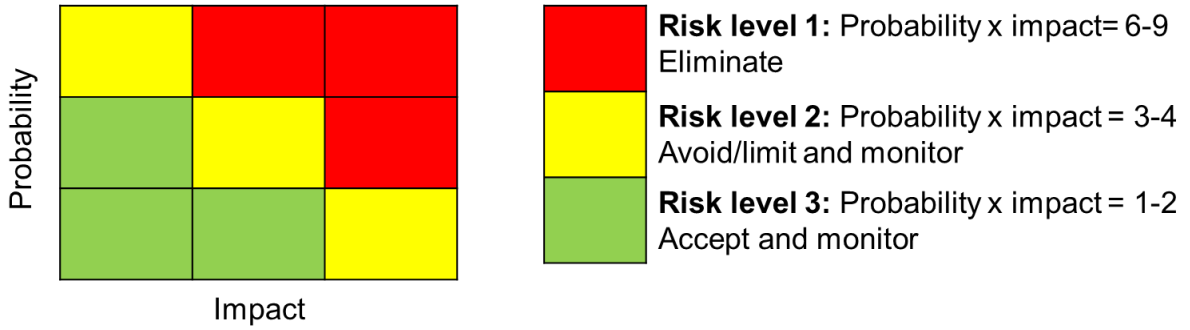

FIGURE 3: RISK'S LEVEL (GEORGE 2020; ELDASH 2012; STEEN AND TUAN LE 2018)

The probability and impact of a risk will be assessed by the work package leader and the coordinator using the "risk point-system" and a risk-matrix (Steen and Tuan Le 2018).

3.2.3 MITIGATION

Risks that fall within the red or yellow zones will be discussed in the General Assembly quarterly meetings. For these risks a mitigation plan will be developed by the affected work package leader in collaboration with the coordinator.

3.2.4 MONITOR

The risks of the RiskPACC project will be tracked, monitored and reported throughout the project life-time. For this a risk management register (an Excel sheet) is created and maintained by the coordinator. All risks, their probability, impact and if necessary mitigation plans are described in this register. Before each General Assembly quarterly meeting this risk management register is updated and if necessary new mitigation measures are discussed during the General Assembly meeting. After this, the decisions regarding new risks and/or mitigation plans are documented in the risk management register.

3.3 Initial List of Risks

RiskPACC has identified critical risks specific to the project. There are other risks, associated more generally with projects of this nature, and particularly collaborative ones, such as incorrect assumptions, the delay of critical tasks, staff turnover, defaulting partners, and the failure of the consortium to act openly and collaboratively.

Table 4 distinguishes between management risks (MR), development risks (DR), and impact risks (IR) and external risks (ER).

ID	Description of risk	Proba-bility	Im-pact	Mitigation Measures
MR1	Withdrawal of a key partner from the consortium.	L	H	The coordinator will ensure quality assurance, reporting procedures and communication culture within the consortium to allow the early identification of issues. As the consortium is resourceful enough to reorganise and redistribute most responsibilities, the impact on project outputs of a partner leaving the consortium, or being relieved, will be low. If the loss of a partner cannot be compensated from within the consortium, the consortium can tap into its extensive network and is likely to find an external replacement organisation at short notice.
MR2	Partners are lacking skills to tackle the complexity of the project	L	H	The project partners are all highly experienced in collaborating on EC funded projects and the project's domain, and they are accustomed to work within the complex nature of the domain of risk perception, risk awareness, and crisis management. Should a partner display lack of skill, the PC will consult the General Assembly and take appropriate action, e.g. by effort redistribution. Quality management procedures will be put in place to detect such issues early.
MR3	Disruption of communication and collaboration between partners.	M	M	The issues addressed in RiskPACC can be tackled from a variety of angles, as can be seen by the heterogeneity of approaches to closing the RPAG as well as the range of scientific scholars and end-user actors including citizens involved. Project partners are aware of this. An open and constructive collaboration culture within the project is therefore essential to identify differences in views at an early stage. Much thought has been given to ensure the kick-off meeting fosters a multidisciplinary understanding of the topics and provides consortium members with a chance to align their views and create a common nominator for the project. WP leaders are experienced project managers, who will stimulate convergence in vision among consortium partners throughout the project duration.
MR4	The complexity of the project requires more effort than is allocated to the project.	L	M	The EU call to which RiskPACC responds is demanding and ambitious in nature. The stated plan will yield satisfactory results and will answer to the demands defined in the call. The project proposal is pragmatic and incremental in nature, allowing for swift reconfiguration and scalability. It is based on careful calculation regarding the balance between available resources, partner capacities, project duration and ambition. Milestones serve as checkpoints to assess progress.
MR5	WPs need more time than envisaged and deliverables also needed as input for other tasks are delayed	M	M	Due to the frequent plenary meetings (2-3 per year) and monthly WP telephone conferences, annual face-to-face project meetings and close collaboration between the coordinator and the WP leads, potential delays will be identified as early as possible to identify concrete mitigation measures. They can encompass extensions, support from other partners, or the adaptation of the work plan or deliverables if absolutely necessary.

