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for Emergency and Crisis Management**

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Deliverable D7.1.1 Risk Management Plan

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Dissemination level		
PU	Public	✓
PP	Restricted to other program participants (including Commission Services)	
RE	Restricted to a group specified by the consortium (including Commission Services)	
CO	Confidential, only for members of the consortium (including Commission Services)	

Executive Summary

Dissemination Plan

This document presents deliverable D7.1.1 (Risk Management Plan) of project FP7-614154 | CNPq-490084/2013-3 (RESCUER), a Collaborative Project supported by the European Commission and MCTI/CNPq (Brazil). Full information on this project is available online at <http://www.rescuer-project.org>.

Deliverable D7.1.1 provides the results of Task 7.1 (Scientific Coordination) that are concerned with the identification, assessment, monitoring, and controlling of project risks as well as with the identification of relevant legal regulations and ethical that might constraint the development or the future operation of the RESCUER platform.

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1. Introduction

1.1. Purpose

The RESCUER project aims at developing a smart and interoperable computer-based solution for supporting emergency and crisis management, with a special focus on incidents in industrial areas and on large-scale events. Both the concept and the objectives of the RESCUER project are described in the DoW [1], which is part of the EC Grant Agreement (Annex I).

The purpose of this document (D7.1.1: Risk Management Plan) is to support the early identification and handling of issues that might hinder the RESCUER consortia in realizing the project concept or achieving the project objectives. These hindering issues constitute risks to the success of the project and therefore measures must be taken in order to reduce the probability of their occurrence and/or their impact. As legal regulations and ethical issues play a relevant role in the context of a crowdsourcing based emergency and crisis management solution, the RESCUER consortia decided to look at them as risk categories.

This risk management plan is meant to be a living document and it should be updated whenever a project member identifies a new risk, legal regulation, or ethical issues concerning the project. In addition, it should be updated regularly during the whole project duration, but at least once in each reporting period.

1.2. Partners' Roles and Contributions

Fraunhofer and UFBA are responsible for the scientific coordination of the RESCUER project (Task 7.1), which includes risk management. Fraunhofer was in charge of writing this document. The other project partners are expected to contribute to it on a regular basis, not only through the identification of additional risks, legal regulations, and ethical issues, but also by providing their viewpoint on the current assessment of the project risks. UFBA is in charge of keeping this document up-to-date with Fraunhofer's support.

1.3. Document Overview

The remainder of this document is structured as follows.

- Chapter 2 describes the approach for risk management adopted in the RESCUER project.
- Chapter 3 contains the currently identified projects risks, their assessment, and the actions to be taken to mitigate and/or reduce the impact of the set of relevant risks.
- Chapter 4 provides the mechanisms for monitoring and controlling the set of relevant risks.
- Chapter 5 presents the relevant legal regulations concerning emergency and crisis management systems.



- Chapter 6 keeps track of any ethical issue arising during the project's lifetime or already identified at the time of project proposal.
- Chapter 7 presents the conclusion of this document.

2. Risk Management Process

This section explains the risk management activities to be carried out in the RESCUER project. They are organised in three sub-processes: Risk Assessment, Action Planning, and Risk Monitoring and Controlling, and follow the best practices compiled by the software engineering community [2,3]. This section is also structured according to the three sub-processes.

2.1. Risk Assessment

The goal of this sub-process is to identify and analyse the project risks in order to allow their prioritization and, in particular, to allow the distinction between risks for which an action plan needs to be elaborated and risks whose probability and impact do not justify the elaboration of an action plan. The activities of this sub-process are:

- Identify Risks:** Identify issues that might hinder the RESCUER consortia in realizing the project concept or achieving the project objectives, affecting the project timeline, budget or the quality of deliverables.
- Analyse Risks:** Classify the identified risks according to the proposed risk categories and estimate their probability and impact.
- Prioritize Risks:** Assign priorities to the identified risks according to their probability and impact and determine a cut point that indicates the risks for which action plans should be elaborated. These risks are the most relevant risks in the project context. In the RESCUER project, the risk priority is based on the risk exposure, which is calculated according to the formula: risk probability multiplied by risk impact. Table 1 shows how this should be done.

