RiskPACC

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

LAB METHODOLOGY AND GLOSSARY

Deliverable 3.4

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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

The present Deliverable 3.4 provides a demonstrator for co-creational workshops to be conducted in the following project months and beyond. These workshops are to be conducted both internally within the RiskPACC project and externally under the supervision of the case study leaders. The demonstrator will be used as a prototype, or manual for the methodology and will be implemented in the physical Risk Pack and the digital RiskPACC online platform after project-specific iterations. The main objective of this deliverable is to present the practical expertise on co-creational formats of the institutions in charge of this deliverable to the RiskPACC project consortium.

In the process, this document will provide both scientific and practical information that will be used as the foundation for a workshop format based on the co-creational approach. Integrating the co-creational approach derived from practice with political science concepts, such as collaborative governance, we bridge the gap between practitioners and researchers. Scientific research in relevant research fields (such as political science, communication science and psychology) will be elaborated to approximate the estimated impact of the RiskPACC project's co-creational approach. Co-creational core values are identified, and their feasibility elaborated.

The result in the form of a demonstrator is a practical guide that is targeted at the case study partners, yet aims at the audience of scientific and technological partners as well. This is the reason why practical tools and sources are mentioned in addition to the scientific research. The newly developed co-creation workshop is directly aligned to the findings of previous endeavours of the RiskPACC project and supplemented with the project's technology partners' solutions. To link these three domains – the domains of workshop methodology, case studies, and technological solutions – was one main objective to be achieved in the course of this deliverable and its corresponding task within the project. Therefore, we consider the workshops that include a module with technological solutions to be a design artifact.

Acronyms

Abbreviation	Explanation
AR	Augmented Reality
CPA	Civil Protection Authority
CSO	Civil Society Organisation
GPS	Global Positioning System
LGBTQIA+ (and variations such as LGBT) community	The lesbian, gay, bisexual, transgender, queer, intersexual, asexual plus community.
PMT	Protection Motivation Theory (Rogers, 1975; Rogers, 1983)
Risk Pack	"[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" (Grant Agreement, 2021).
RPAG	Risk Perception—Action Gap (Grant Agreement, 2021)
SDGs	Sustainable Development Goals by the United Nations
TPB	Theory of Planned Behaviour (Ajzen, 1985)
UN	United Nations
VGI	Volunteered Geographical Information
VR	Virtual Reality
WP	Working Package of the RiskPACC project

TABLE 1: ACRONYMS

1 INTRODUCTION

1.1 Overview

International structures of civil protection in Europe and European Union's member states are traditionally designed by municipal, county, and national stakeholders for municipal, county, and national stakeholders. However, as the name civil protection suggest, civilians and (non-)citizens[1] should be subject of these activities.

RiskPACC considers practices in risk and emergency management to be at the core of disaster resilience (Grant Agreement, 2021). While former approaches by CPAs have followed a top-down approach in distributing information on disaster management, citizens have not been given the opportunity to collaborate with CPAs and add a bottom-up feedback loop to enable collaboration (Figure 5). "However, […] society's resilience to a range of hazards and threats has been shown to heavily depend on how effectively the interaction between the risk management and learning processes of CPAs, citizens and communities is organised and implemented. Central to such intentions is the need to reduce what we have termed as a Risk Perception Action Gap (RPAG) that forms the basis of the RiskPACC approach" (Grant Agreement, 2021).

The RPAG describes the disconnect between risk perception and action, mainly on the part of citizens (Grant Agreement, 2021). While foregone deliverables of the RiskPACC project further elaborate the RPAG in its scientific understanding and with the project's empirical research, **the present demonstrator will be a tool for the practical diminution of the RPAG**. The objective to implement a co-creation workshop, first within RiskPACC's case studies, and later within more and more participation formats, will reduce the RPAG with "more effective two-way communication and interaction between citizens and CPAs" (Grant Agreement, 2021). To address the RPAG, RiskPACC is "using a co-creation approach that brings CPAs and citizens into substantive dialogue with each other" (Grant Agreement, 2021). The co-creation workshop will be a solution "to facilitate interaction and two-way communication between CPAs and citizens to reduce the RPAG" (Grant Agreement, 2021).

This deliverable "encompasses the lab modules that can be tailored to the case study context for implementing the lab sessions as well as a glossary and guidance material" (Grant Agreement, 2021). The main objective of this document is to deliver a demonstrator[2] of co-creational workshops. These workshops are to be implemented internally in the RiskPACC project, as well as externally under the supervision of the

[1] The terminology of (non-)citizens will further be elaborated in the endeavours of RiskPACC's WP4. For this deliverable, we understand the people living in a designated area, for example a case study region, to be distinguishable by their characteristics to be *either* a person representing a CPA, *or* a person being a civilian/citizen, or non-citizen (refugee, asylum-seeker, internally displaced person, or tourist, e. g.).

[2] RiskPACC's deliverables are defined to be either reports or demonstrators. The Horizon 2020 Work Programme 2018-2020 describes demonstrators as "designs for new, altered, or improved products, processes or services. For this purpose, they may include prototyping, testing, demonstrating, piloting, large-scale product validation and market replication" (European Commission, 2017, p. 1), in this case, "a new or improved technology, product, process, service, or solution in an operational (or near to operational) environment" (ibid., p. 1). Pilot and Prototypes are defined differently in the domain of Design Thinking/the co-creational approach. This demonstrator could therefore rather be described as a prototype.

case study leaders. In internal co-creation workshops, the project partners can use the co-creation methodology to stage workshops on internal processes, such as the co-operation between case study and technology partners. In external co-creational workshops, the case study partners will host workshops that aim to close the RPAG between CPAs and citizen representatives on site. The demonstrator is to be used as a handbook on the methodology, and will be implemented in the physical "Risk Pack" and digital RiskPACC online platform after project-based iterations.

In order for the RiskPACC project consortium to be able to better understand the workshops conducted in the case study areas, (personal) data might be collected. As this workshop's data strategy is based on the project's GDPR information sheet and consent form, we consider the workshop to be data private by design.

1.2 Scope

This document delivers both scientific and practical information that is used to base a workshop format on the co-creational approach. Co-creational core values are recognised, and their practicability elaborated. This demonstrator serves as prototype for the workshops that are to be held during the following project months and after. A glossary on the co-creational lab methodology is added.

By integrating the co-creational approach that is derived from a practical standpoint to concepts of behavioural science, such as collaborative governance, we bridge the gap between practitioners and researchers. Therefore, we consider the workshops, which will include a module of technological solutions, to be an artifact in the sense of Hevner et al. (2004). This will be explained further in → *Chapter 3: Methodology*.

This deliverable in the form of a demonstrator aims to be a practical guidebook, which is why practical tools and sources are cited next to scientific research. The main aim is to present the practical expertise that the institutions possess to the RiskPACC project's consortium. Nevertheless, scientific research in relevant research fields (such as political science, communication science, and psychology) is elaborated to close ranks to the estimated impact of the RiskPACC project and the co-creational approach. The estimated impact will be further evaluated in → *Chapter 2.2.2: Estimated Impact*. As this deliverable is a demonstrator instead of a full report, only relevant terms will be defined instead of presenting full derivations of terminologies as seen in RiskPACC-related deliverables.

1.3 Structure of the Deliverable

This document includes the following sections:

- **Chapter 2: Related Work: Co-Creation**. This Section begins with an explanation of the term co-creation, introducing various definitions from academic literature, practice, and previous research on the subject. Next, various elements related to co-creation are explored, including human, social, and political factors. It also explains the link between co-creation and the workshop formats. Finally, the core values of the co-creational approach are explained and examined in relation to the Risk Perception—Action Gap (RPAG).

- **Chapter 3: Methodology**. In this section we explain the methodology, seeing the co-creation workshops as an artifact and describing this in more detail. First, an overview of the research of the so-called artifact is provided and the steps of the artifact model according to Hevner et al. (2004) are presented and implemented in our work. Afterwards, the RiskPACC project's knowledge baseline, meaning the project's expertise and already found results, is integrated and previous results in the case studies and developments with the technological tools presented. To reach the goal to link the three units of the co-creational methodology, the case study results, and the endeavours of the technological tool development, story-telling user stories are integrated in the workshop process.

- **Chapter 4: Result: Initialisation of the RiskPACC Co-Creation Workshop**. This section brings together all the findings of previous sections to define the final workshop structure. This section can function as a guide and provides all the important information on how the different phases of the workshop should proceed. Step-by-step guides and explanations are handed over on all the workshop's phases. The integration of the co-creational approach within the project is briefly explained as well, again linking back to previous sections.

> ➔ Chapter 4 is the most practical, because it embodies **the focal point of interest to the case study partners**. The case study partners may find the most important information here, with cross-references to the terms and chapters that provide more background information.

- **Chapter 5: Conclusion and Outlook**. The Conclusion of the report includes the main results, limitations, and next steps during the following project months.

- **Chapter 6: Glossary**. The glossary presents short descriptions of relevant terms, as well as some special workshop methodologies.

2 RELATED WORK: CO-CREATION

Co-creation is a practical approach that has been developed in domains such as digitisation and urban or smart city planning. As co-creation is based on participative approaches, it can be linked back to political participation. Although used in applied research, no evidence has been found in research literature that co-creation has ever been linked back to political participation with ties as strong as presented in the following chapters. We therefore close the (research) gap between co-creation and forms of participative governance, especially collaborative governance. The following chapters will first introduce the practical approaches of co-creation (→ *Chapter 2.1: Practical Approaches*) before creating the link to collaborative governance (→ *Chapter 2.2: Scientific Approaches*). Last, indications concerning a co-creational workshop are given in → *Chapter 2.3: Core Values of the Co-Creational Approach*.

2.1 Practical Approaches

2.1.1 WHAT IS CO-CREATION?

The co-creation approach has been included as a frame for the whole RiskPACC project because co-creation aspires to increase the levels of co-operation and collaboration between the project's stakeholders, and in particular CPAs and (non-) citizens (Grant Agreement, 2021).

Co-creation is a process of creation (Dörk, & Monteye, 2011) that "focuses on the cooperation of transdisciplinary actors who jointly address challenges" (Dübner, Fanderl, & Heydkamp, 2018, p. 141). Such challenges tackle "overarching societal goals such as sustainability and resilience" (ibid., p. 141; Mulder, 2014). Therefore, co-creation is a State-of-the-Art, practical approach and fleshed out in participatory formats. The main goal of co-creation is "to develop new and successful solutions to existing problems" (Dübner, Fanderl, & Heydkamp, 2018, p. 141).

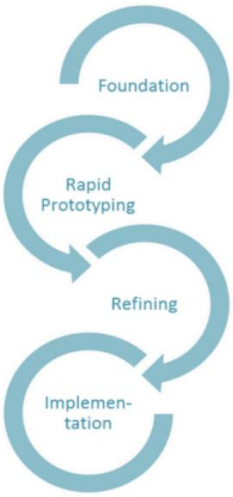

FIGURE 1: RISKPACC CO-CREATION PROCESS (GRANT AGREEMENT, 2021)

The same applies to RiskPACC, where the approach aims at "co-creating solutions and approaches by bringing different viewpoints, voices and data practices into decision-making, and to better understand how local communities and official accounts, perceive and act upon risk and integrate these perspectives in pursuit of greater disaster resilience" (Grant Agreement, 2021). As a result, the overlying process or frame chosen for the RiskPACC project includes the sections shown in Figure 1. These sections specifically apply to the RiskPACC project phases, as the refining of technological solutions will play a major role. Meanwhile, co-creation not only strives for citizen participation, but also for open innovation. Open innovation means "[i]ntegrating a variety of stakeholders in innovation processes and giving them a larger influence on the actual outcome" (Dübner, Fanderl, & Heydkamp, 2018, p. 142).

Apart from that overarching frame for the whole project, the lab format that is intended to improve the communication between CPAs and (non-)citizens also follows the co-creational approach. The concept of co-creation (especially co-creational labs or workshops) is not a fixed term, yet open for interpretation and individual adaptation. Hence, the co-creation workshop structure that is to be proposed for RiskPACC is not *the* universally valid, yet *one* proposed solution.

The co-creational approach has been chosen for RiskPACC's workshop because it is one embodiment of democratic, public participation, or citizen participation. The underlying question is, "how levels of citizen agency, control, and power can be increased" (Organizing Engagement, 2022; Arnstein, 1969). In other words, co-creation aims at a better integration of civic voices in decision-making processes. Their involvement in decision-making processes will lead to a greater "consent of citizens to government activities" (Alves, 2013, p. 677), e. g. Citizen participation should in this sense be put on a par with citizen power – and citizens should therefore not only be involved in the decision-making process, yet also being given the authority to enforce these decisions (Organizing Engagement, 2022; Arnstein, 1969). Herein lies the link to one of the core values of the co-creational approach which foresees participants of a co-creation format to have an equal voice (→ *Chapter 2.3: Core Values of the Co-Creational Approach*). Otherwise, the prospect of engaging citizens will only be tokenism (Organizing Engagement, 2022; Arnstein, 1969): "Participation processes can often leave stakeholders or actors disappointed, as their expectations of participation and actual decision-making exceed reality" (Dübner, & Heydkamp, 2019, p. 24). Some successful implementations of co-creational formats will be set out by way of example next.

2.1.2 Practical Approaches in Digital and City Labs

The practical co-creation approach has been implemented in different digital, urban, and city lab formats. The approach has especially been chosen when targeting interfaces between the digital and real world, aiming for innovation (Dübner, Fanderl, & Heydkamp, 2017). Following the definitions and understandings about co-creation as mentioned above, scholars and practitioners have found co-creational solutions to establish collaboration and civic participation in urban areas.

To give examples, Dübner, Fanderl, & Heydkamp (2018) present their co-creation makeathon in the German city Ludwigsburg that consists of multiple, iterative rounds of makeathons (cf. also Dübner, & Heydkamp, 2019). Makeathons can be counted to co-creational formats (→ *Glossary: Makeathon*). Dörk, & Monteyne (2011) evaluate urban co-creation in North American cities. The authors argue that "urban co-creation strives for a mosaic of transformations requiring loosening control and spreading power. The idea behind urban co-creation is to bridge the gap between professionals and laypeople and allow for intervention, participation, and engagement regardless of social or professional background of participants" (Dörk, & Monteyne, 2011, p. 1). Therefore, urban environments are one suitable test bed for co-creation, as its core values are implemented here already; while, in general, co-creation could be applied in rural areas as well.

The workshops by citizenlab also tackle community engagement in the domain of local resilience (citizenlab, 2021, p. 2). One of the most important points raised is that the Covid-19 pandemic has changed the landscape of public engagement. Even though participatory formats can be transferred to the digital world, face-to-face conversations are most difficult to replace, yet are indispensable for "democratic continuity" (ibid., p. 3). Therefore, the organisation has created a wide range of online tools and resources for digital participative formats. Another configuration of digital collaboration can be seen when looking at examples of the digitisation of public administration and management (cf. Mair et al., 2022, e. g.).

2.1.3 Model Structure of Co-Creational Lab and Workshop Formats

The co-creational formats used in the fields of digitisation, urban innovation and smart cities (s. a.) all follow along the same lines. The basic understanding of the co-creative process (Figure 1) is offering the framework for an even more practical blueprint for co-creation labs or workshops (l. a. Digital.Labor, 2020). The four steps for lab and workshop formats are 1) topic identification, 2) conceptualisation, 3) prototyping, and 4) continuation (ibid.; Figure 2). Following the iterative approach of co-creation (Figure 1), the fourth phase, continuation, has been intended to be a phase happening in the aftermath of the lab or workshop format all along. The four steps will be explained, before the model is tailored to the needs and requirements of the RiskPACC project (Figure 3).

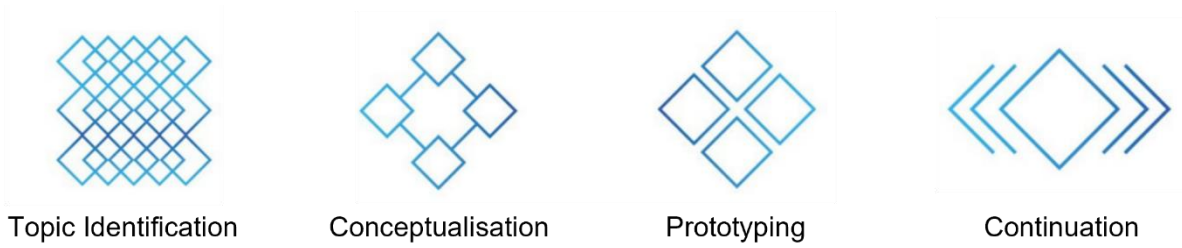

Figure 2: Model Structure of Co-Creational Digital and City Labs (Digital.Labor, 2020)

1) The first phase, topic or problem identification, foresees the organisers and moderators of the co-creational format to come up with and present a topic or problem that is to be solved in the course of the format (cf. Dübner, & Heydkamp, 2019, p. 24; Digital.Labor, 2020). Finding an overarching topic or question for the format can be challenging in itself. Most importantly, the format should not be used "to deliver pre-established policy goals" (Ansell et al., 2020, 573), as these preconditions would prevent true innovation. Instead, there should be "open-ended goals" (Frankowski, 2019, p. 802). The topic needs to be "an ongoing problem or issue of mutual concern [citizens] […] cannot address [individually]" (Booher, 2004, p. 39). Dübner & Krauß (2020) propose that three questions should be set before every lab or workshop, whose formulations need "to find the right framework between a specific challenge and creative freedom. […] If these are spatially too extensive or thematically too complex, targeted processing by the participants is unlikely. The same applies if the questions were chosen too specifically and there is no longer any space for creative approaches" (p. 3). In case multiple questions are chosen, each question will later be elaborated by a sub-group of participants (ibid.). Next to the topics or questions, the organisers should plan on the location (if it is possible to conduct the format on-site), and the tools that are to be used (tangible and intangible tools) (Digital.Labor, 2020).

2) The second phase, *conceptualisation*, first explains the project's, or format's content and context. Afterwards, a creative method of the Design Thinking domain is chosen (→ *Glossary: Design Thinking*) (Digital.Labor, 2020). Such creative methods and possible solutions are first introduced to the participants in order for them to understand the prospect of the format.

3) The third phase, *prototyping*, will enable the participants of a co-creational format to generate conceptual and/or tangible prototypes. Such prototypes "give first impressions of form or functionality, and enable participants to test, reflect, adapt and develop [their previously generated ideas] further. The results are open-source and can be accessed by the city administration, businesses, [citizen] groups and others" (Dübner, & Heydkamp, 2019, p. 25). Sets of tools that are used can be derived from sensor technology, virtual reality, web design, and data science, e. g., and will be bundled individually (Digital.Labor, 2020). Later, the participants will present their, or each sub-group's prototype to each other.

4) As mentioned above, the fourth phase, *continuation*, happens after the lab or workshop is over. The ideas or prototypes generated will be further developed during projects which might transfer these ideas and prototypes to real-life solutions (Digital.Labor, 2020). Generally, the workshop organisers or moderators will stay involved in the process and continue to help the original project's partners.

The model structure of the co-creational digital and city labs (Figure 2) is further tailored to RiskPACC's own needs and requirements. As we will further elaborate in → *Chapter 3.2: Implementation of the Knowledge Baseline* of this deliverable, the project's circumstances and partners offer a certain test bed for the co-creational approach. Therefore, the blueprint of a co-creational workshop to be applied in the frame of this project is tailored to the model structure as proposed in Figure 3.

FIGURE 3: MODEL STRUCTURE FOR RISKPACC'S CO-CREATION WORKSHOP

The first phase, introduction, is to be understood as conterminous to the previous topic identification phase. The main difference between the two model structures is the third phase, which we call collaboration, instead of prototyping. The term has been selected in hindsight to the backlink to the political paradigm of collaborative governance (s. b.). As explained in detail in → *Chapter 3.2.4: Technological Solutions by RiskPACC's Technology Partners*, the technological solutions in development all are digital and intangible. Therefore, the prototyping with tangible material could not apply in RiskPACC workshops. Depending on which creative format is chosen – and specific recommendations will be given –, prototyping can be an optional possibility, yet might not be applicable comprehensively. Due to the Covid-19 situation, the workshops are most likely to be conducted digitally. There are possibilities to prototype with digital solutions (→ *Chapter 4.1.5: Hybrid Workshop Format*). Yet to fully integrate RiskPACC's intangible technological solutions, the focus of the third phase has been shifted from physical prototyping to collaboration in a digital environment. After this model structure has been integrated with the knowledge baseline, the final workshop structure will be presented comprehensively in → *Chapter 4: Result: Initialisation of the RiskPACC Co-Creation Workshop*.

2.2 Scientific Approaches

2.2.1 COLLABORATIVE GOVERNANCE

Co-creation is a concept that has derived from a practical standpoint and has been superficially integrated with civic participation by aligning it to Arnstein's ladder of citizen participation (Arnstein 1969; as seen in Dübner, Fanderl, & Heydkamp, 2017, e. g.). As a result, the quesiton arises whether co-creation can be considered as an application of a greater political paradigm.

Co-creation can indeed be linked back to **political paradigms**, as co-creation formats seek "corresponding governance formats" (Dübner, Fanderl, & Heydkamp, 2018, p. 141-142). In the course of allocating co-creation in the research landscape, we found the applicable terms of collaborative governance, participative governance, or public/ citizen participation, e. g. In the frame of this deliverable, we understand these terms as interchangeable terminologies of the same underlying, democratic paradigm; i. e. the integration of civilians in political decision-making in bottom-up approaches. However, the focus is set on collaborative governance, because it is "a new approach […] that is more deliberative and democratic than traditional forms of public participation" (Booher, 2004, p. 32). Due to the fact that this deliverable is a demonstrator, we mainly present the similarities between the term and co-creation, instead of providing a comprehensive derivation of terminologies.

Ansell and Gash (2008) **define** "collaborative governance as follows: A governing arrangement where one or more public agencies directly engage non-state stakeholders in a collective decision-making process that is formal, consensus-oriented, and deliberative and that aims to make or implement public policy or manage public programs or assets" (p. 544). Likewise, "collective self-governance [...] is defined by both self-determination (citizens' capacity for making, selecting, modifying, applying and enforcing rules), and systematic constraints on that process" (Pitt & Ober, 2018, p. 20). Such systemic constrains could stem from the processes' unfolding in the political landscape of deliberative democracy.