MR6	Ethics and security concerns slow or stop the project	L	M	WP9 will monitor and proactively address ethical and privacy related issues. It will be guiding the consortium to implement data privacy and security procedures, e.g., by supporting the partners in generating user consent forms, which will also be cleared by the Ethics Manager and the Ethics Advisory Board. All ethical concerns that might arise through the involvement of vulnerable groups will be flagged at the beginning of the project and during biannual revisions.
MR7	Case studies are not able to contribute to the project effectively.	L	M	RiskPACC has involved a broad range of case studies to reduce this risk. In addition, all case studies will receive guidance on all managerial aspects including financial reporting and the implementation of co-creation labs. Guidance and training material in local languages will be available to facilitate the implementation of the co-creation sessions.
DR1	Case study needs do not match the envisaged advancement beyond the SotA	M	H	RiskPACC has involved a broad range of case studies to reduce this risk. In addition, the solutions are flexible in nature and adaptable to the particular requirements (see also section 1.3.2.2.2 of the Grant Agreement). Finally, RiskPACC envisages to fully exploit the gamification approach and will thus offer gamified solutions and training to needs that might not require for technical solutions in the first place.
DR2	Technical solutions cannot be integrated	L	M	RiskPACC will work with open-source solutions such as OpenStreetMap and integrate crowd-sourcing and VGI solutions into one platform. While this integration is in general possible, the specific needs and details will only be identified through the joint needs assessments in the case studies and might reveal requirements that cannot be implemented from a technical point of view. With the encompassing experience of the consortium and in continuous dialogue with the case studies, the consortium is convinced to be able overcome respective challenges through work arounds.
DR3	Co-creation labs and development phases are not well synchronised	M	M	This risk is closely linked to MR4 and MR5. In the first place, close communication and monitoring of progress should avoid delays. In case that certain tasks and or WPs cannot meet the envisaged timeline, adaptation strategies are developed at the earliest possible stage in collaboration with the Project Officer of the EC.
DR5	Citizen engagement cannot be ensured in case studies	L	M	All selected case study partners are already in contact with citizen and volunteer groups, schools etc. as detailed in the case study overview under section 1.3.2.2.1 of the Grant Agreement. In addition, the number of case studies is high so that risk can be minimised.
IR1	Unsustainable business model for exploiting RiskPACC due to limited resources of interested civil protection organisations	M	H	Building the RiskPACC framework, toolset and knowledge repository on co-creation approaches ensures their match to user-needs and requirements. The additional testing in Efus' cities and regions (WP6) finally derives lessons learned and recommendations. Finally, a roadmap for sustaining the RiskPACC solution after the project lifetime will be developed and hosts for the open-source platform will be screened. Finally, all partners will exploit the