Table 1: Risk exposure

Impact → Probability ↓	Low (1)	Medium (2)	High (3)
Low (1)	Low (1)	Low (2)	Medium (3)
Medium (2)	Low (2)	Medium (4)	High (6)
High (3)	Medium (3)	High (6)	High (9)

2.2. Action Planning

The goal of this sub-process is to decide how to deal with the risks that were considered most relevant to the project context and to plan the actions that are necessary to reduce their probability or impact. The activities of this sub-process are:

- Decide Answer:** Decide how to answer to each of the most relevant risks. The answer can be: avoid risk (e.g. by changing the characteristics of the RESCUER platform), transfer risk (e.g. by subcontracting), control risk (by elaborating an action plan to reduce its probability and/or impact), or accept risk (by acknowledging the risk, but not planning any action to address it). It might not be possible to avoid or transfer a risk.
- Plan Actions:** Elaborate action plans for the mitigation of the most relevant risks or for the contingency of their impact. Action plans for related risks can be grouped.
- Obtain Commitment:** Obtain commitment from the project members in charge of carrying out actions that have been planned to mitigate risks or reduce their impact. If necessary, commitment from the site leaders of the respective project consortium and from the other Consortium Coordinator should be obtained.

2.3. Risk Monitoring and Controlling

The goal of this sub-process is to regularly monitor the status of the most relevant risks and the results of the action plans. The activities of this sub-process are:

- Monitor Risks:** Monitor the evolution of the probability and impact of the most relevant risks and check the effectiveness of the action plans already executed. This activity might trigger other action plans, identify new risks, register risks as obsolete, or change the answers to risks.
- Communicate Risks:** Communicate the status of the most relevant risks, the results of the action plans already executed, and the action plans recently triggered to the site leaders of the respective project consortium and to the other consortium coordinator. This should take place at the consortium meetings and, if necessary, in shorter intervals.
- Execute Plan:** Execute action plans for risk mitigation or contingency.

3. Risk Management Plan

In the DoW [1], some preliminary risks that might occur in the context of the RESCUER project were already identified, and possible actions to avoid them or mitigate their impact were formulated. This section updates the contents of the DoW regarding risk management after performing the activities described in the previous chapter.

Table 2 to 4 (all columns but the latter) provides the results of the Risk Assessment sub-process, whereas the last column of those tables and Table 5 provide the results of the Action Planning sub-process. As not too many risks have been identified, all identified risks have been considered as relevant.

Table 2: Risk assessment for the risks to the implementation of the project concept

ID	Description	Timeslot	Consequence	Probability	Impact	Exposure	Answer
R1	Not enough information is gathered through Mobile Crowdsourcing	Whole project duration and also during the operation of the Rescuer Platform after project end	<ul style="list-style-type: none"> • Difficulty in testing the adequacy of the multimedia data analysis solutions • Degradation of the services provided by the RESCUER platform (e.g. consolidated information intended to support situation awareness would only be based on simple data that can be collected without people's intervention) 	Low (1)	Medium (2)	Low (2)	Control risk , despite of related projects having already showed that people are willing to provide information about emergencies.
R2	Mobile applications cannot be implemented on every desired platform	Whole project duration	Less people in the crowd would be able to send information about an incident through the Mobile Crowdsourcing Solution	Low (1)	Medium (2)	Low (2)	Control risk
R3	Not enough people is willing to participate in the evaluations	Whole project duration	The results of the evaluations might not reflect the real quality properties and consequent benefits and drawbacks of the RESCUER platform	Low (1)	Medium (2)	Low (2)	Control risk

Table 3: Risk assessment for the risks to project management

ID	Description	Timeslot	Consequence	Probability	Impact	Exposure	Answer
R4	Diverging technical objectives	Whole project duration	Different partners' contributions would not fit together and thus the RESCUER concept would not be successfully realized.	Medium (2)	High (3)	High (6)	Control risk
R5	The project results only fit to the project partners' products	Whole project duration	The RESCUER platform would be not generic enough in order to be used in other contexts.	Medium (2)	High (3)	High (6)	Control risk
R6	One of the partners leaves one of the consortia or goes into bankruptcy	Whole project duration	<ul style="list-style-type: none"> All contributions to be made by this partner would be missing in the RESCUER deliverables The RESCUER concept might not be successfully realized 	Low (1)	Medium (2)	Low (2)	Accept risk. If this risk really occurs, new partners might be added to the affected consortium. In addition, there are some synergies of competences between project partners to foster cooperation. As a last resource, they can be used to reduce the risk impact.
R7	Delay in technical developments	Whole project duration	Delay in the overall project, which might make it impossible to realize the project concept within the project duration.	Medium (2)	High (3)	High (6)	Control risk
R8	New activities of major relevance for the project are identified	Whole project duration	<ul style="list-style-type: none"> Delay in the overall project Less manpower would be available for carrying out the planned tasks and activities 	Medium (2)	High (3)	High (6)	Control risk