"Collaborative governance […] brings public and private stakeholders together in collective forums with public agencies to engage in consensus-oriented decision making." (Ansell & Gash, 2008, p. 543) Therefore, collaborative processes can be understood as "deliberative" (Ansell et al., 2020, p. 574). **Deliberation** is a democratic paradigm and therefore the next higher-level category collaborative governance unfolds into. Interpreting both co-creation and collaborative governance as deliberative means that the arguments and consensuses found in the exchanges between stakeholders will be used as counselling for (political) decisions on a higher level of authority. As a result, they are an ideal embodiment of bottom-up processes, as "[c]ollaborative governance has emerged as a response to the failures of downstream implementation and to the high cost and politicization of regulation." (Ansell & Gash, 2008, p. 544) (i. e. top-down processes).

In political will formation, top-down processes by the legislation are supplemented with **bottom-up processes** such as popular votes, popular initiatives, mass campaigns, or facultative referendums (el-Wakil, 2022). Such endeavours are often accompanied by organisational actors, such as private institutions or companies, which are able to reach a higher public exposure (el-Wakil, 2022). In RiskPACC, organisations and institutions are part of the process as well. Including them in this process "can increase the capacity of communities, organizations, and individuals to work together in the future to solve collective problems. It can create innovative changes to practice. Finally it can yield new understanding and information to serve as the basis for better decision making in the future" (Booher, 2004, p. 43). As these groups are non-elected representatives, the question arises whether such additional power can be assigned to special interest groups while sustaining the democratic paradigm (el-Wakil, 2022). El-Wakil (2022) argues that it could be democratically acceptable to have non-elected representatives in the empowered space in case they are an embodiment of mini-publics (cf. Lafont, 2015). Embodiments of mini-publics could for example be co-creation formats, or other formats of collaborative governance. In this case, Ansell and Gash (2008) formulate the "condition that stakeholders must be *directly engaged* in decision making" (p. 546, Ed. in. op.).

In that same sense, "collaborative governance is never merely consultative. Collaboration implies two-way communication and influence between agencies and stakeholders and also opportunities for stakeholders to talk with each other. Agencies and stakeholders must meet together in a deliberative and multilateral process. In other words, […] the process must be *collective*." (Ansell & Gash, 2008, p. 546, Ed. in. op.) In the end, "collaborative governance policies are co-created by like-minded

actors" (Frankowski, 2019, p. 794-795). **Two-way communication** is indeed one vital factor for collaborative governance and co-creation: "The communitarian or deliberative approach implies a belief in the value of two-way communication for its own sake, and the possibility of reaching a consensus and engendering a greater common identity. In principle, decision-making should be open and accessible to all" (Callanan, 2005, p. 913). Therefore, two-way communication is considered to be one core value of co-creation that will be further explained in → *Chapter 2.3.1: Two-Step Communication*.

To sum up further, collaborative governance and co-creation are communicative formats for which scholars set different **success criteria**. In order for the communicative formats to succeed, facilitators are required to be "setting and maintaining clear ground rules, building trust, facilitating dialogue, and exploring mutual gains" (Ansell & Gash, 2008, p. 554). Lower levels of trust would in turn "produce low levels of commitment, strategies of manipulation, and dishonest communication" (Ansell & Gash, 2008, p. 553). How to build up trust between stakeholders in collaborative and co-creational formats is therefore tackled in → *Chapter 4.1.4: Recruitment of Participants*. Last but not least, Booher (2004) set up conditions for sucessful processes of consensus-building; the most important being "[i]nclusion of a full range of stakeholders", "[a] task that is meaningful to the participants", and "[a] dialogue where all are heard, respected, and equally able to participate" (p. 35). Herein lies the link to take the approaches of representation and inclusion into account. Representaiton and inclusion play an important role in democratic processes such as collaborative governance. To give an example, "successful collaboration depends on including a broad enough spectrum of stakeholders to mirror the problem" (Gray, 1989, p. 68). As mentioned, commitment is one success criteria, and "only groups that feel they have had a legitimate opportunity to participate are likely to develop a "commitmet to the process"" (Ansell & Gash, 2008, p. 556). Representaiton and inclusion will be handled explicitly in the present deliverable (→ *Chapters 2.3.3: Represenation* and *2.3.4: Inclusion*).

To fully portray the **process of collaborative governance**, the model of collaborative governance by Ansell and Gash (2008, p. 550) is presented (Figure 4). Just like the iterations implemented in the co-creation approach (Figure 1), "the collaborative process is cyclical rather than linear" (Ansell & Gash, 2008, p. 558), or exactly "iterative" (ibid., p. 558). Ansell and Gash argue that the model of collaborative governance (Figure 4) "can be treated as a hypothesis that might be evaluated using a quasi-experimental design" (2008, p. 562). In RiskPACC, this will be conducted in seven different case studies. Hence, we anticipate that the co-creation approach and workshops in RiskPACC will deliver valuable results to shed more light on collaborative processes. Frankowski points out that such "a multiple-case design allows for comparison both within and across cases, to identify empirical explanations that contribute to theory development on collaborative governance" (2019, p. 795). This is a connecting point for the project's and future research.

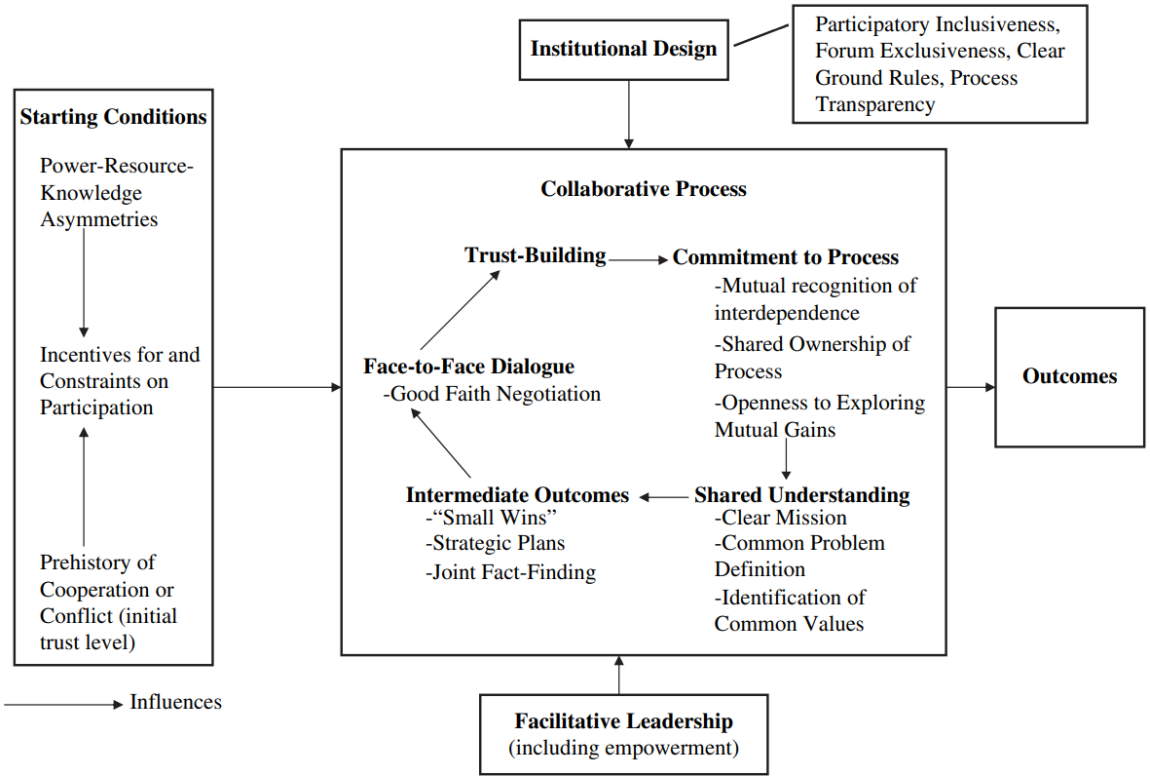

FIGURE 4: MODEL OF COLLABORATIVE GOVERNANCE (ANSELL & GASH, 2008, P. 550)

2.2.2 ESTIMATED IMPACT

The impact that we want to achieve with the RiskPACC tools has again and again been coined to the already existing terms of collective action, or collective agency. In RiskPACC's Deliverable 2.1, collective action is linked to the enhancement of community resilience (cf. ibid., p. 30-32). In other words, the participation of citizens in the RiskPACC project may result in (the improvement of) collective action (cf. ibid., p. 33) or agency. Collective agency is extensively described by Bandura (1998). We argue that the prospect of the RiskPACC project to close the RPAG, i. e. the divide between risk perception and action, can be linked back to citizens' perceived efficacy in acting in the face of disaster. This may both happen on individual, as well as the collective level; a line of reasoning also taken in RiskPACC's Deliverable 2.1. Here, resilience on an individual level is dependent on the "enhancement of self-competence" (ibid., p. 33; Fazey et al., 2021), arguably a term to be used interchangeably with Bandura's concept of personal efficacy (1998). Meanwhile, successful community resilience can be understood as a group achievement. In order for community resilience to be enhanced, we understand a group has to level up its "perceived collective efficacy" (Bandura, 1998, p. 65). As a result, the RiskPACC co-creation workshops may be perceived as successful, if the workshops are able to increase citizens' individual and collective efficacy regarding the action that is to be taken in the face of disasters. This may be achieved by amplifying "[p]eople's shared

beliefs in their collective power to produce desired outcomes" (Bandura, 1998, p. 65); in this case, the 'right' action to be taken in the face of disasters.

Other resilience projects in the DRS01-cluster,[3] which RiskPACC belongs to, prominently address two psychological theories and link their approaches to them, namely the Theory of Planned Behaviour and the Protection Motivation Theory. Both theories provide a playground to link perceived individual and perceived collective action with individual and collective action and behaviour shown in reality. Therefore, both theories are addressed briefly.

The Theory of Planned Behaviour (TPB) operationalised by Ajzen (1985) argues that "human social behavior can best be described as following along lines of more or less well-formulated plans" (p. 11). In the model presented, Ajzen shows that such plans equal the intention to show a certain behaviour. Instead of being able to directly predict a behaviour, influences such as the attitude towards a behaviour, the subjective norm, and the perception of behavioural control can only predict the intention. The intention to act can still differ from the actual behaviour taken in the end. The perception of behavioural control can be linked to the concept of personal efficacy (s. a.) and is the only variable that has an impact on behaviour.

The Protection Motivation Theory (PMT) has been operationalised by Rogers (1975) in the frame of risk communication research. The motivation to show preventive action in the face of a threat is based on the perceived severity of the situation, the perceived vulnerability of the individual person, and the response efficacy (or self-efficacy) (Drambayan, 2011; Rogers, 1983; Rogers, 1975). While risk perception and vulnerability have been extensively defined in RiskPACC's Deliverables 1.1 and 2.1, the focus might again be set on response, and self-efficacy, following the argumentation outlined above. Response, or self-efficacy describes the extent of a person's perceived efficacy to show a coping response in the face of a threat (Drambayan, 2011). If the amount of the perceived efficacy is higher, the protection motivation is higher, in turn leading to a better coping mechanism (ibid.). Moreover, efficacy is proven to be one of the strongest drivers for protection motivation (ibid.).

Combining the concepts mentioned with RiskPACC's prospect, it can be argued that the enhancement of response, self-, and collective efficacy may enable (non-)citizens to increase the amount of resilient action taken (TPB) and the motivation to show preventive action (PMT). We believe that one way to increase efficacy is to establish a two-way communication flow between CPAs and (non-)citizens, which we will further elaborate on next. RiskPACC's approach to tackle the approach of two-way communication is to conduct co-creational workshops.

2.3 Core Values of the Co-Creational Approach

2.3.1 Two-Step Communication

The Risk Perception—Action Gap (**RPAG**) is the main target of the RiskPACC project. While the RPAG can be understood as the divide between citizen's risk perception

[3] RiskPACC belongs to the cluster SU-DRS01-2018-2019-2020. The cluster's topic is "Human factors, and social, societal, and organisational aspects for disaster-resilient societies". The sister projects are: LINKS, ENGAGE, BuildERS, CORE, and RESILOC.

and their action, it can be argued that citizens may act different to how they perceive risk (Grant Agreement, 2021). Risk perception is comprehensively defined in the project's Deliverables 1.1 and 2.1. One main example that can be observed worldwide is citizens' responses to the Covid-19 pandemic. In Deliverable 2.1, it is argued that CPAs did indeed offer resources. However, "[t]he [Covid-19] crisis, and its management, has highlighted the problematic resource dispersion and risk communication, the multiplication of disconnected actions stemming from the differential public risk perceptions and an overall feeling of contradictory statements from the authorities; in other words, it has showcased the need to close the RPAG. Arguably, all these consequences could have been reduced with more effective two-way communication and interaction between citizens and CPAs" (ibid., p. 9). Therefore, two-way communication and its potential to close the RPAG (Figure 5) is further elaborated.

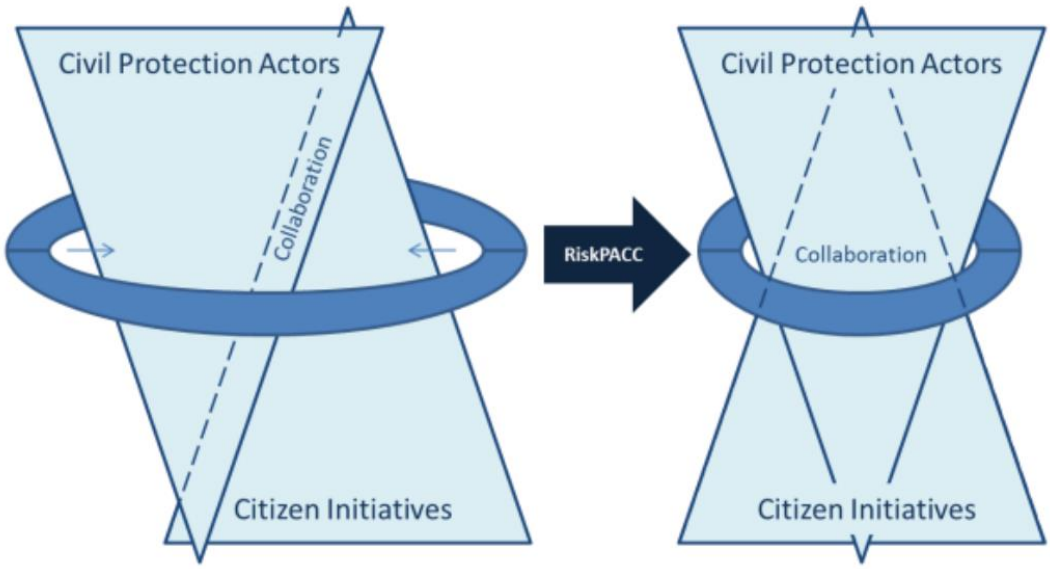

FIGURE 5: APPROACHES TO ADDRESS RISK AWARENESS, PERCEPTION, AND ACTION (CLASSICAL AND RISKPACC APPROACH) (GRANT AGREEMENT, 2021)

Communication is directly linked to risk perception, as explained in detail in RiskPACC's Deliverable 1.1. In the anthropological discipline, "risk perception is the result of a process of social communication" (RiskPACC's Deliverable 1.1, p. 46; Luhmann, 1986). In alignment to this, the RiskPACC approach (Figure 5) links communication to the co-creation process envisioned for the workshops.

Also Arnstein (1969; Organizing Engagement, 2022) sees a one-way information flow between authorities and citizens, which she calls informing, as no real participative approach (ibid.). Instead, she refers to informing as a form of tokenism that doesn't provide citizens with negotiative power (ibid.). Only a feedback-loop, as proposed in two-step communication, can level up the collaboration.

How two-step communication can be operationalised is best explained with the evolutionary approach to two-step communication as seen in Schulz (2014). To get across the best understanding of two-step communication, the communication process models presented by Schulz (2014) are summarised broadly. In general, communication is a dynamic, social process (ibid., p. 169) and is either interpersonal or technologically transmitted communication (ibid., p. 170). When talking about these communication models, the discussion will be targeted towards interpersonal, instead of mass (medial) communication. First, one-way models will be explained, before two-way models will follow.

As one of the most important models of one-way communication, the 'Lasswell-formula' (Lasswell, 1948; Schulz, 2014) of the communication process sets up the basis. The formula asks: Who (communicator) says what (message) in which channel (medium) to whom (receiver) with what effect (effect/reception)? (ibid.) It is apparent that there is no feedback-loop, which is characteristic for a one-way approach to communicaiton. The combination of such one-way communication, and Arnstein's ladder model of citizen participation (Organizing Engagement, 2022; Arnstein, 1969) gives ideas on why communication between CPAs and (non-)citizens fails. Without a feedback loop, communication could fail at every element of the formula. Yet especially the reception of the CPAs' communication could suffer in a field such as risk communication and resilience, because citizens could be enstranged when not integrated or represented in the process.

Moreover, information may be lost during the communicative process. Communication process models indicate lost information due to 'noise' (Shannon & Warren, 1949; Schulz, 2014, p. 174). Such disturbances are further explained in the model by Krippendorf (1994; Schulz 2014, p. 174). Sent information may be exposed to noise, adding irrelevant information, while relevant information can also be lost (equivocation) (ibid.). This leads to a different information output (informaiton received) (ibid.). But how can the reception of informaiton be improved?

In the communication process model by Schramm (1954), a communicator is indicated as the encoder of a message, while the message needs to be decoded and interpreted by a decoder, or recipient (ibid.; Schulz, 2014, p. 176). Adding the same process as a feedback loop, where the former recipient answers, or communicates back to the former communicator, a two-step communication process is established (ibid.). This reciprocal process can also be called interaction (Schulz, 2014, p. 176) and can be understood as the collaboration indicated in Figure 5.

In summary, the RiskPACC approach to communication between CPAs and (non-)citizens foresees the feedback-loop, transforming one-way into two-way communication. The top-down communication directed by the CPAs towards (non-)citizens will be complemented with bottom-up communication by (non-)citizens towards CPAs. As a result, this will enable better collaboration (Figure 5) and interaction. RiskPACC's Deliverable 2.1 already summarises the state of the art of research done on the two-way communicative approach in community resilience (ibid., p. 31).

2.3.2 PARTICIPATORY GROUP

RiskPACC Stakeholders

Who is to participate in a co-creation workshop as proposed by the RiskPACC project? Dübner, Fanderl, & Heydkamp (2018) define the participatory group of co-creation formats as individuals in a "heterogeneous stakeholder landscape" (p. 141). They can be "users, providers, planners and decision-makers" (ibid., p. 142), hinting at diverse roles in one interdependent relation such as an urban environment, or resilience. Therefore, a first look on RiskPACC's stakeholders is taken, while targeting the stakeholders intended as workshop participants.

As mentioned beforehand, the co-creational approach both is implemented project-internally and externally. RiskPACC's stakeholders for the project-internal co-creation process are the project partners. These are diverse partners in research, technology, and practical fields; Scientific, technological and case study partners. In case internal exchange formats will follow the co-creational approach, the same core values should apply.

The stakeholder landscape for external workshops is shaped in the Grant Agreement (2021) and further elaborated in the project's previous deliverables (Deliverable 1.1 & 2.1). Stakeholders relevant for RiskPACC's future co-creation workshops are individuals that are representatives of CPAs or CSOs, or (non-)citizens. The term (non-)citizen will be further explained in the endeavours of WP4. Yet, we can foresee that the participatory group will consist of diverse participants, irrespective of their social or societal role. The characteristics that are interesting in the co-creation workshop are their relation to the community's resilience mechanisms; for example, whether or not they are entrusted with responsibility within a CPA. Which CPAs and CSOs exist in the project's case study communities will be included in RiskPACC's Deliverable 2.2 and can be found in the present deliverable's → Tables 2-5. To round it up, a workshop conducted within a case study area should target individuals that belong to that same area. To later compare workshops held in different case study areas can also offer interesting insights in different adoptions of the workshops related to the form of cultures, i. e. individualistic vs. collectivistic cultures (cf. Bandura, 1998, p. 66). Also, Aronson et al. (2016) argue that groups may act differently according to the form of culture (p. 280).

Equality of Participants

One of the core values of the co-creational approach is to weigh all participants equally, so that their "practical experience[,] […] expertise knowledge[,] and specialized skills [are considered as equally valuable]" (Dübner, Fanderl, & Heydkamp, p. 141). The authors argue that the equality of participants will also establish solidarity (ibid., p. 142).

The equality of participants is especially important in order to reach a degree of citizen participation (Organizing Engagement, 2022; Arnstein, 1969). Citizens' voices do not only have to be heard during the co-creation workshops. Their ideas need to make a real difference, which means that CPAs and other authorities should give citizens the power and authority to these decisions, voluntarily. CPAs need to understand citizen

participation, meaning that an amount of control is handed over to the citizens participating in the decision-making process (ibid.), and only that will pave the way for real, democratic representation.

In a more practical sense, this would mean that facilitators of co-creational formats should give every participant the chance to say something and voice their opinion, not judge or have other participants judge those opinions, and treat all participants equally by considering opinions neutrally.

Group Dynamics

As mentioned before, group dynamics play a vital role in collaborative governance. The group of people participating in a workshop sets the scene for co-operation or conflict. Which one occurs, depends on the group composition and how this group works through four phases of team building (cf. e.g. Stock, 2003, p. 46). These four phases are forming, storming, norming and performing (ibid.). Keeping these four steps in mind will be highly relevant for the workshop moderators.

Whenever a new group comes together to work on a shared goal, like during a workshop with an objective clearly defined, the team to be built enters the forming phase (Stock, 2003, p. 46). During this phase, the relationships between the team members are of high relevance, yet the effectiveness of the team is quite low (ibid.). Therefore, the workshop moderators should entertain some possibilities for the participants to get to know each other. The second phase, storming, possibly contains conflict or confrontation, as the relationships between the team members still are highly relevant and the roles, or standings, of each team member is negotiated (ibid.). Concerning the co-creative approach, the workshop moderators should therefore keep in mind that every team member has the same authority. Every voice should count the same, and conflict should be handled accordingly by communicating the equality of all participants transparently (s. a.). Following the storming phase is the norming phase (Stock, 2003, p. 46). Either verbally or subconsciously, the team members will find a consensus on how to meet the objective at hand and reach the shared goal. Instead of the relationship level, now the (workshop) subject level plays the vital role and will highten the team effectiveness for the first time (ibid.). Yet only in the last phase of performing will the team reach the highest amount of team effectiveness, when both the relationship, and the subject level are equally important (ibid.). During this phase, personal agendas are pushed to the background and the team's goal is put in the spotlight. The workshop moderator should act as a point of contact in case the participants have any questions or problems.