				RiskPACC solution according to the exploitation plans (see section 2.2.2 of the Grant Agreement)
IR2	Exploitation targets not clear, measurable or achievable in the given time frame	M	H	Clear exploitation goals set early, supported by a concise IPR review; exploitation plan covers both incremental improvements and significant development steps - must be realistic, measurable and achievable
IR3	Limited outreach to weak dissemination plan and activities	L	H	Different stakeholder networks have been identified in section 2.2.1 of the Grant Agreement. Partners will continue to identify stakeholders and relevant events during the project duration. All partners will be engaged in planning awareness raising efforts. Finally, RiskPACC will implement and exploit awareness raising, knowledge exchange and peer-learning events. Key impact factors and main communication channels will be determined for different target groups at the beginning of the project.
IR4	Weak media interest due to strong scientific and technology aspects	M	M	Create "user stories" related to the project and solution. Through stories or examples, the consortium shows capabilities and added value of project results. The impact on human beings and society is what will be stressed.
IR5	Dissemination constraints due to classified information	M	M	Only a limited number of deliverables is considered confidential, none is regarded as classified. Confidentiality of outputs is closely monitored. In case of confidentiality, options to report about user experience or similar instead of presenting the information will be explored.
IR6	Limited communication with target groups due to language barrier	M	M	Translation of guidance and training materials to local languages. Translation of dissemination materials into the language of the target group to the extent possible.
ER1	Participation of UK partners is impacted by Brexit	L	H	Brexit negotiations could have impacted the participation of three consortium members - TRI, UoW and UCL. While TRI may continue to operate under its Irish entity, it has been confirmed that UK participants can continue to receive EU funding for the lifetime of Horizon 2020 projects, including those ending after the transition period at the end of 2020.[1]
ER2	Corona pandemic results in sustained restrictions	H	H	Restrictions on social interaction will have several key impacts on the project. Project meetings can be held via tele- or videoconference, drawing on experiences by project partners in how to facilitate such events in the best way possible under these circumstances. Case studies will need to use digital meetings and other forms of non-physical interaction, such as surveys, questionnaires, or interactive tools like games to engage citizens. The consortium has partners with vast experience in methodology, co-creation and interactive / participative methods to ensure co-creation can still take place in the best way possible.

TABLE 4: RISKPACC PROJECT RISKS AND MITIGATION MEASURES

[1] https://ec.europa.eu/info/sites/default/files/research_and_innovation/strategy_on_research_and_innovation/documents/ec_rtd_uk-participation-in-horizon-europe.pdf (29/11/2021)

4. INNOVATION MANAGEMENT

4.1 Innovation Model

Innovation has been defined by many authors and organisations. The EC Green Paper on **Innovation** indicates that the term innovation is commonly used in two different ways: to refer to the innovation process itself (i.e. the process of bringing any new, problem-solving idea into use) and to refer to the result of the innovation process (i.e. a new product, process, service or work practice). An innovation in this sense may be a radical innovation/breakthrough or a product, process or service improvement or an adaptation (European Commission 1995).

There are also several different **innovation process** models described in the literature. Most models start with idea generation to detect possible innovations. In the next step the bandwidth of ideas is narrowed down to select the possible innovations for a project or an organisation. Next comes the actual development or prototyping of the product or service. Subsequently the prototype is tested with possible end-users. The last steps are the market launch of the project (see Figure 4).

FIGURE 4: STEPS OF AN INNOVATION PROCESS **(EVELEENS 2010)**

Innovation management has been described as a discipline that deals with issues relating to how the innovation process could be managed effectively (Harkema and Browrys 2002).

Third generation and newer **innovation models** contain both technology push as well as market pull aspects. Both research and innovation as well as the market have to play an important role. Innovation manager have to balance these two sides (Nicolov and Badulescu 2012; Ceravolo et al. 2016; Buyse 2012).

Within RiskPACC both aspects are covered, see Figure 5.