Table 4: Risk assessment for the risks to citizens and society

ID	Description	Timeslot	Consequence	Probability	Impact	Exposure	Answer
R9	False prioritization of actions by eyewitnesses and first responders	During the operation of the Rescuer Platform after project end	People could get injured by prioritizing the report of the information using the RESCUER Platform instead of their safety or the safety of other people.	Low (1)	High (3)	Medium (3)	Accept risk. Survival instinct should avoid this risk to really occur. Nevertheless, first responders follow rigorous training, which will include the required conditions for using the RESCUER mobile applications to report an emergency. The answer to this risk might change for the second iteration, which is concerned with follow-up interaction, in order to ensure that no contact with people still exposed to risks will be initiated.
R10	False scenario description	During the operation of the Rescuer Platform after project end	The command and control centre might make the wrong decision.	Medium (2)	High (3)	High (6)	Control risk

Table 5: Mitigation and contingency plan

ID	Risks	Actions	Trigger Condition	Responsible WP/ Task / Role	Start Date	End Date
M1	R1	<p>A1 Ask whether the project partners that are user organizations have images and videos from previous training exercises</p> <p>A2 Ask the project partners that are user organizations to record images and videos from the emergency situation simulated in the training exercises from now on</p> <p>A3 Look in the Internet for databank of emergency situations images and/or videos</p> <p>A4 Use synthetic models or surveillance data</p>	<p>A3 if A1 and A2 are not effective.</p> <p>A4 at the beginning of the project when A1 to A3 are not effective.</p>	WP3 (UPM and USP)	31. Jan 2014	31. Jul 2014
M2	R2	<p>A1 Early prototyping should investigate the feasibility of implementing the RESCUER mobile applications on different platforms and the required changes for supporting each platform. Platforms with a disadvantageous relationship between effort and number of users might be excluded early in the project</p> <p>A2 RESCUER's Portability and Variation Management Strategy (D1.4.x) will propose a solution for efficiently covering as many platforms as possible</p>	Start date	Task 2.5 for A1 and Task 1.4 for A2. MTM is the partner that is mainly in charge of these actions.	31. Jan 2014	31. Jul 2014
M3	R3	<p>A1 Start arrangements for performing evaluations in the selected application scenarios at the very beginning of the project, in order to ensure appropriate incentives for people to participate in the evaluations</p> <p>A2 Lack of people can be compensated by recruiting students of the associated universities</p>	<p>Start date for A1.</p> <p>A2 when A1 is not effective.</p>	Task 5.1 (USP and UPM)	31. Jan 2014	31. Jul 2014

Table 5: Mitigation and contingency plan (cont.)

ID	Risks	Actions	Trigger Condition	Responsible WP/ Task / Role	Start Date	End Date
M4	R4	<p>A1 Organisation of consortium meetings and overall project meetings to ensure good communication and harmonization channels among partners</p> <p>A2 Periodic meeting of consortium coordinators to discuss project issues</p> <p>A3 Use of conflict resolution strategy defined in the DoW [1] to deal with divergences and conflicts</p>	<p>Start date for A1 and A2.</p> <p>A3 when someone detects diverging technical objectives.</p> <p>Every project member is responsible for communicating diverging technical objectives as soon as he/she realises it.</p>	Task 7.1 (Fraunhofer and UFBA)	01. Oct 2013	31. Mar 2016
M5	R5	<p>A1 Continuous consideration of trends and products that exist outside the project consortia</p> <p>A2 Explicit check for this risk when performing internal review of deliverables</p> <p>A3 Feedback from the Industry & Public Authority Panel (see section 2.1 of the DoW [1]) during the consortium and/or projects meetings</p>		All partners for A1 and A2. Task 7.1 (Fraunhofer and UFBA) for A3.	01. Oct 2013	31. Mar 2016
M6	R7, R8	<p>A1 Project Progress Reporting Meeting for early detection of new activities and delays</p> <p>A2 Reallocation of manpower among project partners and tasks</p>	<p>Start date for A1.</p> <p>A2 when the risk occurs.</p>	Work package leaders and consortium coordinators for A1. Consortium coordinators and consortium boards for A2.	01. Oct 2013	31. Mar 2016
M7	R10	<p>A1 Association of a reliability level to all information made available in the Emergency Response Toolkit, so that the command and control centre's member can double-check it, as they would do with any information coming from the outside.</p> <p>A2 Evaluation of the Emergency Response Toolkit in close to real scenarios (e.g. simulation) at the end of the project. Extensive evaluation is out of the project scope, which will cover a limited numbers of evaluations.</p>	<p>Start date for A1.</p> <p>A2 close from the middle of the project on.</p>	WP1 for A1 (UFBA and Vomatec). WP5 (USP and UPM) for A2.	01. Oct 2013	31. Mar 2016

4. Risk Monitoring and Controlling Report

Inclusion of new risks, change in the exposure to a specific risk or change in the answer to it should be registered in tables 2 to 4 directly. Old versions of this document will be kept in a version management system for the case it becomes necessary to analyse how risk exposure evolved over time. Risks that become obsolete should be kept in the tables, but indicated as being obsolete by changing the font colour to grey.