Two main group characteristics should be further explained here. Relevant for the co-creation workshops are group cohesiveness and group diversity. Directly influencing the phases of team building just mentioned is group cohesiveness, which can be defined as the binding, mutual liking, or the commitment of group members with each other (cf. Aronson et al., 2016, p. 273). However, a good group cohesiveness does not automatically accord for good group performance. In case the group avoids conflict too restrictively, it may not find the best solution to the problem at hand (ibid.). "[H]igh conflict per se is not necessarily a barrier to collaboration" (Ansell & Gash, 2008, p.

553). Referring back to collaborative governance, a balance between conflict and problem-solving should be reached, leaning towards co-operation.

The second characteristic highly relevant for groups in co-creational workshops is group diversity. Although group members might feel better in homogenous groups, again creating a higher level of group cohesiveness, a group that is heterogenous and thus more diverse might perform stronger in their ability to find an effective solution to the problem proposed (cf. Aronson et al., 2016, p. 274). Summarising the prior lines of argumentation, "[g]roup performance is the product of interactive and coordinative dynamics of its members" (Bandura, 1998, p. 65). Meanwhile, group diversity is directly linked to collaborative governance due to the democratic approach to representation.

2.3.3 REPRESENTATION

Why is group diversity so relevant for prospects of collaborative governance? With a prominent link to a democratic paradigm, collaborative governance should strive for the best possible representation of the people the policy, or collaboration outcome, concerns. The reason lies with the political debate on representation. In a co-creational workshop, the group members are representing a certain social role such as, e.g., citizen, non-citizen, or displaced person. The participants will bring their own point of view to the table and can therefore represent others with the same characteristics. „[...] [R]epresenting [...] means acting in the interest of the represented, in a manner responsive to them. The representative must act independently; his action must involve discretion and judgement; he must be the one who acts. The represented must also be (conceived as) capable of independent action and judgement, not merely being taken care of" (Pitkin, 1967, p. 209–210).

As a result, many scholars argue that in democratic processes (such as collaborative governance), only members of the same (minority, or vulnerable) group can represent others of that same group (cf. e.g. Mansbridge, 1999). This debate most prominently addresses groups like women (e.g. Mansbridge, 1999; Bernauer et al., 2015) or relatively poorer people (e.g. Elsässer et al., 2017; Bernauer et al., 2015), because structural inequality prevents these groups from receiving political representation (ibid.). In case policies have a tendency of not being an adequate representation, scholars call this phenomenon a skew in responsiveness (Elsässer et al., 2017), or a participation divide (Lijphart, 1997). Linking this back to the project and the prominent question on why a communicative gap exists between CPAs and (non-)citizens, a lack of representation in the communication between these groups could be a problem.

Lack of political representation is also addressed in RiskPACC's Deliverable 1.1. Research on the correlation between political representation and resilience shows: People that are represented more poorly, are less involved and recognised in resilience, i. e. preparedness, response and recovery efforts (ibid., p. 26). There are certain groups of people that are structurally underrepresented, for example immigrants and homeless people (ibid., p. 26). Arnstein (1969; Organizing Engagement, 2022) argues that representatives of vulnerable groups can be outnumbered in decision-making processes (ibid.), but we believe that political will formation in the democratic paradigm can indeed recognise minorities when striving

for consensus. Mapped to co-creation formats, “diversity of the participants [makes] […] the preparation, development, implementation and post-event processing of [a] project […] an interactive, fruitful and interdisciplinary process” (Dübner, & Heydkamp, 2019, p. 24-25). Hence, vulnerable populations are covered next, while carving out strategies on how to better include them.

2.3.4 INCLUSION

As mentioned in RiskPACC’s Deliverable 1.1, “minorities are less prepared for disasters” (ibid., p. 25). Such minorities should be represented in participatory formats, because “those who are not well mobilized to represent their views may become even more marginalized in the process” and “the most marginalized in society are not heard through participatory mechanisms” (Callanan, 2005, p. 915). Linking this understanding to collaborative and co-creation formats, “successful collaboratives pay considerable attention to getting stakeholders to participate and that exclusion of critical stakeholders is a key reason for failure” (Ansell & Gash, 2008, p. 556; Reilly, 2001). Therefore, the co-creational workshops should aim at including people from diverse backgrounds.[4]

From a sociological perspective, inclusion refers to “the process of including ever larger segments of the population in society” (Greve, 2016, p. 146; Parsons, 1975) for “the betterment of social life” (Allman, 2013, p. 3). Inclusion is the fourth stage on a spectrum which describes people’s belongingness to a social group along the stages of exclusion, separation, integration and inclusion. “[S]ocial inclusion and exclusion can [...] contribute to [people’s] governance and control” (Allman, 2013, p. 1). Inclusion in co-creation and collaborative processes can be achieved either with “relationship building” or “strategic inclusion” (Ansell et al., 2020, p. 575).

According to the United Nations (n. d. a), vulnerable populations can include, yet are not limited to:

- Women and girls
- Persons beloning to national or ethnic, religious, and linguistic monorities
- People with disabilities and their families
- The LGBTQIA+ community
- Refugees, asylum-seekers, and internally displaced persons -- groups that are also described as ‘non-citizens’ in our project.

1.) Gender is one socio-demographic factor that alters disaster resilience (cf. RiskPACC’s Deliverable 1.1, p. 24). It is, however, important to highlight that women are not a homogenous group (GFDRR & World Bank Group, 2021, p. 9). This means, that women are diverse within their attributional group. Oftentimes, other factors intersect with gender and can make a person even more vulnerable, which is why the concept of intersectionality is elaborated in societal discourses (cf. e. g. McConnell et al., 2018, pp. 2-4). While gender equality is a political goal stated in the United Nations (UN) Sustainable Development Goals (SDGs; cf. United Nations, n. d. b), gender

[4] To fully illustrate divergent opinions; Frankowski (2019) elaborates on being strategically inclusive vs. exclusive in collaborative processes (cf. p. 803).

mainstreaming is a strategy to reach it (King, 2002, p. 1) (→ *Chapter 2.3.5 Gender Mainstreaming*).

2.) The challenge of language barriers can be addressed when talking about the co-creational workshop envisioned in RiskPACC. The project material's language is English, but it can be presumed that not all workshop participants speak English on a level required to fully communicate needs in resilience. Expectedly, only people with a higher level of education can speak English very well, if it is not their primary language. In RiskPACC's Deliverable 1.1, it is fully elaborated how divides in the levels of education can alter disaster resilience (ibid., pp. 23-24). In order to mitigate this gap, the workshop material is to be translated into the languages of the countries or areas the workshops will take place (the case study areas, e. g.).

3.) According to RiskPACC's Deliverable 1.1, disabilities can be counted to the human factor health. Physical and mental health both influence a person's resilience, while disabled people could face greater challenges during a disaster (ibid., p. 23).

4.) As described with 'gender' above, the self- or external attribution to the LGBTQIA+ community can be understood as a human factor that can intersect with other factors, changing the social standing of a person (McConnell et al., 2018, p. 3-4). When trying to link resilience to impacts toward the LGBTQIA+ community, the problem of a lacking common definition of resilience in research (cf. RiskPACC's Deliverable 1.1) becomes apparent. In research done in this field, scholars are considering psychological resilience. One way of linking back to the project's approach to resilience would be to think about mediators, such as health. "LGBT people experience forms of minority stress shared with other marginalized groups, such as discrimination, [...] prejudice-related life events (e.g., hate crimes), [...] and internalized homophobia" (McConnell et al., 2018, p. 2). Such experiences can impact the physical and mental health of LGBTQIA+ people negatively, which in turn can decrease their resilience.

5.) One of the projects in the DRS01-cluster, which RiskPACC belongs to, also addresses resilience of vulnerable populations. The BuildERS project focuses on homeless people. This group could belong to the beforementioned group of people living in extreme poverty. For homeless people, e. g., physical or social exclusion from social groups can be a severe form of enacting societal hierarchies (cf. Allman, 2013, p. 2). Being excluded from society can "be associated with differential access to social and economic well-being, and differential proximity to illness and disease" (Allman, 2013, p. 2), so that it can be theorised again that exclusion leads to mitigated resilience. Again, the intersection of socio-demographic or socio-economic characteristics can play a role in resilience, as women "account for more than 75% of displaced persons" (Nour 2011, p. 22) in relatively poorer nations.

The vulnerable populations mentioned are covered in the Charter of Fundamental Rights of the European Union (EU, 2012). In Article 21, it is clearly stated that discrimination against such populations is to be prohibited. Instead, the recognition of diversity is to be accomplished (ibid., Article 22). A broader form of diversity can be reached with inclusion of vulnerable groups in decision-making.

Hence, the question arises on how to include vulnerable populations in the collaborative process of co-creation workshops. First of all, the understanding that a diverse group of participants is needed in order to have inclusive workshops needs to be established within the project. As described earlier, the workshop's participatory group is in need for diversity in order to find better and more effective solutions to the problems proposed in the workshop's frames. This is the reason why clear recommendations are handed to the workshop organisers. The workshop organisers need to target a group of participants who are able to represent vulnerable populations.

Workshop participants who belong to one or more vulnerable groups can be contacted directly, such as the elderly, and/or disabled, and/or homeless, and/or people belonging to the LGBTQIA+ community, and/or non-citizens. Possibly problematic regarding real representation are groups that are concerned by the decisions made in the collaborative governance processes that cannot represent themselves, such as people too young or old, and/or with certain disabilities, and/or without digital literacy.

Digital literacy can be a problem in case the co-creational workshops are conducted digitally, and the possible participants are inhibited to use digital solutions. The difference between people who are (better) equipped, or literate, to use digital solutions, and people who are less able or unable to use them, is called digital divide. The digital divide in relation to the internet is due to "inequalities in access to and use of the medium, with lower levels of connectivity among women, racial and ethnic minorities, people with lower incomes, rural residents, and less educated people" (Hargittai, 2003, p. 824). For a more comprehensive understanding, DiMaggio and Hargittai (2001) suggest the term digital inequality, referring to "various dimensions along which differences will exist even after access to the medium is nearly universal" (Hargittai, 2003, p. 824).

Regarding RiskPACC's co-creation workshops, such digital inequalities should be considered. Following Norris's (2001) levels of digital divides, which are global, social, and democratic divides (cf. ibid.), it could be important to compare workshop results from the different case study nations. Especially differences concerning the population of the same nation, broken down to democratic characteristics, should be even more relevant. Thinking about possible workshop participants from some population groups already struggling due to their characteristics outlined above, digital inequalities can once again add to, or have an impact as, intersectional disadvantages. Meeting Wilson's (2000) classification of digital inequality, the RiskPACC co-creation workshops should consider the possibility that relevant population groups in their case study areas might not have full social access to the digital workshop. Social access consists of the four components financial, cognitive, production of content, and political access (cf. Wilson, 2000). When recruiting participants, the case study owners should therefore survey the own area to see whether already vulnerable groups would be excluded due to their digital literacy or inequality. If this is the case, some workshops should be offered on-site, in case the Covid-19 pandemic allows.

All in all, a diverse group of participants is needed because hazards affect population groups very differently. Stated within the SDGs as well (as elaborated in RiskPACC's

Delivarble D1.1), is the prospect to develop pro-poor and gender sensitive strategies to tackle socio-demographic differences. Therefore, differences related to gender are addressed next.

2.3.5 GENDER MAINSTREAMING

The EU Charter of Fundamental Rights specifies the goal of equality between women and men (EU, 2012, Article 23). Therefore, a possibility on how to include women in decision-making processes is addressed here in hindsight to the ethical evaluation of the workshops concerning gender equality that will follow in line with the RiskPACC project's task 3.5. One way of establishing equality between women and men in decision-making processes is gender mainstreaming (King, 2002, p. 5).

Gender mainstreaming is a general trend in the UN to tackle gender equality. It means that instead of correcting old and unequal habits, new actions are evaluated for their use and fairness both for men and women. As a result, equal opportunity, and even more so, diversity among the workforce, can be reached (King, 2002, p. 6). In their 17 SDGs (United Nations, n. d. b), it is clearly stated that the UN works towards creating gender equality. Within the SDGs, it is apparent that gender inequalities make women and girls more prone to the issues of every single goal (ibid.).

Therefore, the UN wants women to be able to participate in politics and political debates more often and more numerous (King, 2002, p. 12). The UN Women department (UN Women, n. d.) works on breaking down structural boundaries that prevent this kind of diversity. UN Women states that multilateral programmes can make a sustainable change, as the same effort every nation or programme would have to do can be co-ordinated by a common board. Both multilateral governments and NGOs are asked to participate and invest, for example in training and education for women. This is how they make their resources more effective (King, 2002, p. 10).

The recognition of women and their inclusion in collaborative governance is so important because hazards affect women and girls, and men and boys very differently. A full report by the GFDRR, & World Bank Group (2021) addresses these differences. To give a few indications, after disasters, women and girls are struggling with their safety and physical well-being, access to medication including contraception, enrolment in education, and financial conditions (cf. ibid.). However, GFDRR, & World Bank Group (2021) identify women as "agents of change" (p. 30), suggesting that "enhancing women's participation in decision making is crucial for building communities' resilience to natural disasters" (p. 30). This is because women need to represent themselves in decision-making in the domains of resilience (ibid.), as explained in detail above (→ *Chapter 2.3.3: Representation*). By enacting gender mainstreaming, "gender dynamics" (GFDRR, & World Bank Group, 2021, p. 30) and "cultural behaviours" (ibid., p. 30) can be transformed, which will result in better disaster resilience.

In conclusion, we recommend lining up the participatory group of co-creational workshops as diverse as possible. While it could be possible that organisers might not be able to recruit participants from every relevant minority group, we strongly advise to try and reach a quota of female and male participants that is 50:50. Of course, the

RiskPACC project workshops should be open towards people of diverse gender as well, who may have to be approached specifically, just like people who belong to the LGBTIAQ+ community (→ *Chapter 2.3.4: Inclusion*).

3 METHODOLOGY

The scientific methodology approaches that are at play for the present deliverable are twofold. First, the artifact approach will be explained, which interprets the initialisation of the co-creation workshop as a realisation of a design process (→ *Chapter 3.1: Artifact Approach*). Second, the knowledge baseline of the expertise brought by case study and technology partners is integrated (→ *Chapter 3.2: Implementation of the Knowledge Baseline*).

3.1 Artifact Approach

As mentioned above, we consider the co-creational workshops, which will include a module of technological solutions, to be a design artifact in the sense of Hevner et al. (2004). The co-creation workshop process initialised is understood as a design artifact because co-creation in urban environments or communities is "collective designing and developing of urban solutions" (Dübner, Fanderl, & Heydkamp, 2018, p. 141). Moreover, the resilience domain communicates "the need of open networks, distributed systems and (in particular) socio-technical systems to solve collective action problems and self-governance issues" (Pitt & Ober, 2018, p. 21). The technological tools provided to RiskPACC by the technology partners should cover such needs and are therefore integrated in the workshop format.

One main objective as proposed in the project description is to bring together both RiskPACC's case study partners, as well as its technological partners. During the development of the workshop format, ideas and core values of both the co-creational, practical approach, as well as concepts derived from social, human and behavioural sciences are integrated. The solution provided within this demonstrator hence is the rejoinder of "the intersection of people, organizations, and technology" (Hevner et al., 2004, p. 98; Silver et al., 1995).

This deliverable belongs to RiskPACC's task 3.2 which is to deliver both conceptual and technical methodologies (Grant Agreement, 2021). This is a perfect fit to the understanding of an artifact in the sense of Hevner et al. (2004), where an artifact will "extend the boundaries of human problem solving and operational capabilities by providing intellectual as well as computational tools" (p. 76). In the unique environment of the RiskPACC project, a research gap can be closed as this artifact will receive "real-world production experience" (Hevner et al., 2004, p. 98), as well as in-depth assessments and evaluations in different RiskPACC tasks (such as tasks 3.1 and 3.5). Task 3.3 specifically aims at tailoring different interpretations derived from the co-creation workshop. Together with a possible comparison of "competing artifacts" (Hevner et al., 2004, p. 100), RiskPACC aims at finding the most suitable approach for closing the RPAG with the help of the workshop format proposed. One more reason why the understanding of the co-creative workshop format as an artifact fits, is that the development of artifacts also include iterations (Hevner et al., 2004, p. 78; Markus et al., 2002), as foreseen in the co-creational approach.

As an interim result of these previous derivations, we present the interpretation of Hevner et al.'s Information Systems Research Framework (2004, p. 80) with items specific to the RiskPACC project (Figures 6-7).

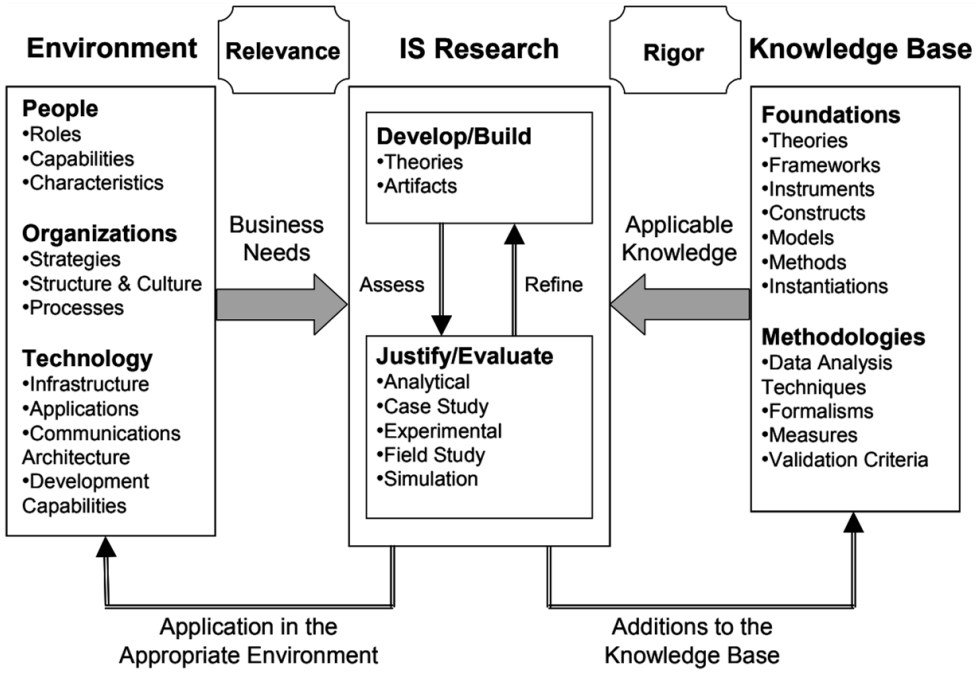

FIGURE 6: INFORMATION SYSTEMS RESEARCH FRAMEWORK (HEVNER ET AL., 2004, P. 80)

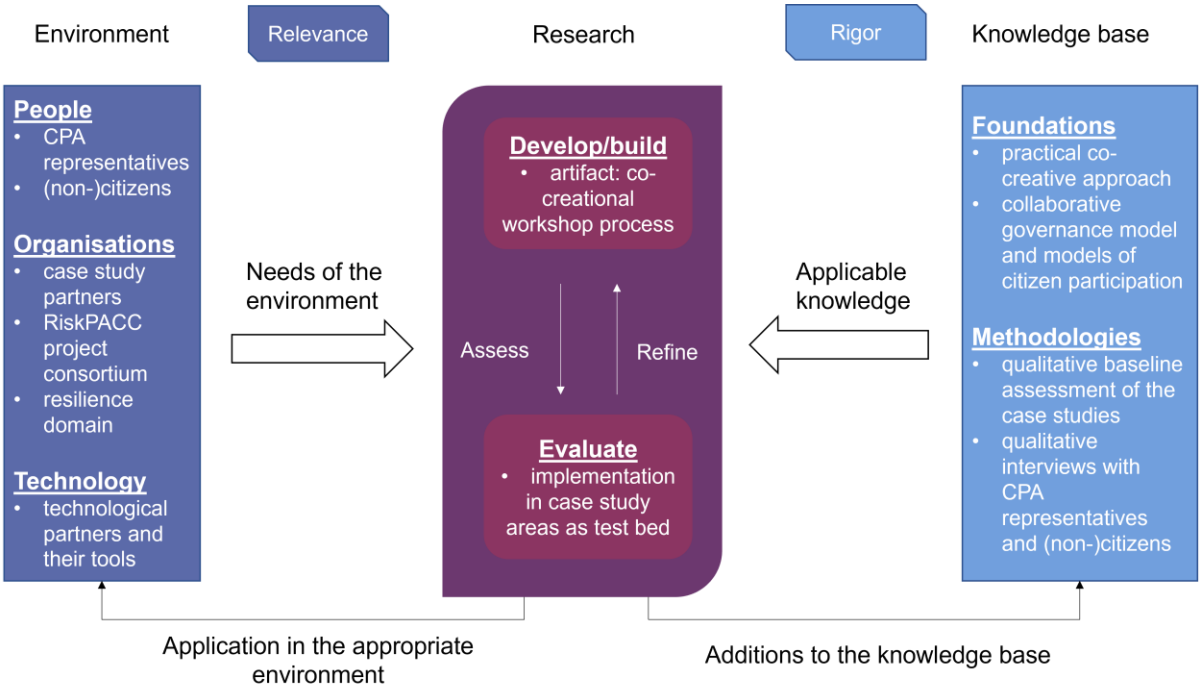

FIGURE 7: COINING THE ARTIFACT APPROACH TO THE INITIALISATION OF THE CO-CREATIONAL WORKSHOP PROCESS OF RISKPACC (FOLLOWING HEVNER ET AL., 2004, P. 80)

In chapter 4, the final result of a co-creation workshop process's initialisation is presented. This workshop process is a process model for the design artifact in the context of research for socio-technical information systems. Finally, our result proposes a procedure model for the co-creational initialisation of innovative organisational and technical solutions involving both users and citizens (→ *Chapter 4: Result: Initialisation of the RiskPACC Co-Creation Workshop*).