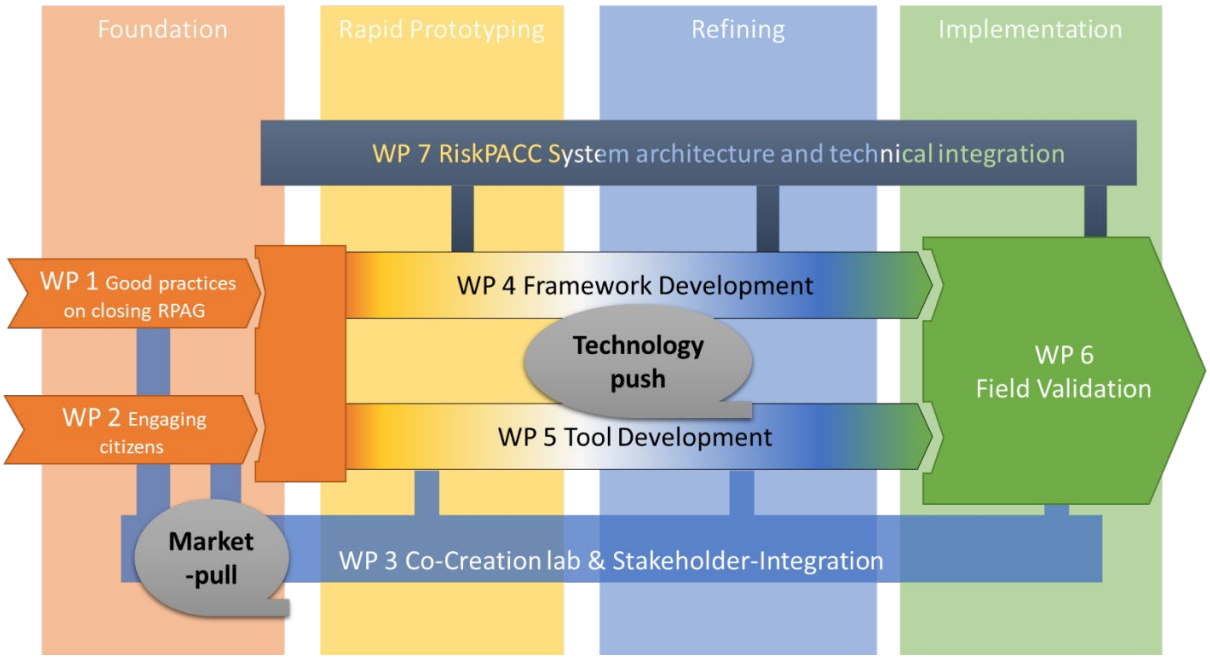

FIGURE 5: RISKPACC WORK PACKAGES

Technology push:

RiskPACC uses ICT technology and social media platforms, which already have an unprecedented impact upon crisis management. For example, they allow for advanced system monitoring, improved analytical capabilities, better coordinated information flow between multiple public emergency-response agencies, and better and faster two-way communication with the public. Utilizing current state of the art technology and social media analytical work helps to not only distribute risk information or early-warnings, but also to improve the situational assessment and awareness for CPA's and citizens.

While the exact adaptation of tools and functions remains to be determined in the co-creation labs in the RiskPACC case studies, the following technologies are envisaged:

- Crowd-sourcing from community
- Crowd-sourcing for environmental assessment
- Crowd-sourcing from publicly available data

Within RiskPACC WP 4,5 and 7 are responsible for using beyond state-of-the-art technology to support preparedness and response to disasters.

Market-pull:

All four phases of RiskPACC (foundation, rapid prototyping, refining and implementation) build on the active engagement of CPAs and citizen organisations. Through co-creation 'lab' sessions with the case study partners, current aspects of the RPAG as well as CPA and citizen needs will be identified in the case study areas.

Within RiskPACC WP3 is responsible to facilitate this collaborative process through the co-creational approach where researchers, developers, and end-users, as well as

civil society organizations and citizens, can jointly design and prototype novel solutions.

The coordinator together with the work package leads are responsible to find a balance between on the one side the exploitation of the opportunities provided by the technical partners in the project and on the other side the active participation of the RiskPACC end-users in the co-creation process.

4.2 Innovation Management

As there will be more than one innovation within RiskPACC it is also of importance to disseminate the current status of the innovations within the consortium, so that all partners are aware of the opportunities and also of current challenges in the innovation process.

Therefore, internal **bi-annual reviews** of the project activities and outputs including their innovation potential are conducted before each second General Assembly quarterly meeting. This review contains also the market positioning, technical and financial feasibility, societal impact, legal and ethical requirements and risk factors of each envisioned innovation.

At this bi-annual review also relevant innovations outside the consortium are reported which might affect the sustainability of the RiskPACC solution. The coordinator will issue a monitoring questionnaire in which the partners will fill in the status of their respective innovations as well as important emerging technologies and context environments outside the consortium.

During the General Assembly meeting related opportunities and challenges are discussed. If necessary, decision will be taken:

- To meet challenges if the innovation potential of a RiskPACC output is less than expected (e.g., development status, usability, user acceptance);
- To adapt the RiskPACC solution to relevant innovations outside the consortium (e.g., emerging technologies, new processes or methodologies);
- To adapt the RiskPACC solution to new standards and regulations.