Risks that occur during the project duration should be recorded in Table 6. The status of mitigation and contingency plans should be registered in Table 7, where the possible values for status are triggered or concluded, whereas the possible values for effectiveness are effective or not effective.

Table 6: Occurred risks

Risk	Date	Cause	Consequence
R7	31. Jan 2014	Delay in the provision of funding to the Brazilian partners.	<ul style="list-style-type: none"> Deliverables have been sent in a draft version to the EC (without the Brazilian perspective) Delay in all tasks starting in the first four project months and dependent tasks

Table 7: Status of the mitigation and contingency plans

Plan	Status	Result	Effectiveness
M4	Triggered (A1 and A2)		
M5	Triggered (A1 and A2)		
M6	Triggered (A1 and A2)		A1 should take place in shorter intervals
M7	Triggered (A1)		
M8	Triggered (A1 and A2)		

5. Legal Regulations

Several regulations should be considered when developing the RESCUER platform (Table 8). In Europe, there are few regulations concerning emergency and crisis management that are proposed by the European Commission (EC); most regulations are country specific. In any case, the EC recommends the countries to revise the few proposed regulations and develop their own regulations [4]. Table 8 is expected to be extended along the project duration.

Table 8: Relevant Regulations for the RESCUER Project

ID	Regulation	Country
RG1	Agreement between the State Oberösterreich (Capital Linz and Steyregg Municipality) and the Companies in the Chemical Park of Linz about the Cooperation in Emergency Situations [5]	Austria
RG2	National Crisis and Catastrophe Management Guidelines (SKKM Richtlinie) [6]	Austria
RG3	Large-scale Events Law [7]	Austria
RG4	Organic Law 15/1999 on the Protection of Personal Data [8]	Spain
RG5	Royal Decree 1720/2007, which approves the regulation implementing Organic Law 15/1999 [9]	Spain
RG6	Royal Decree 3/2010, which regulates the National Security Framework within the e-government scope [10]	Spain
RG7	Law 2/2011 on Sustainable Economy. Modification of Organic Law 15/1999 [11]	Spain

Some initial regulation aspects are also discussed in the remainder of this chapter.

L1. Accountability

After an emergency situation is handled there may be several official investigations in order to assess its trigger, the reasons that made the situation achieve its worse state, the responsible persons, among others. Moreover, the decisions made and procedures adopted to handle the emergency situation will be studied to assess whether they were the right ones. This implies that all data used to support decisions should be logged and cannot be deleted.

L2. Data Usage Control

During emergency handling, several private data might be recorded in the RESCUER platform, such person location and name, and physical and psychological injuries. This is private data that should be controlled in order to be only used by authorized people.

L3. Intellectual Property Rights

As the RESCUER platform deals with multimedia data captured by the crowd, e.g. images or videos, intellectual property rights must be considered in addition to the privacy issues. For example, images and videos should not be distributed to the press without respecting intellectual property rights and privacy.

Table 9 presents the action plans for dealing with the identified legal regulations. Those action plans will be monitored and controlled together with the action plans for avoiding and minimising the impact of risks (Table 7).

6. Ethical Issues

The Ethical Advisory Board (introduced in section 2.1 of the DoW [1]) should keep this chapter updated. The following ethical issues have been identified so far.

E1. Involvement of adult healthy volunteers

Eyewitnesses of incidents will provide information about the incident and the current emergency situation using their mobile devices. In addition, the command and control centre may contact eyewitnesses through their mobile devices for getting missing but relevant information about the situation or for giving instructions on how to proceed. The collected data (e.g. photos provided by eyewitnesses that may include people) will be stored to allow data analysis.

E2. Tracking of people location

RESCUER will implicitly gather contextual information (e.g. location or temperature) from sensors in the mobile devices.

Table 9 presents the action plans for dealing with ethical issues. Those action plans will be monitored and controlled together with the action plans for avoiding and minimising the impact of risks (Table 7).