3.2 Implementation of the Knowledge Baseline (RiskPACC's Expertise)

One of the main goals of this deliverable is to link the co-creational approach with the RiskPACC project's unique partnerships with case study and technology partners. In this chapter, both domains are explored, with a focus on the expertise relevant for the workshops.

In the RiskPACC project, seven different case studies are considered which all bring different expertise. The case studies can provide specific knowledge that is able to shape the content of the workshop format. Therefore, the workshop will use this knowledge to develop the workshop questions which will be worked upon in the later process of co-creation. In order to do so, the next chapters dive deeper into the case studies and the knowledge baseline derived from the case studies, and the findings from Working Packages 1 and 2 (→ *Chapters 3.2.1 – 3.2.3*).

The RiskPACC project is moreover equipped with the valuable opportunity to work with different technology partners. Therefore, the next chapters also summarise the possible input by the technology partners and their integration to the workshops' content (→ *Chapters 3.2.4 – 3.2.6*).

3.2.1 RiskPACC's Case Studies

To get a better understanding of the case studies, we conducted a categorisation along an integrative content analysis (cf. Früh, 2015). Our aim was to be able to characterise the case studies with an empirically guided category building (ibid., p. 150). The main guiding question to be anwered here was: *What are the most important characterisations that make the case study areas prone to experiencing a RPAG?* The case studies themselves have been pre-selected prior to the project. Therefore, the four steps to implement an integrative content analysis are 1) selection/reduction, 2) bundling, 3) generalisation/abstraction/labeling, and 4) transfer back to the theroetical background/guiding question (Früh, 2015, p. 151).

1) Selection/reduction: To get an overview on the case studies, they have been provided with an inductive item catalogue with open questions and free-text fields. For example, there have been items on the size, the number of inhabitants, and the local surrounding of the case study areas. Out of multiple categories, only the items relevant to the guiding question have been further selected.

2) Bundling: The content of each selected, inductive category with more than one item has been bundled. For example, all the descriptions on local surroundings (s. a.) of each case study area have been bundled to the higher category of 'local scope'.

3) Generalisation/abstraction/labelling: After the items of the relevant categories have been bundled, the characteristics have been labelled. For example, the labels 'local' or 'international' have been assigned to the case study areas depending on their 'local scope'.

Moreover, we characterised the case study areas concerning the typology of natural hazards as seen in GFDRR, & World Bank Group (2021, p. 16), ranging from climatological, biological, meteorological, hydrological, to geophysical hazards. Due to specific directions of the RiskPACC project, the technological hazard category has been added as well.

4) The guiding question applied was helpful because it gave a clear vision on how to make the case studies best comparable to each other. The case study areas are specifically prone to experience a RPAG, because they have been exposed to all different kinds of hazards. While more differentiated reasons on why the case study areas experience a RPAG have been given in RiskPACC's Deliverables 1.2 and 2.2, the present categorisation will serve as an overview.

As a result, we present the following Tables 2-5 as one approach to make the case studies easily comparable to each other. The tables will help the project partners to see similarities and differences between the case studies, and for workshop organisers and moderators to apply suitable workshop methodologies and user stories that will be explained in → *Chapter 3.2.5: User Stories based on the Technological Solutions*. Specific influences by the data derived in the frames of WPs 1 and 2 concerning the case study areas will be elaborated on next.

Case Study	Local Scope	Population	Security Hazard(s)	Geophysical Hazard(s)	Meteorological Hazard(s)
Attica, Greece (MRP)	Periurban	20.266			Extreme temperatures, storms
Brussels, Belgium (IBZ/NCCN)	Urban, rural and periurban	174.383	Terrorism, theft, mass events, cyber security		Cold sprees, heat waves, storms
Eilat, Israel (MDA, MoE)	Urban	68.000		Earthquakes	Extreme temperatures
Lancashire Constabulary, United Kingdom (LC)	75% rural and 25% urban	1.498.300	Terrorism		Storms
Moravian-Silesian Region, Czech Republic (CAFO)	Urban, industrial	289.629		Mass movements, mining disasters	Fogs, storms
Municipality of Padova, Italy (CDP/MDP)	Urban, rural	210.077	Terrorism		Extreme temperatures, storms, intense precipitations
Olomouc Region, Czech Republic (CAFO)	Urban	100.408		Mass movements	Fogs, storms
Pandemic (ISAR)	World-wide, no geological boundaries; countries to be determined				

TABLE 2: CATEGORISATION OF THE CASE STUDIES

Case Study	Hydrological Hazard(s)	Climatological Hazard(s)	Biological Hazard(s)	Technological Hazard(s)
Attica, Greece (MRP)	Floods	Wildfires		
Brussels, Belgium (IBZ/NCCN)	Floods	Wildfires	Epidemic (flu), pandemic (COVID-19)	Chemical accidents (Seveso, e.g.), power outages, nuclear risks
Eilat, Israel (MDA, MoE)			Pandemic (COVID-19)	
Lancashire Constabulary, United Kingdom (LC)	Floods			Industrial risks, nuclear risks
Moravian-Silesian Region, Czech Republic (CAFO)	Floods, landslides	Droughts	Pandemic (COVID-19)	Industrial transport accidents
Municipality of Padova, Italy (CDP/MDP)		Droughts	Insect manifestations (mosquitos)	Factories with high risk of accidents
Olomouc Region, Czech Republic (CAFO)	Floods, landslides	Droughts	Pandemic (COVID-19)	Industrial transport accidents
Pandemic (ISAR)			Pandemic (COVID-19)	

TABLE 3: CATEGORISATION OF THE CASE STUDIES (CNT'D)

Case Study	Early Warning Systems	Critical Infrastructures (CIs)
Attica, Greece (MRP)	GI-Polis	Rafina's port, bus, Rafina's Health Centre Rafina's Police Department, Rafina's Coast Guard
Brussels, Belgium (IBZ/NCCN)	BE-Alert	
Eilat, Israel (MDA, MoE)	Earthquake early detection sensor at schools (EQI alert detector)	Power station, Yoseftal Medical Centre, police, fire and ambulance stations, Eilat harbour, Eilat central bus station, Ramon International Airport
Lancashire Constabulary, United Kingdom (LC)		Port at Heysham, airport (non-commercial) at Blackpool and various critical infrastructure sites including nuclear facilities and sites managed under the COMAH legislation
Moravian-Silesian Region, Czech Republic (CAFO)	Integrated warning service system and flood forecasting service	Transport systems, electricity, public administration services
Municipality of Padova, Italy (CDP/MDP)	Regional alert system	Transports network (railway, highway, main beltway, etc.), electricity network and rainwater sewage system, hospitals (4 main buildings) and other healthcare centres, exhibition centre of Padova
Olomouc Region, Czech Republic (CAFO)	Integrated warning service system and flood forecasting service	Transport systems, electricity, public administration services
Pandemic (ISAR)		

TABLE 4: CATEGORISATION OF THE CASE STUDIES (CNT'D)

Case Study	Volunteer Teams; Civil Society Organisations (CSOs)	Responsible Authorities for Disaster in the Area; Health or Civil Protection Authorities (CPAs)
Attica, Greece (MRP)	ΕΘ.Ο.Ρ.Π- Volunteer Team of Rafina- Pikermi	Fire Brigade of N.Makri, 12th Fire Station of Athens, Rafina-Pikermi Police Department, Region of Attica, Municipality of Rafina-Pikermi
Brussels, Belgium (IBZ/NCCN)		Municipality, Province, The National Crisis Center
Eilat, Israel (MDA, MoE)	Municipality volunteers, MDA volunteers	
Lancashire Constabulary, United Kingdom (LC)	There are a wide range of volunteer agencies including mountain rescue, flood action groups	Lancashire Police, Lancashire County Council, Lancashire Fire and Rescue Service
Moravian-Silesian Region, Czech Republic (CAFO)	ADRA, Crisis Centre Ostrava, Czech Red Cross Ostrava	Region office, Crisis management department, Ostrava City Hall, Department of civil protection, Fire and Rescue Brigade of Moravian-Silesian Region
Municipality of Padova, Italy (CDP/MDP)	Group of volunteers for Civil Protection of the Municipality of Padova	Municipality of Padova, refecture of Padova (territorial branch of the Minister of Interior), Province of Padova, Veneto Region and the Regional Civil Protection Department, National Department for Civil Protection
Olomouc Region, Czech Republic (CAFO)	Charita Olomouc, People in need, Czech Red Cross Olomouc	Region office, Crisis management department, Olomouc City Hall, Department of civil protection, Fire and Rescue Brigade of Olomouc Region
Pandemic (ISAR)		Health authorities

TABLE 5: CATEGORISATION OF THE CASE STUDIES (CNT'D)

3.2.2 RESULTS DERIVED FROM INTERVIEWS WITH CPAS

The goal of RiskPACC's WP1 is to better understand disaster resilience and risk perception, and how CPAs understand and utilize these terms. To understand these terms, a literature review was conducted the examined definitions of resilience and risk perception, and activities that have taken place in different areas by CPAs to increase disaster resilience and risk perception. To take the understanding from research and examine current practices, interviews were conducted with local CPAs in the case study areas (Grant Agreement, 2021). These interviews focused heavily on communication between CPAs and citizens, as that is what most CPAs see as a major struggle in their work to improve disaster resilience. Many of the CPAs interviewed mentioned that there are major gaps between how CPAs view risk and how citizens view that risk and how informed they are. Some said the gaps are because citizens get their information from the news and therefore are not as informed as CPAs, while others attributed the differences in perception to politics. These comments echo what was detailed about the difference in risk perception in RiskPACC's Deliverable 1.1, where previous research noted that CPAs and citizens had very different understandings of risk. A factor that was mentioned as heavily influencing risk perception by communities in local areas was the timing of the last event. Most said that risk perception was high for a certain hazard if that hazard had just occurred, and low if it had been a long time since a hazard struck. This was similarly found in the research for Deliverable 1.1, where timing of an event played a large role in the risk perception of a community. Most CPAs agreed that to increase resilience in their areas, communities need to be better informed as well as be taught how to take action to respond to risks.

Most of the disaster resilience activities undertaken by CPAs interviewed focused on risk communication with citizens. Most of the CPAs conduct information campaigns with citizens as one of their major disaster resilience activities. These information campaigns include activities such as providing leaflets and brochures and creating short instructional videos for websites. Many of the CPAs interviewed remarked that while these techniques have had some limited success, there were different practices that they wanted to try and that they believed might lead to more effective risk communication. Deliverable 1.1 discussed the different methods of risk communication activities, and many of the current techniques used by CPAs had limited success due to the top-down nature of the activities. The same thing was mentioned in these interviews, where a CPA commented on the fact that one way communication was not very effective, and that more community work needed to be done.

In terms of ideas for changes, several interviewees commented that social media and technology were good additions to their risk communication, but could not be the only solution to be used, as social media were not reaching those that were not sufficiently media literate (also l. a. → *Chapter 2.3.4: Inclusion; Digital Divide*). This was discussed as being especially important among vulnerable groups such as the elderly or people living with disabilities, as they may not have any access to the internet. In Israel and Italy, both CPAs mentioned that they would like to conduct training with citizens to help better spread information and understand what citizens are thinking in terms of risk. In

Belgium, new fire departments have been designed to include a room that can be used by the community, therefore increasing the interactions that take place.

As many of the CPAs have mentioned their desire to better spread information to more people in the communities, this could be the perfect opportunity for RiskPACC to use the planned co-creation workshops. Many of the CPAs have noted that citizens are the ones that best understand their local areas, and therefore (better) two-way communication needs to take place. This two-way communication will be present in the co-creation methods for workshops (→ *Chapter 2.3.1: Two-Step Communication*), which will allow CPAs to communicate risk to the local community, as well as better understand how citizens understand and act on risk information.

3.2.3 Results derived from Interviews with Citizens and Communities

The goal of RiskPACC's WP2 is to better understand community resilience, risk perception, and to examine how technical solutions can be used to advance community resilience. RiskPACC's Deliverable 2.1 was written to provide the current state-of-the-art research to gain the groundwork for understanding these concepts. It focused on prior research that had been done in the areas of community resilience and risk perception, as well as provide current technological ideas to increase community engagement in resilience and risk perception activities (Grant Agreement, 2021). Following the review of the literature, Deliverable 2.2 brings together information from community groups in case study areas to understand what is happening in practice. These community group interviewees come from a variety of different groups, and therefore the activities that they work on are diverse. Despite these differences, the majority of the interviewees do not believe that their areas are prepared for disasters. They believe that citizens do not understand risk and do not take enough action to address risks in their area.

Most of the interviewees discussed the lack of interaction between CPAs and citizens. While some said that there was interaction, all noted that the interaction was insufficient. Some noted that the area did not have any idea of the risks they faced and that they lacked an understanding of what do to in the event of a crisis. Additionally, they noted that because of this, the risk perception in the community was low, which was in turn affecting the prevention and mitigation actions in the community. Several other interviewees had similar observations. Many mentioned that this lack of knowledge is due in part to the communication with CPAs. Most have said there is very limited communication, with trainings at schools being one of the few places that any training has taken place. In other places, the interaction between CPAs and community groups is better. For example, in the Lancashire case study in the UK, there are CPAs that work very closely with community groups to help them communicate risk to the rest of the citizens. Even in this case, there are many citizens that are not involved in the community groups that do not receive any information. Communication with these groups has been difficult.

Community group interviewees believe that if communication was better between CPAs and citizens then risk perception would increase, and communities would be more likely to take action. This has been seen in the Lancashire case study in the UK, where community groups were instigating flood defence mechanisms on their own

after training from CPAs. This is one area where the RiskPACC project may be able to assist case studies. There are several ideas that will enhance communication between citizens and CPAs. RiskPACC's co-creation workshops are one possibility to involve both CPAs and citizens and will be a chance for both to learn from each other. The workshops have the potential to increase the interaction between the two groups, therefore increasing risk perception for citizens. The goal is that these workshops will help close the RPAG, by better understanding risk perceptions and increasing communication between these two groups.

3.2.4 Technological Solutions by RiskPACC's Technology Partners

CrowdSense BV (CS), The Netherlands

CS is a partner company from Netherlands that focuses on the development of the technological solution PublicSonar (PS).[5] CS has already collected a lot of data in the past from various open and private sources. Furthermore, they have developed PS as an open-source media together with (CPA) organisations. The technological solution is an online platform that allows searching different sources based on keywords or geographical areas. It receives data from social media and analyses and processes it. Sentiment analysis can also take place, focusing on social media posts by citizens. The tool measures public perception of the actions taken by the CPAs to reduce risk. It will be available in English, and German can be considered.

Institute of Communication and Computer Systems (ICCS), Greece

ICCS is a RiskPACC-partner company based in Greece. ICCS's technological solution aims to provide a bi-directional communication tool between citizens and CPAs to improve co-operation and the information that CPAs are receiving, in relation to the risk of danger. The technical solution supports an Augmented Reality (AR) application for training and e-learning purposes of end-users. It uses geo-referencing to provide information to determine the user's location and potential risk spots. The data provided can be collected in the format of media (video, audio, images, 3D objects, coordinates), registration data, and metadata (e-mail address, username, password). The application will be available in English. The augmented content can also be supported in other languages.

Stam S.r.l. (STAM), Italy

STAM is a RiskPACC-partner company from Italy. STAM has advanced expertise in decision support tools, modelling and simulation, artificial intelligence, automation and robotics, digital solutions, and advanced sensing. The new technological solution designed as a social media website will improve communication between the authorities and citizens and raise awareness for floods and other climatic risks to protect vulnerable populations. Additionally, citizens can voluntarily send information to the authorities in case of an emergency to maximize the speed and effectiveness of the CPAs' response to the emergency. It will be a web-based solution that facilitates communication between CPAs and vulnerable groups. It will be possible to upload photos with associated metadata such as GPS position, user ID and time. CPAs will

[5] https://publicsonar.com/

be able to upload educational material for communities, provide information about communities, and send alerts to users who are in the danger zone. Users can report hazards via an online form. The website will be available in Italian and English.

University of Twente (UT), Belgium

In the RiskPACC project, UT focuses on Volunteered Geographic Information (VGI) with advanced expertise of 10-15 years. UT's main research field has been post-disaster damage assessment with geographic information, in particular remote sensing (RS) imagery, and how to use volunteers in collaborative image analysis, i. e. for damage mapping. The core work of UT in RiskPACC focuses on collaborative image-based mapping. Building on past work on post-disaster damage assessment, other information needs related to disaster risk management (DRM) will be assessed. The plan is not to build operational tools, but rather to generate understanding of how VGI can best support the needs of CPAs in the DRM context. UT wants to develop a methodology to analyse actual information needs and translate them into specific VGI tasks, as well as an approach to prepare available/suitable RS images which will be distributed to specific volunteers. The development and testing of training materials (that are integrated into the mapping platform) provide an overview of the necessary training and can adapt to the needs and performance of volunteers. UT wants to assess the utility of AI/machine learning to support the mapping process, either through initial pre-assessment to prioritize areas to be mapped or matching an area to be mapped with relevant images from social media (ground photos of damage uploaded after a disaster, e. g.). UT also wants to learn about the potential role of gamification to generate more careful (and thus more accurate) contributions, or to generate more long-term contributions if there is a longer mapping need.

3.2.5 User Stories based on the Technological Solutions

To face the challenge of bringing together a co-creational workshop format, the RiskPACC project's case studies, and its technology partners' solutions, we employ user stories. The term user story is not selectively defined, which is why we first explain what kind of user story is used as a methodology for the co-creation workshop. The methodology we use is not a fixed terminology, which is why the explanation is very practical.

Other than in technology domains, our understanding of user stories can be seen as an interface between technological solutions and user experience design. The user stories applied in RiskPACC follow a storytelling approach and are fashioned as story boards. Hence, IT developers would rather describe them as generic scenarios. The benefits of formulating user stories are that the future users of the technological solutions – (non-)citizens – are kept in the focus of the product development (cf. Quesenbery, & Brooks, 2010, p. 2) and, directly connectable to our co-creational approach, the stories "can spark new design concepts and encourage collaboration and innovation" (ibid., p. 3).

A user story for the co-creation workshop is written by having a look at the technology tools and their functionalities. The technological tool is then integrated into a story about a hazardous situation, inspired by the case studies. For example, some case

studies face the hazard of floods, which is how the scene for the application of a technological solution is set. The user story is kept neutral, only describing the tool's functionalities. This is because the user story is to be evaluated during the workshop by the participants. They are to discuss the user story and find out benefits and disadvantages on their own. In hindsight to the evaluation of the participants' discussions on the technological solutions, the user stories can also be "the starting point for a design discussion" (Quesenbery, & Brooks, 2010, p. 3).

The first drafts of the ICCS, STAM and CS user stories can be found in the → *Appendix*. The user story of UT will be written in the following project month. To round up the approach to include user stories to the workshop, we'd like to highlight that other user stories on technological tools can always be written and integrated. In hindsight to iterations and technological advancement, the user stories could look very different in the future. It also offers the possibility for other projects and technological organisations to work in the same field with their own ideas, as addressed in → *Chapter 5.3: Next Steps*.

However, we prohibit technology organisations to use the workshop's user stories as an instrument to push their marketing agendas. The integration of user stories may not be misused to again push a top-down approach of distributing technological solutions to user groups – that would directly contradict the core values of the co-creational approach.

3.2.6 Conceptual User Stories

User stories to be implemented in RiskPACC's workshop do not only have to be based on technological tools. Especially for the case studies handling the Covid-19 pandemic, we came up with two conceptual, partly technological user stories that can be integrated in the workshops.

Contact Tracking Apps

As the case study categorisation reveals, a few case studies are concerned with pandemics, more specific the Covid-19 pandemic. RiskPACC's partner ISAR Germany was specifically interested in contact tracking apps and will align their research to them. To follow their lead, we came up with a user story about contact tracking apps that can be found in the → *Appendix*.

Like the user stories written in collaboration with ICCS and STAM, the user story serves as a first draft and can be changed according to another case study's needs. For example, we covered contact tracking apps in Germany. However, ISAR has provided the project consortium with information on contact tracking apps in many more nations. We would therefore consider the approach to write more user stories on contact tracking apps for the case studies handling the Covid-19 pandemic, focusing on the nation of the respective case study nation.

Nudging

Again for the case studies concerned with pandemics, namely the Covid-19 pandemic, we plan to write a user story that puts nudging into practice. Nudging is a concept in behavioural sciences such as psychology or communication science. "A nudge, as we

will use the term, is any aspect of the choice architecture that alters people's behavior in a predictable way without forbidding any options or significantly changing their economic incentives. To count as a mere nudge, the intervention must be easy and cheap to avoid" (Thaler, & Sunstein, 2008, p. 6). To give an example for nudging that is very easily understood, a nudge used in road traffic is the digital display of an approaching car's velocity. The speed is evaluated on the digital display with smiley faces, for example, a sad smiley face is shown as soon as the car drives faster as permitted. The driver can both alter their behaviour and avoid the nudge very easily – non-compliance will not have any legal consequences. But being exposed to such nudges can persuade a person to comply to a socially desirable behaviour, in the best case without manipulation. The concept of nudging shows similarities with safety and security priming, which are concepts that have also been applied in the resilience domain (cf. Groves et al., 2017, e. g.). Therefore, we consider nudging to be integrated in a conceptual user story to be a perfect fit.

The user story on nudging will be written in the next project month. We plan to include a nudge that deals with vaccinations. Especially the case study from Israel formulated the question of how to motivate (non-)citizens to get vaccinated during the RiskPACC project's kick-off event. We consider the idea of enhancing the willingness to get vaccinated with nudges to be a very good approach, as the idea has already been seized by the media (Wirtschaftswoche, 2021, e. g.). Meanwhile, there is the finding that the approval of vaccinations might remain higher if a compulsory vaccination is not enforced (Cluster of Excellence The Politics of Inequality, 2021, p. 20), which would be a parallel to the nudging concept.

Nudging is a concept that can very well be applied to the user stories and the co-creation workshop because it can even inspire building and testing during the workshop (originally, prototyping). For example, the participants may be presented with the nudging user story, understand the concept of nudging, and think about how to implement nudges in the real-life environment.

The case study categorisation was done to help the project consortium understand the different needs of the case studies related to the workshops and technological tools better. The categorisation should also help with coming up with new user stories in the future, where nudging is only one conceptual idea.