For the **sustainability of the RiskPACC solution**, work package 8 is dedicated to the dissemination and exploitation of the final output. For example, Task 8.3 will design and create the “Risk Pack” including paper documents and the lab modules as well as training material, so that municipalities, cities and regions receive guidance on how the solutions can be implemented into their organisational structure. Additionally, RiskPACC includes awareness workshops for stakeholders, social media presence, videos and further scientific and stakeholder-tailored publications to promote the RiskPACC innovations to the relevant end-users.

Towards the end of the project a **roadmap for further development and implementation** of the RiskPACC solution will be developed and potential partners and external stakeholders will be screened and consulted to maintain the platform beyond the project duration (see Figure 6).

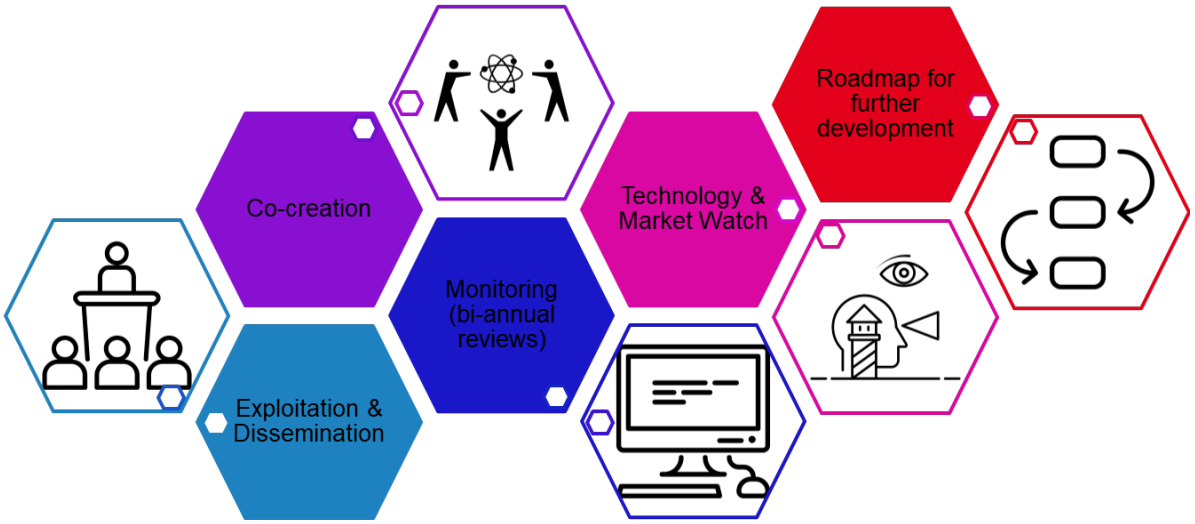

FIGURE 6: ELEMENTS OF INNOVATION MANAGEMENT WITHIN RISKPACC

5. CONCLUSION

The report has presented the basic quality, risk and innovation management strategies in RiskPACC. All three main chapters provide a basis for respective work throughout the project:

Chapter 2, next to defined roles and responsibilities in the project, details the technical management and integration assurance, as well as the internal review process to be followed prior to submission of project deliverables, opting for high quality of project achievements.

Chapter 3 sets the basis for risk monitoring and avoidance of negative impact at different levels. Coordinated by the PC, all partners contribute to identify, analyse and manage risks throughout the project. The risks and possibly respective mitigation plans will be addressed during the regular General Assembly meetings.

Chapter 4 supports actual exploitation of innovation opportunities. In order to ensure effective innovation management in the project, bi-annual reviews of project activities and outputs including their innovation potential will be conducted. Related challenges and opportunities will be discussed in General Assembly meetings.

When the project further develops these basic strategies can be complemented and/or further detailed. One example is the already added additional role of dedicated scientific case study partners. Most likely, other regular meetings will be established based on WP or task specific needs.

6. REFERENCES

Buyse, Kurth (2012): Five generations of innovation models. STRATAGEM. Available online at https://stratagemgr.wordpress.com/2012/09/29/rothwells-generations-innovation-models/, checked on 8/19/2021.