Table 9: Action plans concerning regulations and ethical issues

ID	Ethical Issues	Actions	Trigger Condition	Responsible WP/ Task / Role	Start Date	End Date
M8	L1-3, E1,E2	<p>A1 Derive requirements for the RESCUER platform from the seven principles of the OECD's recommendations, the European Commission's Directive 95/46/EC, and the RESCUER project guidelines provided in section 4.1 of the DoW [1]</p> <p>A2 Derive procedures for the evaluations of the RESCUER results from the seven principles of the OECD's recommendations, the European Commission's Directive 95/46/EC, and the RESCUER project guidelines provided in section 4.1 of the DoW [1]</p>	Start Date	<p>WP1 (UFBA and Vomatec) for A1.</p> <p>WP5 (USP and UPM) for A2.</p>	31. Jan 2014	31. Aug 2015

7. Conclusion

This document is expected to keep track of the list of issues that might hinder the RESCUER consortia in achieving the project objectives, which includes risks to the implementation of the project concept, risks to project management, risks to citizens and society, legal regulations, and ethical issues. This document also supports risk monitoring and control, where legal regulations and ethical issues are expected to be monitored and controlled through the definition of action plans as it is done for any other risk. With this purpose, the risk management process to be followed in the RESCUER project is described and the respective resulting artefacts (e.g. Risk Management Plan and Risk Monitoring and Controlling Report) are provided as part of this document. As those artefacts need continuous updating, this document is a living document.

Bibliography

- [1] EC Grant Agreement No 614154 (2013). Annex 1: Description of Work.
- [2] ISO/IEC 12207: Systems and software engineering – Software life cycle process (2008). International Organization for Standardization and International Electro-technical Commission, Geneva.
- [3] CMMI for Development (2002). Version 1.3, Software Engineering Institute, Carnegie Mellon University, Pittsburgh.
- [4] Siegfried Jachs (2011). Einführung in das Katastrophenmanagement. tredition-Verlag.
- [5] Vereinbarung zwischen Land Oberösterreich – Landeshauptstadt Linz – Stadtgemeinde Steyregg und den Unternehmen am Chemiepark Linz über die Zusammenarbeit bei Schadensereignissen (2014). 48p.
- [6] Staatliches Krisen und Katastrophenmanagement (SKKM Richtlinie), Austria.
http://www.bmi.gv.at/cms/BMI_Zivilschutz/mehr_zum_thema/SKKM.aspx
- [7] Veranstaltungsgesetz, Austria. <https://www.ris.bka.gv.at/> (search for "VeranstaltungsG" and the specific state)
- [8] Ley Orgánica 15/1999 del 13 de Diciembre de Protección de Datos (LOPD). Consolidated text on 5th March 2011.
<http://www.agpd.es/portalwebAGPD/canaldocumentacion/legislacion/estatal/index-ides-idphp.php>
- [9] Royal Decree 1720/2007 of 21st December. Approval of the Regulation Implementing LOPD.
<http://www.agpd.es/portalwebAGPD/canaldocumentacion/legislacion/estatal/index-ides-idphp.php>
- [10] Royal Decree 3/2010 of 8th January. Regulation of the National Security Framework within the e-government Scope.
<http://www.agpd.es/portalwebAGPD/canaldocumentacion/legislacion/estatal/index-ides-idphp.php>
- [11] Law 2/2011 of 4th March on Sustainable Economy. Modification of LOPD.
<http://www.agpd.es/portalwebAGPD/canaldocumentacion/legislacion/estatal/index-ides-idphp.php>

Glossary

Terms

Command and Control Centre Group of people assigned to evaluate risks and make decisions in an emergency and/or crisis in an industrial area or at a large-scale event.

Emergency Response Toolkit Component of the RESCUER platform that is intended to support command and control centres and operational forces in performing their emergency and crisis management activities

Ethical Advisory Board Group that consist of at least one person from each country participating in the RESCUER consortia and, if possible, it should include at least one representative of the end user partners. It is in charge of monitoring potential ethical issues concerning privacy and informed consent throughout the project's duration and to align the direction of the research if necessary.

Eyewitnesses People in the place of the incident that caused the critical situation.

Industry & Public Authority Panel Group that congregate companies and public authorities in Brazil or in Europe that are not part of the consortia, but that are interested in the vision and in the results of the RESCUER project.

Abbreviations

EC European Commission

EU European Union

DoW Description of Work

OECD Organisation for Economic Co-operation and Development

RESCUER Reliable and Smart Crowdsourcing Solution for Emergency and Crisis Management