4 RESULT: INITIALISATION OF THE RISKPACC CO-CREATION WORKSHOP

As the result, we present our approach to a co-creation workshop adapted to the RiskPACC project. Derived from the related work and knowledge baseline mentioned in the previous chapters, our workshop model is presented as the centrepiece of this demonstrator. The workshop process is envisioned to be applied and evaluated in the RiskPACC case studies, which is why the descriptions are formulated in a practical, comprehensive way. The step-by-step guides should serve as a manual to enable and empower the project partners to conduct the proposed workshops in their areas.

The subsequent chapters follow the timing of preparing, conducting and processing a workshop format. The activities are performed in the following three major phases:

- Planning and preparation (before the workshop)
- Workshop (1-2 days)
- Continuation (aftermath)

These phases will be explained in detail next.

4.1 Planning and Preparation

Planning and preparation for a workshop should happen with enough lead time. In general, the workshops that are to be conducted by the RiskPACC project can either be internal or external workshops. Internal workshops are co-creation workshops as a part of the project and to be held among project partners. External co-creation workshops are the workshops that are to be conducted with CPA representatives and (non-)citizens, in the responsibility of the case study partners.

As the case study partners will be responsible for the external workshops in the case study areas, help could and should be provided by the designated project partners. This means, a workshop should be led by workshop organisers (i. e., case study partners) and workshop moderators (i. e., additional helpers from the project consortium). Organisers and moderators will form the team of workshop facilitators. Also, we understand organisers to be the official 'faces' and presenters of the workshop, while moderators mainly adopt tasks during the workshop procedure.

One main challenge becomes obvious as soon as the group of case study partners is small, yet the other project partners do not speak the language of the case study area. The workshop material is to be translated into the language of the case study area in order to diminish language barriers (as explained in → *Chapter 2.3: Core Values of the Co-Creational Approach*). As a result, the project consortium has to find a solution in case a group of case study partners is too small to moderate and handle a bigger group of participants.

How a group of workshop organisers and moderators can prepare for a workshop, is specifically addressed below.

4.1.1 PREPARATION FOR THE ORGANISERS

The group of organisers should be manned with case study partners. Tasks to be done by the organisers are the following.

"Define the scope and objectives" (citizenlab, 2021, p. 6): Especially important in hindsight to the workshop is the topic identification that is specifically explained in → *Chapter 2.1.3* and → *Chapter 4.2.1*. This means that the case study partners (with the help of additional project partners, where necessary), will come up with the guiding questions for the workshop. Also, the case study partners (again with the help of additional project partners, where necessary) should read the user stories presenting the technological tools by RiskPACC's technology partners and preselect as many user stories that are applicable to the case study, or as many user stories as there will be sub-groups (s. b.).

"Set a date and time" (citizenlab, 2021, p. 6): The date and time should be set up according to the characteristics of the target group, for example considering people with special needs, with special work hours, or who need to care for others. Also, the organisers will decide what time frame is needed for the workshop. While we estimate that the workshop could be done within one day, the workshop could be set up as a two-day event as well. A 'lunch-to-lunch' meeting could work just as well. The organisers have to work along the workshop structure outlined in Figure 9 to set up the agenda and time slots.

"Set up the workshop" (citizenlab, 2021, p. 6): The organisers need to match the number of the organisers' and moderators' group to the number of possible participants. We suggest the participatory group to be formed by up to 20 people, because they can be separated to sub-groups of 4-5 people very easily, also giving a number of sub-groups that can be handled. Practical experience with workshops shows that workshops with up to 20 people work very well with our approaches. Including a bigger group of people could "result in relatively superficial opinions" (Callanan, 2005, p. 916).

"Define your audience" (citizenlab, 2021, p. 8): According to the workshop's scope and objectives, the target group of participants should be defined. For example, if the workshop is to be conducted online, organisers need to be aware of the consequences that some vulnerable groups cannot be included, as described in → *Chapter 2.3.4: Inclusion*. Therefore, the organisers should try to shape the participatory group as diverse and representative as possible. To the least, a quota between female and male participants of 50:50 should be reached (→ *Chapter 2.3.5: Gender Mainstreaming*). In the multi-lateral approach of the RiskPACC project, language barriers play a role as well. Therefore, a discussion on the advantages and disadvantages of conducting the workshop in English or another – where applies, local – language needs to be held; once again described in → *Chapter 2.3.4: Inclusion*.

"Send out your invites" (citizenlab, 2021, p. 8): "Reach out to the audience you have identified in the previous step. When approaching participants, clearly state what the workshop is about, why they are invited, what is expected from them, and how their input will be used. […] Motivate your invitees by highlighting what is 'in it for them'.

Why should they take the time to participate?" (citizenlab, 2021, p. 8) This means that in the course of sending out invites, the future participants' expectations can be managed. Expectation management is so important for a participatory group because "a group needs to be clear about the group's purpose – why the group exists, what it is setting out to do, and what it is not going to focus on" (Johnson, Willis, & McGinnis, 2020, p. 8) Practical tips on how to recruit participants are given in → *Chapter 4.1.4: Recruitment of Participants*.

"Follow-up on registrations" (citizenlab, 2021, p. 8) means keeping in mind the number of participants, and add more moderators accordingly, if necessary.

"Send information in advance" (citizenlab, 2021, p. 9): The invitation sent to participants should contain specific information on the workshop (for example an agenda, where applies). In case the workshop is digital, the information can include a link to the meeting.

4.1.2 PREPARATION FOR THE MODERATORS

The group of moderators should be manned with additional case study partners and/or helpers from the project consortium. Next to the organisers, the moderators should prepare for the workshop as follows (cf. also citizenlab, 2021).

During the planning of the workshop, the organisers and moderators should meet up to discuss the roles the moderators will take during the workshop. For example, the moderators should split up the tasks related to the workshop procedure and define who is going to do what. One task not to be forgotten is timekeeping. We suggest having a team of organisers and moderators that is at least equal to the number of sub-groups that are to be formed.

Before the workshop, moderators should test the workshop medium, such as the link to the meeting on the virtual tool that is broadcasting the meeting, and other technical setups such as presentations or online tools (where applies). According to the virtual tool, separate meeting rooms for the sub-groups of participants should be set up and tested. For analogue workshops, the moderators should check whether or not they do have all the material needed. Specific information about workshop tools and materials can moreover be found in → *Chapter 4.1.5: Hybrid Workshop Format*.

In case the participants gave their consent by ticking the corresponding options in the GDPR form, the meeting could be recorded auditive or visually. In order to do so, organisers or moderators should check the device(s).

4.1.3 CONSOLIDATION

Table 6 is a consolidation of the points mentioned above. The action items can be ticked by the organisers and/or moderators in order for them to be able to follow all the action items necessary for planning and preparation.

Step	Action Item	✓
0.1	Definition of scope and objectives	
0.2	Setting a date and time	
0.3	Setting up the workshop	
0.4	Defining the audience, participatory group	
0.5	Recruiting participants and sending out the invites	
0.6	Following up on registrations	
0.7	Sending information in advance	
0.8	Splitting up roles and tasks between the organisers and moderators	
0.9	Testing the workshop medium and/or material	
0.10	Testing the recording devices	

TABLE 6: ACTION ITEMS FOR THE WORKSHOP PREPARATION (PARTLY CF. CITIZENLAB, 2021)

4.1.4 RECRUITMENT OF PARTICIPANTS

In order to understand what the recruitment of participants aims at, we have to distinguish again between the project-internal and external workshops. While the internal workshops' goal can be to establish ongoing communication between the project's own technology partners, e.g., the external workshops aim at distributing a safe space for CPA representatives and individual persons. During the latter workshops, the RPAG is to be discussed, and solutions developed in order to close it. While it is not necessary to recruit the participants for project-internal workshops, tools to recruit participants for external workshops are given to hand here. When recruiting participants, the workshop organisers are advised to keep in mind the requirements in terms of representation and inclusivity (s. a.). In reference to WP8's dissemination and exploitation strategy as voiced in RiskPACC's Deliverable 8.1, the ideas to recruit workshop participants are the following.

- **Online outreach**. Workshop participants can be recruited online. Yet, different particularities have to be considered. In order to recruit a representative and inclusive group of workshop participants, digital literacy plays an important role. Organisers have to keep in mind that some populations that are intended as target groups might not be 'onliners', describing the problematic of a digital divide. Or in case they are, there can still be different obstacles, such as mitigated accessibility of web content to people with disabilities.

    - The **RiskPACC project website** is intended to be an information hub for anyone interested in the project. The website offers an **event calendar** (https://www.riskpacc.eu/events/), where the different workshops in the dedicated case study areas can be placed. The event calendar can show past and future events, including the workshops, and could offer an online form to sign up for a workshop. This is common practice on a lot of websites like this. It is agreed with WP8 that case study workshops can be added to the event calendar, given that the organisers provide sufficient information on the event. It will also be

beneficial for the project's exposure to have an online record on which, and how many, workshops have taken place thus far.

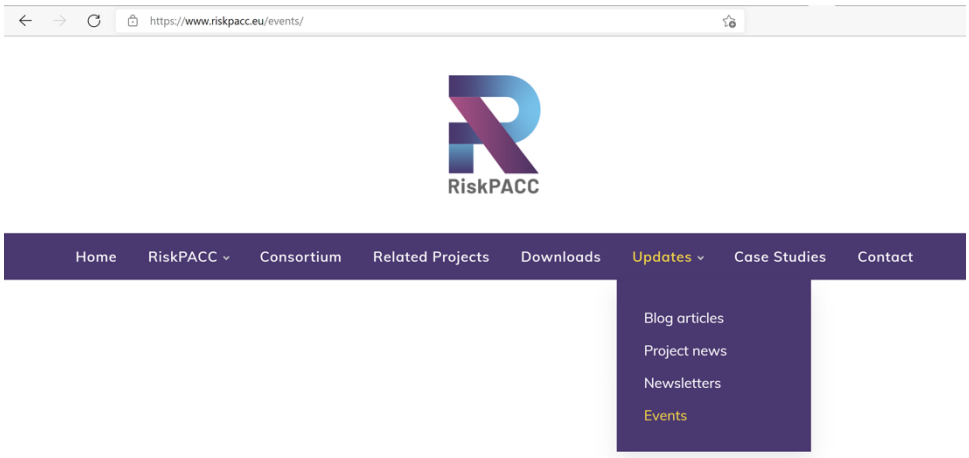

FIGURE 8: THE RISKPACC'S PROJECT WEBSITE'S EVENT CALENDAR

- Concerning the **project's own** existing **social media accounts**, it has to be distinguished between their accessibility to the open public. While content on the open RiskPACC Twitter account is accessible to any internet user, the RiskPACC LinkedIn page is a group only accessible after logging in on the platform. Therefore, organisers have to keep in mind what kinds of people can, and cannot be recruited online. Twitter and LinkedIn would have been selected to their relative proximity to the three target groups identified in RiskPACC's Deliverable 8.1. However, the workshops' target groups could differ, as it is not only formed by representatives of CPAs, but also individual persons.

- Social media is connecting people of the same geographical areas or with the same interests. Hence, it could be a suitable approach to share invitations via an **individual project partner's social media account or website**. Especially in case the workshops are able to take place on-site, this approach will help with recruiting participants of the same areas, thinking of the case study areas in particular. The project partner's social media accounts or websites could particularly help with recruiting individual persons. The possibility to have the project partner's accounts share the invitation provided by the project's account exists as well.

- **Tangible invitations**. Physical invitations such as flyers or brochures might be an approach to balance out the digital divide or other problems of accessibility. For this project, the cost-benefit ratio has to be kept in mind. It could be considered to be too inefficient to print invitations for the workshops that aim for a group of approximately 20 people. Yet this approach could be kept in mind if workshops are lacking representative participants of certain populations.

The communication before the workshop is the **first contact** with future participants. During the project's lifetime, the workshops may gather data of the participants – be it contact information or recordings of the workshops' contents or results. Therefore, it is recommended to collect declarations of informed consent according to GDPR standards right away, with reference to the declarations prepared in the frame of WPs 1 and 2 and their surveys (→ *Appendix*). The data protection consent forms can be distributed by the project, yet may be subject to change, especially after the project is officially over.

Moreover, the first contact with potential participants should be engaging and positive. The first contact is important in order to **establish trust** between the workshop organisers and the possible participants. In RiskPACC's Deliverable 2.1, it is stressed that community resilience relies on "communication channels and 'trust-ties' between communities and other local stakeholders" (ibid., p. 44). Trust is also considered to be a social cohesion factor, which is both linked to social capital and therefore to disaster resilience (cf. RiskPACC's Deliverable 1.1, p. 25).

Such "'trust-ties' between individuals" (Deliverable 2.1, p. 32) are coined as **social capital** (ibid., p. 32), a term that can is moreover related to social support: "The concepts of social capital and social support both refer to the manner in which individuals benefit from each other based on their encounters, interactions, empathy, or mutual understanding" (Trepte, & Scharkow, 2016, p. 304). Such ties can range "from close-knit friendships to loose acquaintanceships" (ibid., p. 305). Social support has the potential to "help people in their day-to-day lives, as well as in particular circumstances (ibid., p. 306), indicating a link to resilience. For RiskPACC, social capital or social support will play a role because in order to close the RPAG, CPAs and (non-)citizens need to form closer, trustful ties between each other, i. e. establish social networks.

The term **social network** "refers to a more formalized link between a number of independently operating organizations and individuals with a mutual interest to coordinate their efforts to achieve their separate goals. A collaborative *network structure* goes beyond linkages and coordination; the participants must actively work together to accomplish shared goals" (Booher, 2004, p. 39, Ed.). Social networks play a vital role in resilience (RiskPACC's Deliverable 1.1, p. 25), because resilient actions are tributary to co-dependence. RiskPACC's workshops are intended to establish ongoing and trustful communication between the project, CPAs, and (non-)citizens or CSOs. In Deliverable 2.1 it is argued that a relationship based on trust can bridge the RPAG, which is RiskPACC's intention (ibid., p. 44).

4.1.5 Hybrid Workshop Format – Analogue and Digital Equivalents

The workshop has been designed to be conducted either on-site, or virtually, depending on the participants' mobility and the current Covid-19 situation in the case study areas. The following Table 7 will present analogue and digital equivalents which serve as tools to be used in the workshops.

As the technological solutions by RiskPACC's technology partners are intangible, there aren't any technological prototypes or products to be shown to the participants.

Otherwise, they could have been integrated: “Digital and analogue materials donated by local companies and acquired by the project team, together with the tools to make use of them are the basis for the co-creative process. Mentors support participants to use the materials enabling them to familiarise themselves with previously unfamiliar materials” (Dübner, & Heydkamp, 2019, p. 25).

Instead, the organisers and moderators should get familiar with the tools provided below and make up their minds on which tools are best suited.

Analogue tools	Digital tools
Physical spaces, for example • Meeting rooms • Conference rooms	Virtual broadcasting tools, for example: • https://www.microsoft.com/EN-GB/microsoft-teams/ • https://zoom.us/ • …
Stationery whiteboards	Online whiteboards, for example: • https://conceptboard.com/ • https://miro.com/ • …
Tangible prototyping tools, for example: • Lego® Serious Play® • General workshop material, s. b.	App or website prototyping, for example: • https://wix.com/ • …
General workshop tools, for example: • Pens, highlighters, paper, posters, glue, scissors, a watch, …	
Notebooks or laptops, smartphones or tablets to enable digital co-work or testing of prototypes on site	

TABLE 7: ANALOGUE AND DIGITAL EQUIVALENTS OF WORKSHOP TOOLS

4.2 Workshop (Final Co-Creation Workshop Structure)

As the result of the previous endeavours, we present the final co-creation workshop structure that is initialised in the RiskPACC project (Figure 9). The workshop consists of four phases that will be explained in detail in the following chapters. Each phase consists of different modules. Especially the interchangeability of the modules in the *conceptualisation* phase shows the workshop’s agility and flexibility. Moreover, the decision on the agenda and timing is confided to the case study partners, as we believe they will be equipped best to make this decision according to the case study area’s population and culture. Therefore, the case study partners can assign a time limit to each module, also setting up the workshop for one or two days.

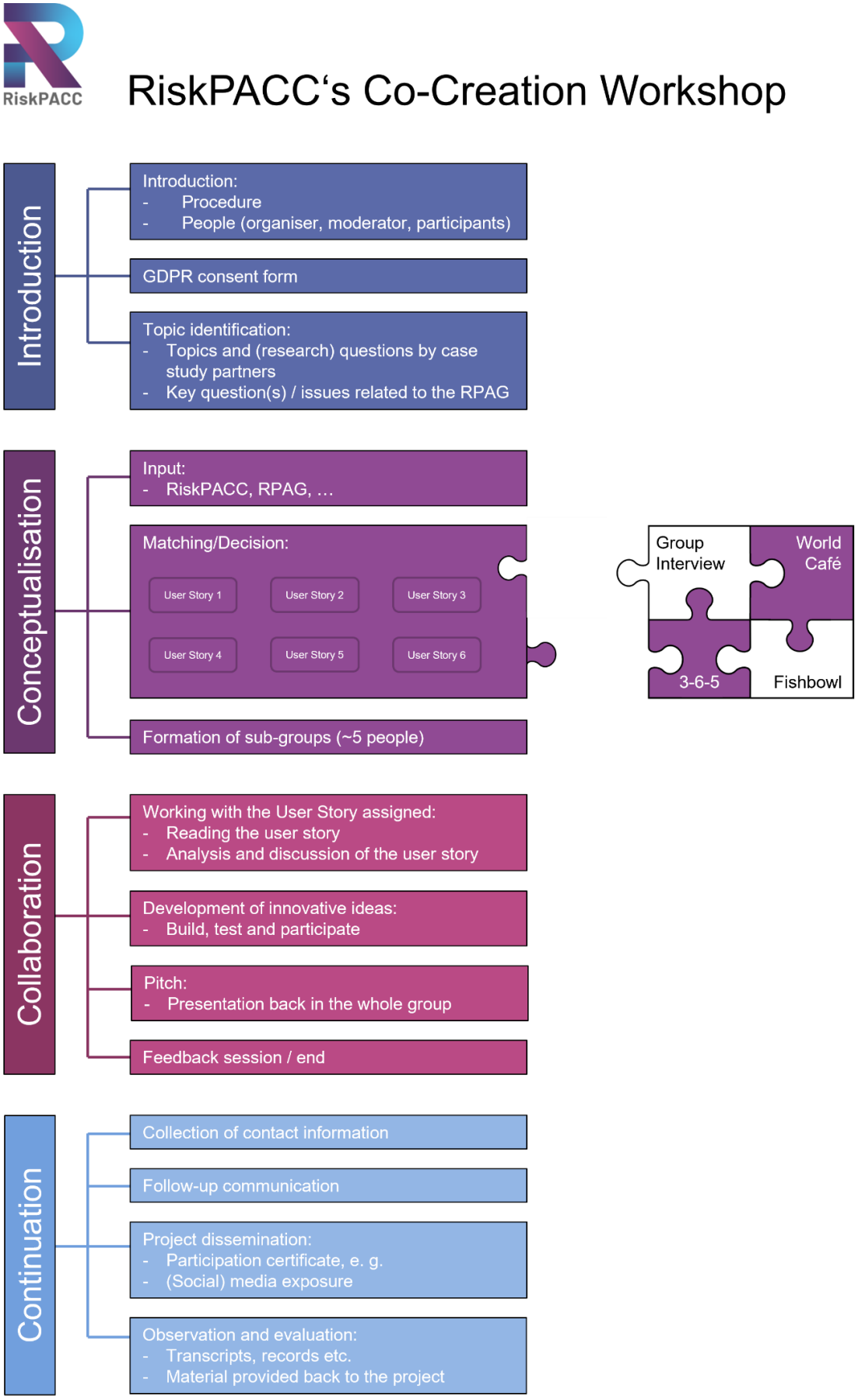

FIGURE 9: RISKPACC'S CO-CREATION WORKSHOP STRUCTURE

4.2.1 INTRODUCTION PHASE

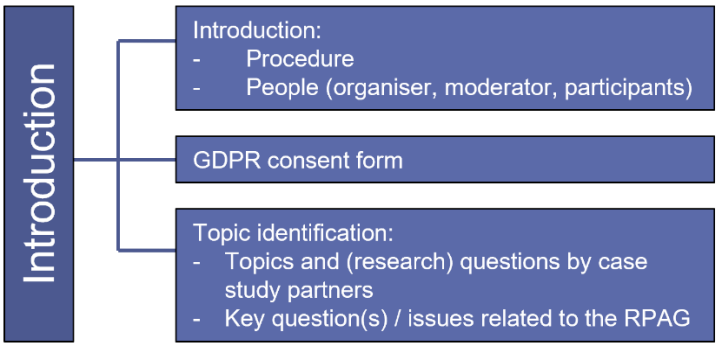

FIGURE 10: INTRODUCTION PHASE

Overview

Starting the workshop during the *introduction* phase (Figure 10), the organisers and moderators will present the procedure of the workshop to the participants. Before or after this explanation, the organisers and moderators should introduce themselves and give room for the individual introductions of the workshop participants. Afterwards, legal issues concerning the protection of the participants' personal data are addressed. As the last part of the introduction, the topic and aim of the workshop and, where applies, the (research) questions by the case study partners will be presented. There also has to be a presentation of key questions and/or issues related to the RPAG, to give the participants a first idea of the project's outline and to have a better flow between the *introduction* and the *conceptualisation* phases.

Introduction

The organisers and moderators can choose whether to start the workshop by introducing themselves or the RiskPACC project in general. To explain the procedure of the workshop to the participants is important because they will bring certain expectations. In the best case, the expectations will already have been managed during the invitation process of the workshop. However, on site, the organisers and moderators should answer the question why the participants are present that day. The reason for this is that the participants can be of all different kinds of people, and a motivated and highly involved person will most likely want to know what exactly they are going to do during the workshop. The presentation of the procedure of the workshop can indeed be its agenda, following the phases of the workshop and saying a few general words on how the workshop will proceed. The organisers and moderators should explain the basic rules of the workshop, for example how they want the participants to treat each other equally and respectfully, as has been explained in detail in → *Chapter 2.3.2: Participatory Group*.