Ceravolo, Stefanovska; Polenakovikj, R.; Dzidrov, M. (2016): Summary of innovation models on a company level - creating a framework for an innovation model that will increase a company's innovation activity. In *Science. Business. Society.* 1 (6), pp. 23–26. Available online at https://stumejournals.com/journals/sbs/2016/6/23.full.pdf.

Eldash, K. (2012): Project Risk Management (course notes). Available online at https://www.researchgate.net/publication/271909639_PROJECT_RISK_MANAGEMENT_COURSE_NOTES, checked on 11/11/2021.

European Commission (1995): Green Paper on Innovation. COM (95) 688 final, 20 December 1995. Bulletin of the European Union Supplement 5/95. Available online at http://aei.pitt.edu/1218/.

Eveleens, Chris (2010): Innovation management; a literature review of innovation process models and their implications. Available online at https://www.researchgate.net/publication/265422944, updated on 2015.

George, C. (2020): The Essence of Risk Identification in Project Risk Management: An Overview. In *International Journal of Science and Research (IJSR)* 9 (1), pp. 973–978. Available online at https://www.researchgate.net/publication/339593332_The_Essence_of_Risk_Identification_in_Project_Risk_Management_An_Overview, checked on 11/11/2021.

Harkema, S. J.; Browrys, M. J. (2002): Managing Innovation Successfully: A Complex Process. In: European Academy of Management Annual Conference Proceedings. EURAM. Available online at https://scholar.google.com/scholar?q=Harkema%2C%20S.J.%2C%20Browrys%2C%20M.J.%3A%20Managing%20Innovation%20Successfully%3A%20A%20Complex%20Process.%20In%3A%20European%20Academy%20of%20Management%20Annual%20Conference%20Proceedings%2C%20EURAM%20%282002%29.

Lavanya, N.; Malarvizhi, T. (2008): Lavanya, N. & Malarvizhi, T. Risk analysis and management: a vital key to effective project management. Paper presented at PMI® Global Congress 2008—Asia Pacific. Project Management Institute. Sydney, New South Wales, Australia. Newtown Square, PA. Available online at https://www.pmi.org/learning/library/risk-analysis-project-management-7070, checked on 11/11/2021.

Nicolov, M.; Badulescu, A. D. (2012): Different types of innovation modeling. In *Annals of DAAAM of 2012 and Proceedings of 23rd DAAAM International Symposium* 23 (1), pp. 1071–1074.

Steen, D.; Tuan Le, Anh (2018): United Grid, Integrated cyber-physical solutions for intelligent distribution grids with high penetration of renewables, Deliverable 1.3 Risk Management Plan. Available online at https://united-grid.eu/wp-content/uploads/2019/08/D1-3-RMP.pdf, checked on 11/12/2021.

The ownCloud Team (2020): ownCloud User Manual.

7. ANNEX

RiskPACC Internal Review Report

The RiskPACC internal review process is described in D9.2.

Internal reviewers, please fill out this review report. In addition, you may provide comments in the deliverable draft, using the comment and/or track changes mode (optional).

Deliverable No. and Title	
Reviewer – organisation	
Reviewer – name	
Date of review	

Clarity of the content **Please answer each question, specify your answer if needed.**	
Are the objectives of the deliverable clear ?	
Does the structure of the deliverable help to convey the main messages ?	
Is it clear how the deliverable supports the overall project objectives ?	
Are the inputs and outputs of the deliverable within the project described ?	
Are the contents consistent with the description in the DoA ?	
Is the level of detail appropriate ?	
Does the Executive Summary reflect the main objectives, methodology and results of the deliverable?	
Does the Conclusion chapter properly describe what the results will be used for?	

Are the expected readers specified?	
Further comments (optional)	
Further suggestions for improvement (optional)	

Formalities **Please answer each question, specify your answer if needed.**	
Is the language, readability and style ok ?	
Are tables and figures properly displayed (e.g. size and readability of text)?	
Is work of others properly referenced?	
Is the deliverable template properly used?	

Overall review result **Please mark ONE option with an « x »**	
Accepted, no changes required	
(Minor) revision necessary, repeated review not required	
(Major) revision necessary, repeated review required	
Not acceptable	

Only in case a repeated review is required – please fill in after revision:

Review result of the revised deliverable	
Have your review comments been properly addressed and implemented ? If no, please explain	
Is another revision required?	

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The RiskPACC Consortium