The organisers and moderators should introduce themselves by showing their involvement in the RiskPACC project and the case study. They can explain what exactly the case study is doing or has been working on in the past. The floor should

then be given to the participants to introduce themselves as well. The organisers and moderators can choose a game to make the group get to know one another better and to enable group building (see → *Chapter 2.3.2: Participatory Group; → Glossary: Get-to-know-you or icebreaker game*).

GDPR consent form

The project strictly follows the GDPR regulation and offers a data information sheet and consent form as provided by RiskPACC's WPs 1 and 2, which can also be found in the → *Appendix*. While the invitation sent out to anticipated participants should already include these documents and a transparent note on the collection and handling of data, the filled-out GDPR consent forms should in the best case have been submitted back to the workshop organisers/moderators before the workshop starts. In that way, the legal/compliant recording of the workshop is possible, if the participants gave their consent in the document.

After the workshop participants have once again been reminded that there will be a kind of recording or documentation, depending on the forms of consent given in the GDPR consent forms, the recording can start.

As the workshop participants have introduced themselves before the audio- or video recording has been started, the audio or video file will be more data private. In case the workshop participants refer to each other by name, the transcripts, summaries, or other forms of documentation which are shared within the project have to be factually pseudonymised. This means that the project consortium will not be able to (re-)identify individuals that have been participating in a workshop. Action items on documentation and factual pseudonymisation will be presented in the *continuation* phase (→ *Chapter 4.3: Continuation*).

Topic identification

During the planning of the workshop, the case study partners, and additional moderators derived from the project consortium have already come up with topics to be discussed during the workshop. Depending on the case study, this can also be a (research) question. More information on finding a topic and how to formulate it has been given in → *Chapter 2.1.3: Model Structure of Co-Creational Lab and Workshop Formats*. Up to three topics or questions should be presented that are neither too narrow, nor too broad. The topic or question chosen should always give room for the participants' creativity.

Moreover, the chosen topic should first be aligned to the RiskPACC project's key questions or issues related to the RPAG. This means that either right after presenting the guiding question, or as the first item of the conceptualisation phase, the project and RPAG should be explained. This will give the workshop participants a first idea on why the workshop questions have been chosen.

Step	Action Item	✓
1.1	Introducing the organisers, moderators, and the RiskPACC project	
1.2	Presenting the workshop procedure	
1.3	Giving room for the participants to introduce themselves	
1.4	Collecting missing GDPR consent forms	
1.5	Starting a recording, depending on the participants' consent	
1.6	Presenting and explaining the workshop's topics and (research) questions	
1.7	Linking the topic presented back to the key questions of the RiskPACC project and the RPAG	

TABLE 8: ACTION ITEMS FOR THE INTRODUCTION PHASE

4.2.2 CONCEPTUALISATION PHASE

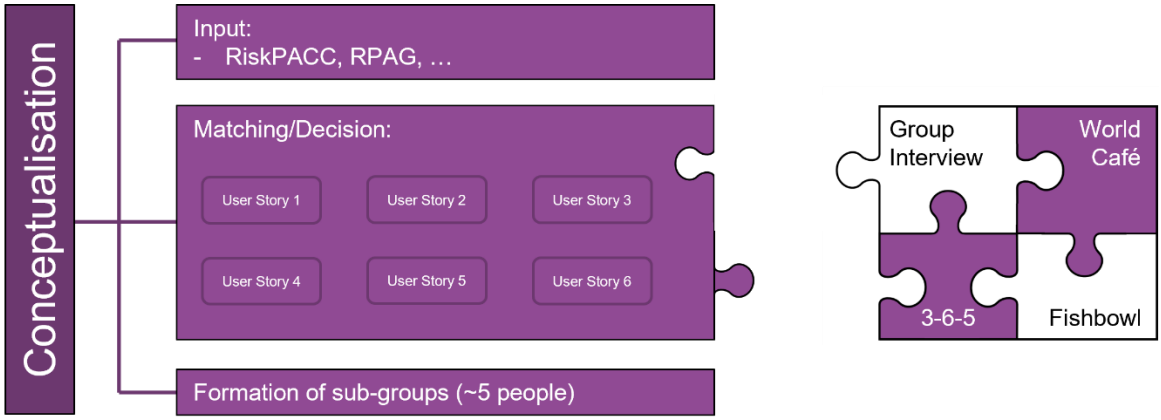

FIGURE 11: CONCEPTUALISATION PHASE

Overview

In the *conceptualisation* phase of the workshop (Figure 11), more in-depth input is delivered concerning the RiskPACC project and/or the RPAG, depending on which information has already been given during the *introduction*. In this phase, the methodology that has been chosen by the organisers and moderators will be presented and explained to the participants. The methodology suggested is the implementation of the user stories. However, not every case study could be able to integrate a user story to their workshops. Therefore, other methodologies can be chosen. Last, the participants are separated into sub-groups.

Input on RiskPACC and the RPAG

The case study partners can present the input on the RiskPACC project and/or the RPAG[6] that is relevant to their case study and the topic identified or (research) question posed for the workshop. This information is allowed to be very detailed and specific, as the workshop participants might not have heard about the issues of the communication between CPAs and (non-)citizens ever before.

Matching/Decision on a workshop methodology

The real work on topics and research questions happens in the later *collaboration* phase. In the *conceptualisation* phase, one methodology is chosen that will merely be explained to the participants. The organisers and moderators will give instructions and explanations about the chosen methodology. This means that the organisers and moderators should have made up their minds on how user stories could be matched with their case study. The organisers and moderators will either have their preselection of user stories ready or have chosen another methodology.

In case a preselection of user stories has been made, every user story can be introduced shortly. This is to motivate the participants and establish involvement and motivation for the user stories' topics. In case one user story is specifically written for the case study, such as the user story on contact tracking apps for the pandemics case study, only one user story might be presented to the plenum, that can nonetheless be handed over to separate sub-groups (s. b.).

As visually represented in Figure 11, the workshop model allows for the exchange of the user story module with other workshop methodologies. Although we strongly advise to choose user stories for the case study workshops, they may still not be applicable for every workshop. Therefore, other methodologies can be chosen that are explained in more detail in the → *Glossary*. The organisers and moderators are advised to get familiar with the different possibilities, while help is given on the execution by project partners from RiskPACC's WP3. The possibility to mix and match, or use the methodology modules interchangeably, makes the workshop as agile and flexible as demanded in the Grant Agreement (2021).

Formation of sub-groups

Either by being assigned to a user story or one of the topics or (research) questions posed, sub-groups will be formed. We advise to have sub-groups with up to 5 people. Once again, the ideal is to have some sort of diversity in the sub-groups again, to not diminish the inclusion approach taken in the previous steps. Every sub-group should be accompanied by at least one organiser or moderator (cf. Dübner, & Krauß, 2020, p. 3), i. e. one representative of the organising institutions or partners. In case the workshop is conducted virtually, separate virtual meeting rooms can be set up and the participants assigned to these rooms. The work to be done in the sub-groups will further be explained in the *collaboration* phase.

[6] The best pieces of information can be found in the Grant Agreement (2021) and the previous deliverables, which is why it would be thinkable for the project consortium to come up with consolidated information on RiskPACC and the RPAG after the current deliverables have been handed in during February.

Step	Action Item	✓
2.1	Presenting in-depth input on the RiskPACC project and/or the RPAG in relation to the case study	
2.2	Presenting and explaining the chosen workshop methodology, e. g. the user stories	
2.3	Forming sub-groups and separating these groups physically or virtually in team rooms, e. g.	

TABLE 9: ACTION ITEMS FOR THE CONCEPTUALISATION PHASE

4.2.3 COLLABORATION PHASE

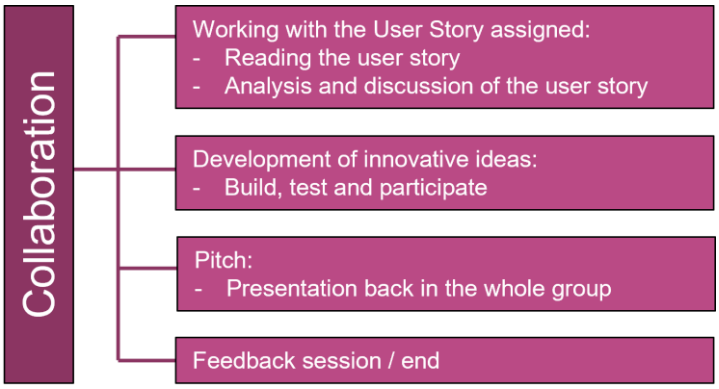

FIGURE 12: COLLABORATION PHASE

Overview

In the *collaboration* phase (Figure 12), the assigned user stories will be read, then analysed and discussed. Inspired by the co-creational lab and workshop formats, where prototyping would follow during this phase (→ *Chapter 2.1.3: Model Structure of Co-Creational Lab and Workshop Formats*), we integrated a module where the ideas developed during the work with the user stories, or some new ideas, could be gone ahead with. Participants can build, test and participate in the exploration of innovative ideas. In the focus of the *collaboration* phase stands creativity: "Co-creation formats encourage creativity in the development of innovative and multi-demand solutions through the integration of heterogenous actors" (Dübner, Fanderl, & Heydkamp, 2018, p. 142). Afterwards, the sub-groups will join back together, where the results of the working sessions will be pitched. In the end, the group will give feedback to each other, as well as the organisers and moderators. The organisers and moderators will then end the workshop.

Working with the user story assigned

In case the workshop will be handling user stories, each sub-group will handle one user story. The user story is written in a neutral way. This will enable the participants

to come up with their own conclusions while evaluating it. The participants can, for example, give indications on what they like and dislike about the story or how the technological tools work. They can line out benefits, advantages, and disadvantages. Such evaluations will give the technology partners more information on user and system requirements. Nevertheless, working with the user stories and thinking about the technological solution should give room to the participants to elaborate first possibilities on how the RPAG could be closed.

Development of innovative ideas

Depending on whether or not a user story has been integrated in the workshop, the participants will collaborate on innovative ideas during this step. In case a user story has been evaluated, the participants can build and test it further, or participate in further discussions. In order to do so, the participants may be provided with the tools described in → *Chapter 4.1.5 Hybrid Workshop Format*. If, however, no user story was applicable, the participants may directly work with the topics and (research) questions as formerly introduced by the case studies. In both cases, the participants should find possibilities on how to close the RPAG, i. e. improve the communication between CPAs and (non-)citizens.

Pitch

A pitch is a presentation technique where longer, previous discussions are summarised and presented in a very short time, like 5 minutes, e. g. The sub-groups will find a person who will pitch their results back in the bigger round or plenum.

Feedback session and end

The ideas pitched will be feedbacked by other workshop participants, and the organisers and moderators. When more than one sub-group worked with the same user story, this will be a very interesting exchange on found ideas. The feedback should be given with an open mindset beyond rating the ideas as ‘right’ or ‘wrong’. The participant’s voices and opinions should be treated equally and neutrally. In the end, the moderators and/or organisers will sum up the workshop in its entirety, give thanks to the participants, and explain how the project will proceed from there. Information on the *continuation* should be given as well before the event is over.

Step	Action Item	✓
3.1	Letting the participants evaluate the user story assigned to the sub-group	
3.2	Fostering the discussion of the topic and/or (research) question on closing the RPAG	
3.3	Offering the right tools to enable the participants to develop innovative solutions	
3.4	Letting the participants decide on who will pitch the idea back in the plenum, and prepare to do so	
3.5	Merging all groups back together in the plenum	
3.6	Hearing every sub-group pitch their ideas to each other	
3.7	Fostering feedback to each pitch, both by the participants and the organisers/moderators	
3.8	Ending the workshop by thanking the participants and provide information on the continuation	

TABLE 10: ACTION ITEMS FOR THE COLLABORATION PHASE

4.3 Continuation

The continuation after workshops can be twofold. First, the *continuation* phase that is directly related to the practical workshop is explained. Afterwards, the continuation of the whole RiskPACC project is explained.

4.3.1 CONTINUATION PHASE FOR THE WORKSHOP

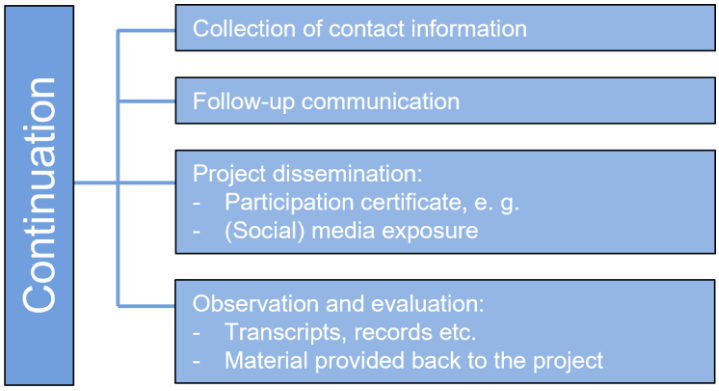

FIGURE 13: CONTINUATION PHASE

Overview

The last phase of the workshop is the *continuation* phase (Figure 13), in which contact information is collected to enable follow-up communication. The participants can, for example, receive a certificate of participation for the workshop and afterwards the workshop will be evaluated.

Collection of contact information

The GDPR consent form mentioned above is the pivotal point to look at to find out whether the participants allow the collection of contact information, i. e. their personal data. During the workshop preparations, the collection of personal data is necessary in order for the organisers to contact the participants and send out the invitations. At the end of the workshop, the organisers should ask the participants whether they are allowing their contact information to be kept, and to be contacted again. The organisers could let the participants fill out a designated list and should be transparent about how this information is stored. For example, the project partners agreed that such lists of participants will be kept within each institution, instead of being shared in the project consortium. Further information can be found in the GDPR information sheet and consent form in the → *Appendix*.

Follow-up communication and project dissemination

There should be a sort of follow-up communication/continuation in order for "the identification potential [to] be maximized, […] [leading] to a sense of responsibility for what has been created and its context, and [which] is accordingly relevant for the acceptance and stabilization of new solutions" (Dübner, Fanderl, & Heydkamp, 2018, p. 142). The workshops that are to be conducted on-site and within the case study regions, are also considered to be an ongoing activity (by the co-creational approach). Taken further, co-creation formats improve "identification with proposed projects being a valuable addition to existing participation methods by offering a different level of participatory intensity" (Dübner, & Heydkamp, 2019, p. 26). Partners might want to re-invite people who have already participated in a previous workshop. Another approach could be that former participants can forward new participants by word of mouth. In order to do so, ideas on how to shape the follow-up communication after the workshop have been collected within the project team.

The goal is to establish an ongoing engagement by the participants; in other fields also known as dissemination, or participant loyalty. This should add to the workshop's value and impact, because it will keep former participants invested in the project. It will help to make the project more visible and enhance public exposure and engagement. Engaging CPA representatives, as well as citizens in the workshops and the project, and thereby improving collaboration, is the bigger aim at hand. The ideas to shape the follow-up communication are the following.

- **Certificates of participation**. To enhance ongoing engagement with the project or a workshop cycle, participants could be handed out digital or tangible certificates of participation. Out of personal experience, we consider this to be a strong approach to foster the participants' investment in the project. Certificates of participation could be considered an approach to strengthen the project's ties with the participants, as well as keeping the project and its workshops in better memory. While the cost for distributing certificates of participation can both be manageable and yielded, the participants may become personally invested, which in turn could lead to an improvement of the project's impact and thus create immaterial value.

- **Online content creation**. In case on-site workshops are possible despite the pandemic situation, the workshop organisers could create online content that is intended to be distributed online, however values the participants' privacy. To give a few examples, pictures or videos could be taken of how the participants engage with the workshop material. Instead of showing the participants' faces, the focus can be set on the material on the tables or the presentation of results in the end. Depending on the style of the video, voices can be muted; the video can have a voice-over explaining the project or the workshop. These photos or videos can later be distributed via the project partners' social media accounts, or the project's YouTube channel that is planned within the dissemination done by Working Package 8. To share videos of workshops on YouTube is already planned in RiskPACC's Deliverable 8.1. Any content to be created during and distributed outside the workshops needs to aim for privacy by design and a declaration of informed consent to GDPR standards.

- **Report on previous workshops in the website calendar**. Similar to the distribution of future workshop dates on the project's website (s. a.), the integrated calendar can also show former workshops and report on their results or outputs. Working with short summaries, or again with photos or imbedded videos, reports on previous workshops can enhance the public's interest in future workshops. Additionally, participants of past workshops can share 'their' workshop via their own channels, such as sharing the link in their social groups or via social media.

As communicated within RiskPACC's Deliverable 8.1, the exploitation strategy aims for a "network of adopters and potential users consisting of a variety of different stakeholders" (Deliverable 8.1, p. 33). Ties to former workshop participants can form a pillar for sustainable relationships within this network. As mentioned before, the aim of any endeavour of follow-up communication is to improve the project's impact and immaterial value.

Observation and evaluation

In order for the RiskPACC project to succeed, the consortium will be in need of detailed insights into the workshops. There should both be information on the project's content, and which results or ideas have been found by the participants, e. g. On the other hand, an assessment on the workshop procedure should be given, for example, which methodology worked best and what procedure was effective. How the workshops are to be evaluated is further explained in → *Chapter 5.3: Next Steps*.

The documentation, however, is in the responsibility of the workshop organisers. Depending on the participants' consent given in the GDPR consent form, the workshops could be recorded, which will later help the case study partners to produce transcripts or other forms of records, such as summaries. In the scientific understanding, such transcripts or summaries are empirical, qualitative data. They are manufactured by transcribing the dialogues of the audio/video files, or by summarising the participants' findings. During the next project month, a guide on transcription will

be delivered internally to the project partners. The case study partners are also entrusted with the task of translating these transcripts or summaries back to English.

Following the pledges made in the RiskPACC GDPR statement, the data has to be factually pseudonymised. This means that in any form of documentation that is to be handed back to the project consortium, every piece of (personal) data that enables the (re-)identification of single workshop participants needs to be changed or blackened. Factual pseudonymisation also means that in case there needs to be information about the participatory groups' characteristics, (which is called a sample description,) the project consortium only is to be provided with aggregated data. The description of the participatory group, for example with categories such as gender, needs to be aggregated into a form where all pairs of characteristics must be represented more than once. If this cannot be given, categories need to be eliminated accordingly.

This material is provided back to the project consortium.

Step	Action Item	✓
4.1	Collecting contact information and backing the collection with consent given with the GDPR forms	
4.2	Choosing a form of follow-up communication and, where applies, providing the project partners with the content needed for the exposure	
4.3	Providing the workshop participants with certificates of participation	
4.4	Writing evaluations on the successes and/or issues with the workshop procedure	
4.5	Fabricating the documentation of the workshop by transcribing or summarising the recordings of the participants' input	
4.6	Factually pseudonymising the summaries by eliminating personal data from the contents	
4.7	Translating the summaries back to English	
4.8	Providing the project consortium with the evaluations, summaries, as well as aggregated sample descriptions	

TABLE 11: ACTION ITEMS FOR THE CONTINUATION PHASE

4.3.2 CONTINUATION FOR THE PROJECT

As explained in the introductory chapters of this deliverable, the RiskPACC project follows the co-creational approach (Figure 1) as a whole. To explain how the results are proceeded, the workshops are linked back to the bigger picture.

Concerning the development of the technological solutions, the workshops should help to investigate user and system requirements. Following the co-crational phases (Figure 1), the findings of the users' (workshop participants') interactions with the technological tools are handed back over to other WPs in the project; namely WP5 (Tool Development), and WP6 (Field Validation). Conceptual findings will be integrated in WP4 (Framework Development) and the workshop process is planned to become a part of the Risk Pack and RiskPACC online content in the responsibility of

WP7 (RiskPACC System architecture and technical integration; cf. Grant Agreement, 2021). Details need to be developed in the endeavours of these specific WPs. After refining (iteration) phases of the technological solutions, the workshop process is adapted to such developments as well, as intended in the frame of WP3 itself (Grant Agreement, 2021).

5 CONCLUSION AND OUTLOOK

5.1 Limitations

With the alignment of the co-creational process to collaborative governance, the possible impact of the workshops proposed needs to be evaluated. Following a democratic paradigm, the question arises what kind of change the co-creational approach can make in our society. Can the solutions derived from co-creational workshops close the gap between risk perception and action?

Considering the workshop to be held with approximately up to 20 people, this kind of self-government of people cannot aim at mass participation. Possibly characterised as a mini-public (cf. Lafont, 2015), the main criticism proposed is that any decision made will only account on the same micro-level, instead of a macro-level that would legitimise any democratic change made (ibid.). Even when the co-creational workshops improve the communication between CPAs and citizen initiatives, people who are left out of these mini-publics will be unrepresented. In turn, this poses a risk for citizen enstrangement, or (political) disenchantment (ibid.). As Lafont (2015) puts it, using mini-publics for actual decision-making in political environments is a shortcut not recommended. However, this problem may not be solved within the scope of this project, as it is a more substantial one. The real impact of the co-creational workshops will be empirically evaluated at a later stage within the project.

In a more practical sense, the RiskPACC project could face some limitations in its co-creational endeavours, because some of the co-creation workshops will be held digitally. As for example Ansell and Gash (2008) point out, “it is difficult to imagine effective collaboration without face-to-face dialogue” (p. 558). As better described in → *Chapter 4.1.4: Recruitment of Participants*, direct dialogue will build more trust among stakeholders and/or participants, which is a vital component for collaboration. Contrary, Frankowski (2019) found “that face-to-face meetings are not a necessary condition for shared motivation, willingness to participate and commitment” (p. 802).

5.2 Next Steps

The three main next steps within WP 3 on how to proceed with the co-creational workshop format are its 1) initialisation in the form of prototyping, 2) elimination of divergent approaches, and the 3) co-evaluation regarding legal and ethical issues. Apart from these objectives, the co-creational workshop will be 4) integrated in the “Risk Pack”.

1) The **initialisation of the workshop format** will take place during the following RiskPACC **Task 3.3** (Figure 14). In the following months, both project-internal as well as external workshops will take place. First, project-internal co-creation workshops may appear in the form of workshops between the project’s technological and case study partners, aiming at a matching between the technological solutions (and user stories), and the case studies. Yet the co-creational workshop can be used as a general approach for any project-internal workshop. Secondly, external workshops will be held within the case study areas and will serve as the test bed for the co-creational workshop approach to close the RPAG.

Moreover, the first insights on the workshops' results will be handed over to **WP 5**, where they will help the project's tool development, as well as **Task 4.3** for the joint work on RiskPACC's collaborative framework (Figure 14).

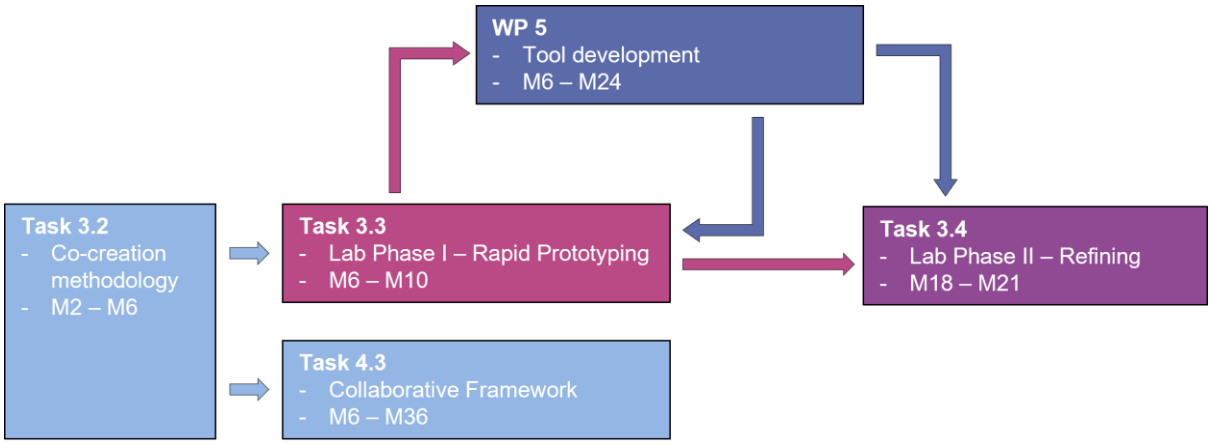

FIGURE 14: NEXT STEPS FOR THE CO-CREATION METHODOLOGY IN RISKPACC

2) In the frame of **Task 3.3**, **divergent approaches should be eliminated**. This will both apply to the workshop methodology, as well as the technological functionalities. First, the elimination of divergent approaches is necessary because the external, case study areas' workshops could be conducted in different ways, as they will first take place in parallel. The co-creation workshop with interchangeable modules offers agility. The workshop organisers are to choose which module and methodology fits best to their workshop, which means that the workshops conducted will be very diverse. The elimination of divergent approaches should gain insights on which approach works best, especially concerning the closure of the RPAG. Secondly, the results found in the workshops will eliminate technological functionalities that do not serve the purpose, which can also be decided in the frame of WP5.

The results will further be handed over to the later **Task 3.4** (Figure 14), where the co-creational workshop format will be updated to the highest possible degree of achievement.

3) In hindsight to **Task 3.5**, a **co-evaluation and impact assessment** will be conducted. In this deliverable, general hints are given how legal and ethical issues are already considered in the development stage. This will set the stage for the evaluation and transfers the notion that this workshop follows privacy, social, and ethical norms.

The workshop has been developed with inferences to broader political themes such as democracy and deliberation; collaborative, participative or collective governance; and representation. Collier & Esteban (1999) understand approaches in participative governance, that we align this workshop format to, as "not only effective in organisational terms; it is also ethical because it allows freedom and creativity to flourish" (p. 184). This approach has moreover been used to let this workshop follow the approaches of privacy- and data protection-by-design as well as gender

mainstreaming and inclusivity. Therefore, we anticipate that the workshop format proposed has a realistic chance to pass the requirements of the evaluation.

4) Finally, the co-creational workshop format will be **integrated in the "Risk Pack"**, which is handled by both WPs 7 and 8. In **Task 7.2**, the partners "will produce the RiskPACC platform integrating the co-creation methodology (WP3), repository, framework (both WP4) as well as tools (WP5) and documents (WP6)" (Grant Agreement, 2021). For the digital adaptation as well as the evaluation of the workshops, it could even be thinkable to take the Collaborative Governance Case Database (Utrecht University, 2020) as a role model. The Collaborative Governance Case Database has been developed in the EU-funded project SuccessfulGovernance (CORDIS, n. d.) and also provides evaluation sheets for collaborative governance formats.

Additionally, **Task 8.3** will produce the "physical version of the Risk Pack ("the Physical Box") including paper documents and the lab modules generated in WP3" (Grant Agreement, 2021). The workshop will be a part of the digital and physical Risk Pack in order for future case study areas and similar communities to conduct workshops independently. During the project lifetime, RiskPACC's project partner Efus is already collecting points of contact in European cities. The ideal prospect, however, is that the co-creational workshop format is a tool that will be a self-runner.

5.3 Milestone MS10

The present deliverable D3.4 is the result of RiskPACC's Task 3.2, "Co-Creation lab development, methodology, and implementation in the case-study-areas". Therefore, it is directly aligned to the project's milestone MS10 (MS3.3), "Introduction of the co-creation methodology in the case study areas". In order to reach the milestone, the methodology needed to be completed and introduced, and the case studies trained on use.

To train the case study owners on using the co-creation methodology, the contents of this deliverable and more have been presented to the whole project consortium. The topics presented included:

- background information about co-creation and its core values (→ *Chapter 2*)
- the co-creation workshop process and the practical guides provided (→ *Chapter 4*)
- the GDPR forms and User Stories (attached in the → *Appendix*)

Each project partner has been invited to participate in one of three 'Train the Moderator' meetings held on February 10th, 11th, and 14th. During these meetings, the project members received detailed information about the abovementioned contents and were able to ask specific questions in Q&A sessions.

Therefore, we consider MS10 to be reached and the task T3.2 concluded.

6 GLOSSARY

6.1 3-6-5 Method

The 3-6-5 method is a creative brainwriting method. In general, six people will each add three ideas to a topic or question in five minutes. First, an idea or question is presented and, if necessary, written down on a piece of paper. Secondly, each person will be able to gather thoughts to the question at hand and write down three own ideas or interpretation in the following five minutes. Next, each person will hand over their smaller piece of paper to the next person, who again takes the next five minutes to develop the previous ideas further. As soon as the piece of paper returns to the original owner, the round is complete, and the participants can share their results in the bigger group. (Lensch, n. d.)

6.2 Design Thinking

“Design thinking is generally defined as an analytical and creative process that enables a person in opportunities to experiment, create and prototype models, gather feedback, and redesign” (Razzouk & Shute, 2012, p. 330). Being highly practical, design thinking has close ties to experimentation, such as prototyping (ibid.), and is a “process for transforming difficult challenges into opportunities for design” (IDEO, 2012, p. 11). Design thinking processes include different methodologies which all bring together multiple perspectives and creative views, as they always involve a group of people (ibid.). The collaborative nature of design thinking enables a group of people to experiment in an environment that embodies an open mindset and a positive ‘error’ and feedback culture (ibid.). One general approach to design thinking processes is presented in Figure 15.

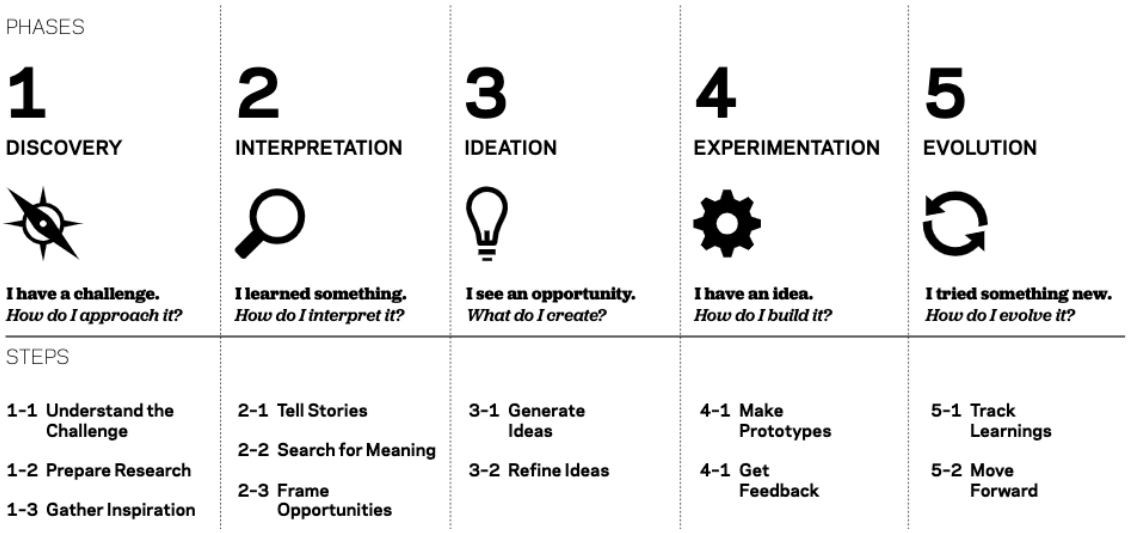

FIGURE 15: DESIGN PROCESS PHASES (IDEO, 2012, P. 15)

6.3 Fishbowl Method

The Fishbowl method is a method for group discussions. This method can best be done in physical environments. There, two circles of chairs are provided (Figure 16). While the outer circle will be the audience, the inner circle will consist of participants and a moderator who will lead the discussion. The inner circle will discuss about a predefined topic. One chair of the inner circle remains empty, as any person from the audience can join in whenever they feel like they want to contribute to the discussion. In order to do so, they can occupy the previously empty chair, or high-five a person from the inner circle and swap chairs. While the speakers in the inner circle should provide to a fair discussion, the moderator should keep the original topic in mind and guide through the discussion. (Siebert, 2010, p. 97)

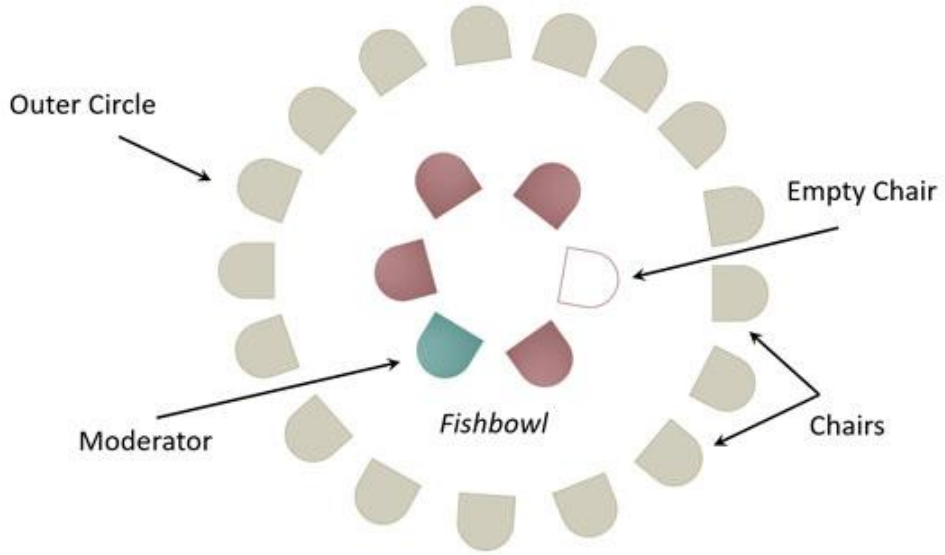

FIGURE 16: FISHBOWL METHOD[7]

6.4 Focus Group Interviews

Focus group interviews stem from the empirical and qualitative method of interviews. Practitioners are increasingly implementing empirical (focus group) interviews to their practices such as surveys, (marketing) research, or other data acquisition, because "the validity and generalizability" (Kontio et al., 2008, p. 93) of an empirically underpinned method improve a hands-on approach: "In summary, the focus group method is a cost-effective and quick empirical research approach for obtaining qualitative insights and feedback from practitioners. It can be used in several phases and types of research. […] We also emphasize the importance of empirical rigor when the method is used in scholarly work" (ibid., p. 93). In general, there are different types of questions that can be asked during an interview. However, open-ended questions,

[7] Picture source: https://www.skillsconverged.com/Portals/5/DownloadImages/FishbowlConversationTechnique.jpg

deviating from giving a short or a yes-or-no answer, work best (ibid., p. 94). Being defined as a “carefully planned discussion” (ibid., p. 94), the focus group interview should be prepared by (workshop) facilitators. The questions asked should be linked back to the key workshop or research question, while enabling the participants to share their thoughts in an open way.

Conducting a focus group interview instead of separated interviews with individuals also means giving room to discussions. The moderator should intervene when the discussion follows a too abstract direction or when the discussion between the participants is ebbing. “Ideally, participants become engaged, and the focus group becomes a forum for their own discussion. The moderator should begin to play a less central role as participants share experiences, debate ideas, and offer opinions” (Krueger et al., 2001, p. 5).

6.5 Get-to-know-you or Icebreaker Games

Get-to-know-you or icebreaker games should be used by workshop facilitators to give the participants the chance to interact. “Icebreakers are fun activities that help people get to know each other” (Dixon et al., 2006), being applicable both in real and virtual environments. “To assist in the building of social presence and minimize a sense of transactional distance, the use of icebreakers is recommended” (ibid.). The workshop facilitators should choose one or more icebreaker games before the workshop starts and present them to the participants. It is important to choose a game that enables both introverted and extroverted participants to speak up, while making sure not to ridicule any individual. As soon as the participants know each other better, better levels of communication and collaboration can be reached.

6.6 Makeathon

The term makeathon is made up of "make" and "marathon". A makeathon is a participatory format in which a group of people will work on products in diverse teams, following the pursuit of innovation. During the format, “the course of the Makeathons is divided into three phases: Idea generation, experimentation and prototype development. Each phase is preceded by a group-finding phase during which participants find a suiting team according to their interest. The integration of the results is ensured by the continuous dialogue between the working groups and the exchange between the assigned mentors” (Dübner, Fanderl, & Heydkamp, 2018, p. 143).

6.7 World Café Method

The World Café method is quite similar to the 3-6-5 method. However, instead of passing a piece of paper around, topics or questions are written on tablecloths of different tables (Figure 17). The participants will move from table to table to see what ideas have been found by others, and they will continue to develop the previously found ideas with their own remarks. In the end, all tablecloths can be presented like posters in the big group.

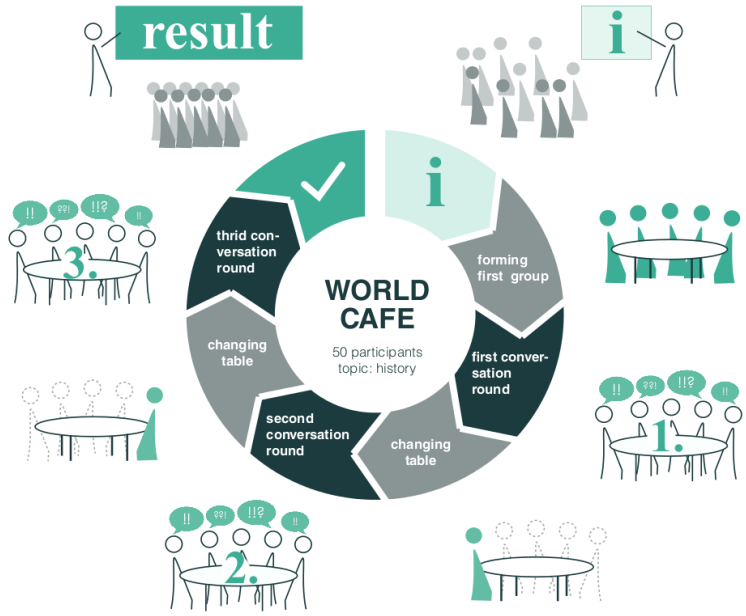

FIGURE 17: WORLD CAFÉ METHOD[8]

[8] Picture source: http://www.kulturhauptstadt2024.at/central/wp-content/uploads/2015/07/world-caf%C3%A9_hp.png

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8 ANNEXES

Annex No.	Description	No. of pages	Source
1	RiskPACC "Participation Information Sheet". Information sheet for participants of research and collaborative prospects, following the EU GDPR.	4	RiskPACC project consortium; WPs 1 and 2
2	RiskPACC "Statement of Informed Consent – RiskPACC Project". Form of consent for participants of research and collaborative prospects, following the EU GDPR.	3	RiskPACC project consortium; WPs 1 and 2
3	ICCS User Story – First Draft	3	ICCS
4	STAM User Story – First Draft	4	STAM
5	CS User Story – First Draft	6	CS
6	Contact Tracking App User Story – First Draft	3	USTUTT

TABLE 12: ANNEXES

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 101021271

The RiskPACC Consortium

FIGURE 18: THE RISKPACC CONSORTIUM

PARTICIPANT INFORMATION SHEET

RiskPACC: *Integrating Risk Perception and Action to enhance Civil protection-Citizen interaction*

You have been invited to take part in the RiskPACC project, funded by the European Commission and run by Dr. Maike Vollmer, Senior researcher at Fraunhofer Institute for Technological Trend Analysis (INT). You are free to withdraw your participation at any time, as it is voluntary. For your decision whether or not take part, you should understand the reasons why this research is being done and what will be involved. Please take time to read the following information carefully and feel free to ask questions.

1. THE PROJECT

RiskPACC focuses on increasing disaster resilience across society by closing the so-called Risk Perception Action Gap (RPAG) and aims to provide an understanding of disaster resilience from the perspective of citizens and Civil Protection Authorities (CPAs), identifying resilience building initiatives and good practices led by both citizens and CPAs. This research runs from September 2021 till August 2024. For more information the website www.riskpacc.eu is designed. The Consortium consists of 20 organisations from industry, academia and the public sector.

Partner	Country
FRAUNHOFER GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V. (FhG)	DE
TRILATERAL RESEARCH LTD	UK
INSTITUTE OF COMMUNICATION AND COMPUTER SYSTEMS (ICCS)	GR
THE UNIVERSITY OF WARWICK (UoW)	UK
KENTRO MELETON ASFALEIAS (KEMEA)	GR
EUROPEAN ORGANISATION FOR SECURITY (EOS)	BE
FORUM EUROPEEN POUR LA SECURITE URBAINE (Efus)	FR
CESKA ASOCIACE HASICSKYCH DUSTOJNIKU SDRUZENI (CAFO)	CZ
UNIVERSITY OF STUTTGART (USTUTT)	GER
SERVICE PUBLIC FEDERAL INTERIEUR (IBZ)	BE
UNIVERSITEIT TWENTE (UT)	NL
MUNICIPALITY OF EILAT (MoE)	IL
MAGEN DAVID ADOM IN ISRAEL (MDA)	IL
UNIVERSITY COLLEGE LONDON (UCL)	UK
CROWDSENSE BV (CS)	NL
STAM SRL (STAM)	IT
I.S.A.R. GERMANY STIFTUNG GGMBH (ISAR)	GER
THE CHIEF CONSTABLE OF LANCASHIRE CONSTABULARY (LC)	UK
DIMOS RAFINAS-PIKERMIOU (MRP)	GR
COMUNE DI PADOVA (CPD)	IT

This project has received funding from the European Union's Horizon 2020 innovation programme under the Grant Agreement No 101019707.

2. WHAT WILL THE RESEARCH INVOLVE?

RiskPACC includes different research and training activities in which you could participate, e.g. workshops, interviews, surveys, demonstration and exercises, together with consortium members or relevant stakeholders, like Civil Protection Authorities, Civil Society Organisations, NGOs, etc.

Interviews: Questions about your experiences in disaster response, related technologies and resilience and well as approaches to closing the RPAG will be discusses. The interview will take 30-90 minutes, and will be held via Teams or a similar video-conference software.

Workshops: Various stakeholders assembled to consider the practicalities of your work. We may shadow an individual or group, observe interactions, or gather information on user experiences. In addition, co-creation plays an important role in the project. This means that stakeholders will actively participate in selecting and developing solutions to close the RPAG.

Surveys: Questionnaires on specific issues in the risk cycle, resilience and vulnerabilities in Europe may be circulated.

Demonstrations: The tools involved in RiskPACC as well as well as the final platform and physical Risk Pack will be demonstrated to test and validate their way of working and impact. These demonstrations may include trainings, roleplays and evaluation activities.

You will be asked to provide the following information when taking part in any of these activities:

- Your name, professional affiliation, age range and contact information
- Your personal and professional views and experiences as they relate to the activities above
- Photographs, video and/or audio recordings of your participation in RiskPACC activities (e.g. documentation of discussions in workshops or activities in demonstrations).

3. WHY HAVE I BEEN CHOSEN?

You have been invited because of your experience and ability to articulate the needs of stakeholders in ways that can informed and be engaged with in complex and cross-disciplinary situations.

4. DO I HAVE TO TAKE PART?

No, your participation is completely voluntarily. You can leave at any time without giving a reason and without any consequences in the further participation in the project. You are free to refuse to answer any questions or provide any information. If you were invited to participate by your employer or university, be assured that you are under no undue pressure, advantage, or disadvantage to take part. You have the right to ask questions and receive understandable answers before making any decision.

5. WILL I BE RECORDED AND HOW WILL THE RECORDED MEDIA BE USED?

During the research, observer notes, audio and/or video recordings of your activities may be made. The information that you provide may be used to write articles for peer-reviewed journals and relevant industry magazines, for presentations at conferences and workshops, and in the promotion of RiskPACC in general. Additionally, your participation will be used to form our user requirements, revise system design, and develop the RiskPACC technologies with respect to responsible use. Without your written permission, no other use will be made. You can review any recording and notes upon request.

6. WHAT ARE THE POSSIBLE ADVANTAGES OF TAKING PART?

Whilst there are no immediate benefits, this work will contribute to future improvements in disaster resilience, reduction of the Risk Perception-Action Gap and decrease disaster risks. You will not be provided any incentive to participate.

7. WHAT ARE THE POSSIBLE DISADVANTAGES TAKING PART?

There is a small risk that you may share some confidential information by chance or that you may feel uncomfortable talking about some issues. You can inform us at any time, if you decide you do not want to have something you said or did used for RiskPACC research purposes. There is a small risk in terms of entrusting your personal data to the research team. To mitigate this risk, we have outlined strict privacy and data management procedures, in line with the applicable National and EU regulations, including the requirements of the Regulation EU 2016/679 (General Data Protection Regulation).

8. RIGHT TO WITHDRAW

You may withdraw your consent from this project at any time without giving a reason with just contacting the implementing researcher or project coordinator. You will be asked whether you would like us to delete your data or whether you are fine for these data to continue to be processed. You may be asked why you have decided to withdraw, but you are under no obligation to give a reason.

9. PRIVACY NOTICE

In this research project, your personal data will be processed as long as it is required, however, the data you provide will be anonymised to the extent possible. We will only collect and process data that is strictly necessary for running the research, for our internal processing, administrative purposes, and to enable us to contact you if we require further information. The record of your participation will be kept in a file separate from the research data. These data will not be shared with or disclosed to anyone outside the research team.

We will not share any information we collect about you unless we are required to do so with the European Commission as part of our obligations. However, the researcher has a duty of care to report to the relevant authorities possible harm/danger to the participant or others. If this was the case, we would inform you of any decisions that might limit your confidentiality. All information will be stored in a secure location on password protected computers and encrypted. They are only shared through a secure online platform managed by Fraunhofer INT. This information will be retained for the lifetime of the project. After the research ends, it will be either permanently and irrevocably deleted after a maximum of 12 months or archived for continued research in line with the EU General Data Protection Regulation and the other applicable national and supranational data protection laws.

10. DATA SUBJECT RIGHTS

If you are concerned or have questions about how your personal data is being processed, you have the right to contact both the consortia lead or the Legal, Ethical and Security Issues Manager. You also have the right to check what is collected and processed, to access to your data being processed, to delete or make any changes to this information, to restrict processing and to receive requested information in a time-limited fashion.

11. INCIDENTAL FINDINGS

There is a small risk that RiskPACC research reveals insights about individuals, groups and/or the collaboration between civil protection authorities, citizens and other stakeholders that have not been envisaged and that are adverse for one of the aforementioned groups and/or their collaboration. In case that any such findings should be made on the individual level, you will be informed personally via phone after careful considerations together with other researchers have concluded that informing you will be more beneficial than not informing you. In case such findings relate to the collaboration or a particular case study, the respective incidental findings contact person will be contacted.

12. CONTACT FOR QUESTIONS, CONCERNS, OR FURTHER INFORMATION

If you have any questions about this research or your prospective involvement in it, please contact:

Project Coordinator Dr. Maike Vollmer Email: maike.vollmer@int.fraunhofer.de Phone: +49 2251 18 393 Fraunhofer Institute for Technological Trend Analysis (INT), Appelsgarten 2, 53881 Euskirchen, GER
Legal, Ethical and Security Issues Manager Dr. Su Anson Email: Susan.Anson@trilateralresearch.com Trilateral Research Ltd., Crown House, 72 Hammersmith Road, London W14 8TH, UK

STATEMENT OF INFORMED CONSENT – RiskPACC Project

I volunteer to participate in this research conducted by the RiskPACC consortium, coordinated by Fraunhofer Institute for Technological Trend Analysis (INT). The consortium consists of 20 organisations. The project is funded by the European Commision under the Horizon 2020 funding programme, grant agreement number 101019707. The project began September 2021 and will end in August 2024.

By signing this form, you agree to take part in the RiskPACC research. The nature of the research, your involvement in it and your rights regarding your participation in the action are explained in the Information Sheet accompanying this form.

To agree with following statements, please put an ”X” in the boxes.

1. I confirm that I have read and understood both this form and the accompanying Information Sheet. I had the time and opportunity to ask questions as needed.	
2. I understand that personal data collected will be kept strictly confidential, minimised, and anonymised/pseudonimised to the greatest extent possible.	
3. I consent to the following information being included within RiskPACC research	
a. My full name	
b. Age range	
c. My organization	
d. My function	
e. Country represented	
4. I understand that I am free to withdraw my consent without negative consequence at any time without giving reason and that my participation in this project is voluntary.	
5. My personal data can be gathered to be used, stored and shared in the ways described on the accompanying Information Sheet.	
6. I understand that my participation raises some small risks in terms of entrusting my data to the research team.	
7. I consent to being photographed, video recorded, audio recorded, and having notes taken for:	
a. Ongoing RiskPACC research including developing technologies	
b. Dissemination activities (e.g. articles for peer-reviewed journals, presentations at conferences)	
c. Promotion of RiskPACC in general	
d. I agree to be quoted directly	

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8. RiskPACC may take research notes or recordings of my activities as I participate in the research.	
9. I understand that I have the right to ask questions and receive understandable answers before making any decision.	
10. I understand that I have the right to decline to answer any question or to terminate my involvement at any point.	
11. I understand that I will not be paid for my participation	
12. I consent that my personal data will be transferred to and stored in the EU/EEA. (Applicable for research subjects outside of the EU/EEA)	
13. I understand my right to request access to any, and all, personal information that I have voluntarily provided as part of my participation, and that I may ask for that information to be rectified and/or amended if it is inaccurate, or request that all personal information that I have provided be deleted.	
14. I have been given a copy of this consent form.	
15. I would like to receive regular updates on the progress and findings of the report	
16. I agree to voluntarily take part in the RiskPACC research.	

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Participant Consent

Name .....

Affiliation .....

Contact .....

Signature .....

Date ..... (Day/month/year)

Statement by the Researcher taking consent

I have accurately provided the information sheet to the participant and, to the best of my ability, made sure that the participant understands it. I confirm that the participant was given an opportunity to ask and get answers to questions about RiskPACC, the research activity he/she will be involved in. I confirm that the participant has given consent freely and voluntarily.

Name of Researcher _____

Signature of Researcher_____

Date _____ (Day/month/year)

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USER STORY ICCS

RiskPACC

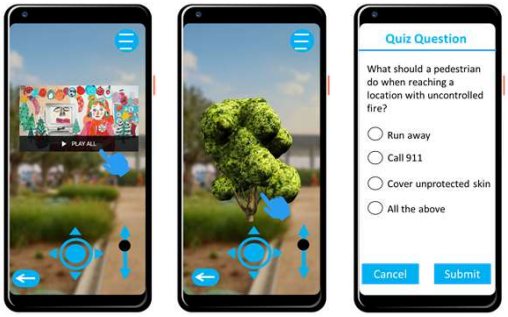
INITIAL SITUATION

In the outskirts of Athens, a hazardous situation involving floods/fires occurred.

The flood/fire caused significant damage in suburban and urban areas of Athens putting in danger critical assets and lives of citizens. Nobody was injured, because everyone was able to get to safety in time.

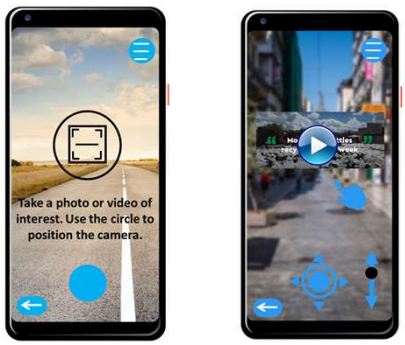
http://srbin.info/wp-content/uploads/2021/10/atina-poplava-700x467.png
https://www.theguardian.com/world/2021/aug/07/apocalyptic-scenes-hit-greece-as-wildfires-ravaged-by-fire

AR MOBILE APP FOR CLIMATE AND NATURAL HAZARD ASSESSMENT



Alexander, a local resident, tells that he downloaded the new AR mobile app for climate and natural hazard assessment a few weeks earlier and used the AR feature to conduct training for a disaster situation (flood/fire).

ALERT



With the new mobile AR app for climate and natural hazards assessment, the CPA was able to send an alert to all users to warn them of the flooding/fire hazard.

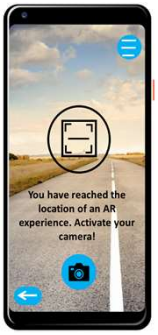
Some users who also noticed the flood/fire first uploaded pictures and communicated with each other to identify possible risk spots. In this way, Alexander was able to notice the flood/fire very early.

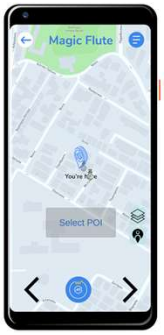
COMMUNICATION AND LOCALISATION

The Users can also communicate with the CPA and this made it possible to identify and report some dangerous locations. These locations can be seen on the map, together with the pictures and videos of the users.

Alexander quickly made his way to safety and warned his neighbours and friends.

ENDING





The CPA informed and guided Alexander and other users to safety points outside the danger zones where everyone who could get to safety collected and received support there, for example food or drink.

Alexander contacted the CPA to ask them to send a notification to everyone in the area to inform them about the conditions in safety collection point at this location.

USER STORY STAM

Crowdsourcing Tool

RiskPACC

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 101019707

RiskPACC

INITIAL SITUATION

Today Paolo wants to go to the park with his grandchildren and buy some ice-creams. However, since its has been recently undergone heart surgery.

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INITIAL SITUATION

He decides to check on the **crowd sourcing tool** how is the situation in its city.

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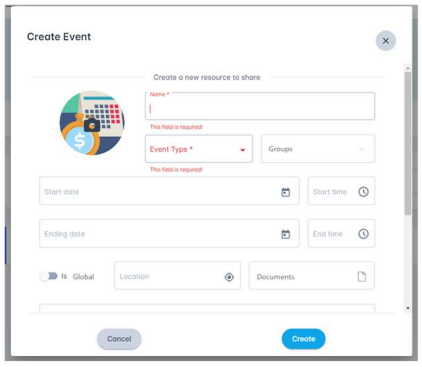
SHORTLY BEFORE…



In the morning of the same day Marco, who works for a local CPA, has received a warning for risk of elevated heat. So he has immediately created a post on **crowd sourcing tool** to alert the population at risk. While creating the post, he indicated the duration of the alert, the geographic area, the groups of citizens that must receive this alert and other information indicative for citizens.

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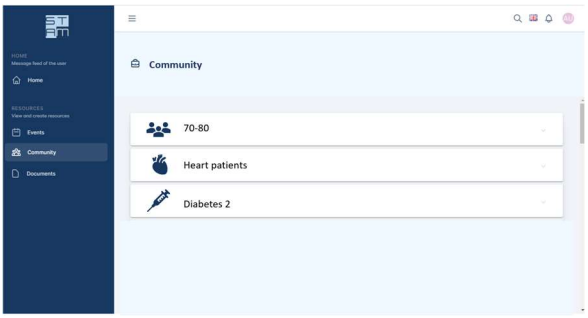
ALERT



Paolo upon logging on the website immediately receive a notification of an alert. He received the alert because he is located in the area of where the heat stroke is expected to happen and he is in the groups target when created the event.

Paolo has been categorised under the group of "70-80" and "heart patients" when he updated his health information during the registration phase.

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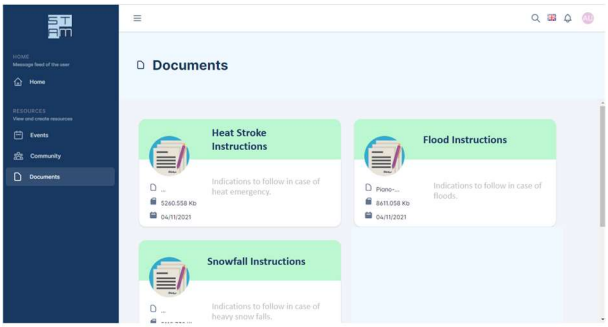
DOCUMENTATION



On the alert event created, there is also the link to the document created by the CPA with the instruction to follow in case of an heat stroke.

Paolo carefully reads the instructions in order to know how he should behave in the current situation.

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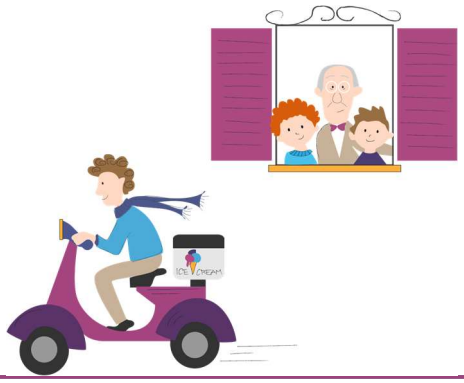
HAPPY-ENDING



After reading the instructions Paolo chose that it is better for him to stay at home. Therefore, he decides to order the ice-cream for his grandchildren at home.

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PublicSonar / CrowdSense
User Story 1: Natural disaster management

RiskPACC

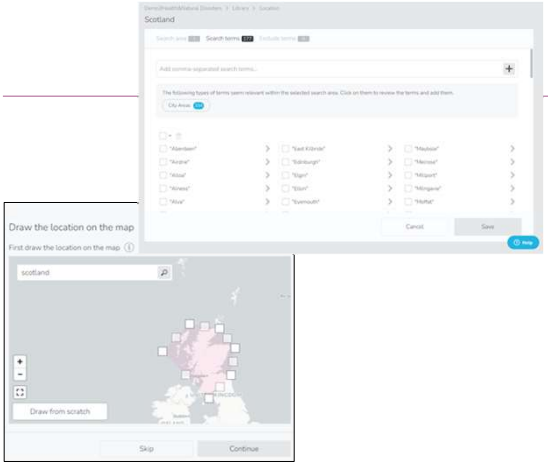
CONTEXT
Storm Arwen (Nov 2021)

The storm Arwen is forecasted to hit Scotland and northern Europe in the coming days.

As a regional emergency center operator, I aim for creating situation awareness and detecting early warnings for issues related to Natural Disasters.

- I would like to understand how the population is reacting and preparing for the storm;
- During the incident, I would like monitor the situation in real time and understand potential impact on critical infrastructure and local population;
- I would like to monitor the post-incident management of the situation;

GEO-LOCATION & TOPIC MONITORING

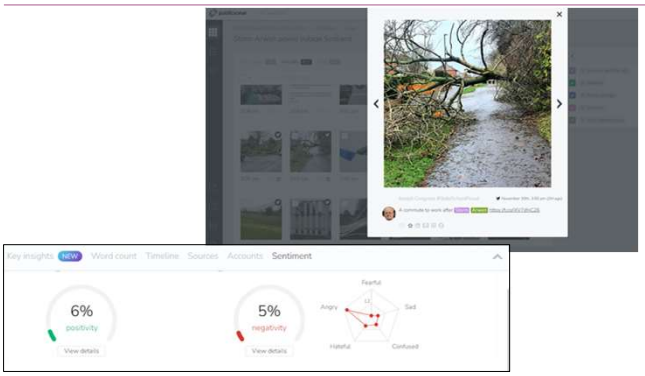


As an experienced operator, I know that key signals can be extracted from publicly available information. I also know that it is important to cut through noise, so informed decision can be taken quicker.

Therefore, ahead of time, I setup monitoring of social media information around my area (Scotland) and my topics of interest (infrastructure damage, power outage & mobility issues).

I am now ready to analyze the situation and act.

POPULATION SENTIMENT & FIRST SIGNALS



As the storm arrives:

- I can easily monitor what the population sentiment is and how it evolves;
- I monitor real time information on geographic basis;
- Thanks to the automatic analysis of pictures and text, I start collecting the first signals of damage;

INCIDENT MANAGEMENT

During the incident, as the situation evolves:

- I can monitor the impact on different areas;
- I keep the rest of my team and other emergency services on top of important information through a dedicated dashboard;
- I forward important insights to a dedicated response team, so swift actions can be taken

PublicSonar / CrowdSense
User Story 2: Public Safety

RiskPACC

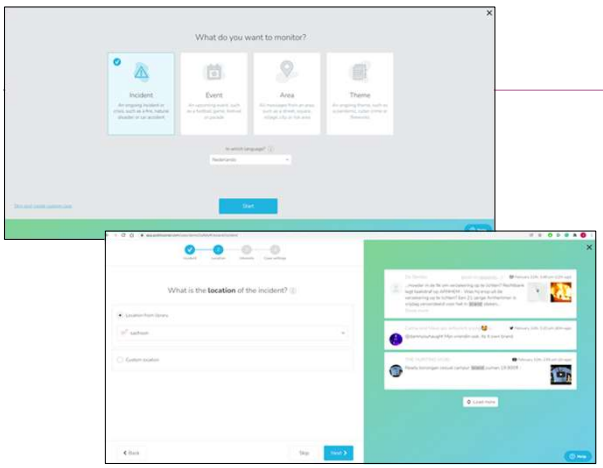
CONTEXT
Shooting Heidelberg University (Jan 2022)

I am a police officer in Germany monitoring for civil unrest and public safety.

On Jan 25, my team became aware of a shooting incident at the university of Heidelber, Germany. Very little information is known and the attack is still ongoing.

I decide to check if some important information can be found online.

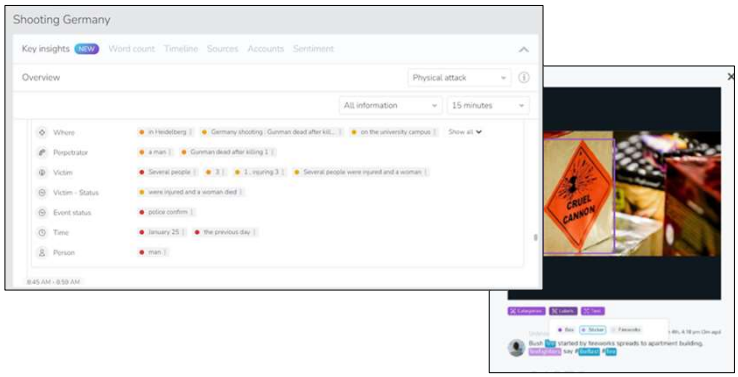
INFORMATION COLLECTION



Using the wizard, I quickly build a custom case for collecting publicly available information from different sources including social media (such as Twitter) but also semi-private sources such as forums, Telegram and other local sources.

I am interested in new information (real-time) but also any prior insights (historical data) which may have indicated a potential attack.

INFORMATION ANALYSIS



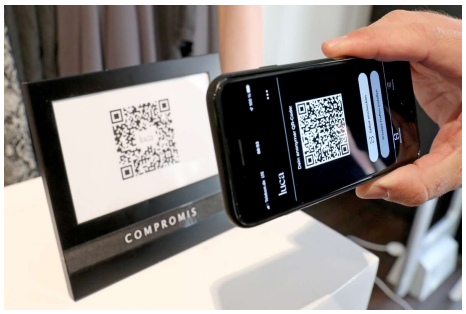
More and more people become aware of the situation so the quantity of messages posted online grows exponentially. Therefore, I rely on automated image and message analysis to extract new insights (e.g. casualties, event/perpetrator description).

POST-MORTEM

After the incident, an analysis of the whole incident needs to be performed. For that, I consolidate all the information collected over the past days and create a quick automated report for my management. The report includes consolidated information including most active accounts, important messages, visuals and other data collected.

USER STORY: CONTACT TRACKING APPS

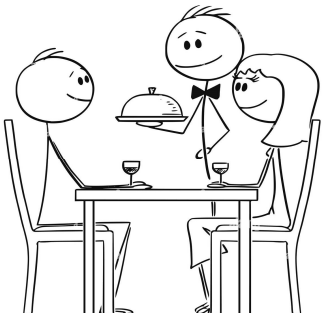
LUCA APP



https://bit.ly/3rlICK0

Sara is on her way to the restaurant to have dinner with a friend. Since she had downloaded the Luca app in beforehand, she could easily check in to share her contact details in case someone in the restaurant was subsequently found to be infected with Covid-19.

COV-PASS APP



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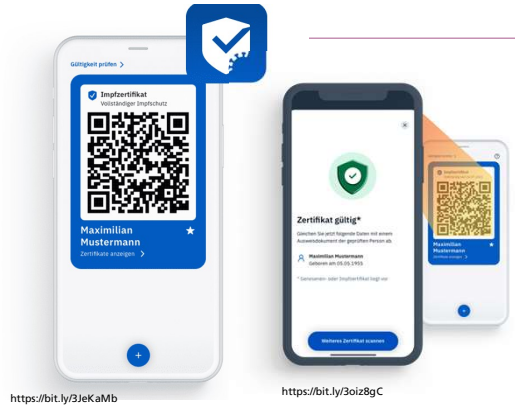
In the restaurant, the waiter asks about her vaccination status and Sara shows the Cov-Pass-APP. Since vaccination or proof of recovery is a prerequisite for being able to eat in the restaurant.

COV-PASS-CHECK-APP



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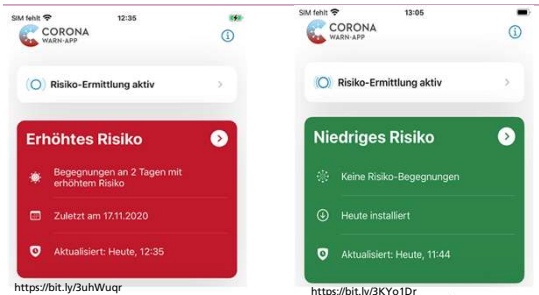
The waiter scans the QR code with the Cov-Pass-Check-App, on which the vaccination certificate is being checked. Since everything is fine, both can eat in the restaurant.

CORONA WARNING APP



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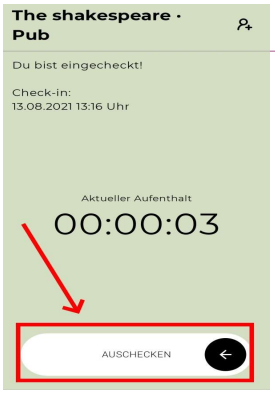
https://bit.ly/3KYo1Dr

During her visit at the restaurant, Sara checks on the CoronaWarn app to see if everything is fine or if there is an increased risk of infection. For the contact tracing, the device sends out rolling proximity IDs on a regular time frame and is searching with Bluetooth low energy for other IDs at the same time. The app shows green and everything is fine, if the app display turned red, there would be an increased risk of infection.

LUCA APP



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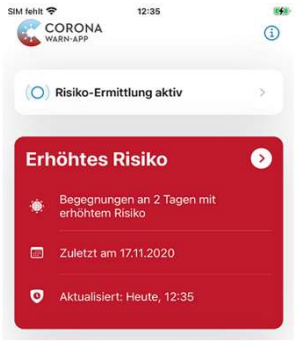
https://bit.ly/3ulwXgj

When leaving the restaurant, Sara checks out with the Luca-APP, which requires her to swipe to the right on the display. The Luca app also shows how long she has been in the restaurant.

END



https://bit.ly/3uhWuqr

After a few hours, however, the CoronaWarn app indicated that she had been exposed to an increased risk. Sara then went into self-isolation, so others could be protected.