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Risk Mitigation in Project Management: Case Horizon 2020

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MASTER'S THESIS
May 2019

Master's degree in Business Administration
International Business Management

ABSTRACT

This research studies risks, risk identification and risk mitigation methods in project management. Specifically, the study seeks to investigate the risk mitigation in European Commission funded Horizon 2020 project management.

In order to identify the substantial risks in Horizon 2020 project management, this research first overviews literature on risks and risk management in general and introduces the methods used in risk management activities. The aim is to get an overall view of possible risk areas, risk management processes and risk mitigation actions. The definition of a Horizon 2020 project is also presented.

The objective of the research is to identify possible risks related to management activities in Horizon 2020 projects and suggestions for risk mitigation actions. Risk identification is carried out by face-to-face interviews and with a web survey. The outcome of this research is a Risk register that presents all identified risks related to Horizon 2020 project management. Risk register can be used as a risk management tool for future projects.

CONTENTS

ABBREVIATIONS AND TERMS

DoA	Description of Action (Horizon 2020 project plan)
EC	European Commission
EU	European Union
CA	Consortium Agreement
GA	Grant Agreement
GDPR	General Data Protection Regulation
H2020	Horizon 2020 framework programme
IPR	Intellectual Property Rights
ITN	Innovative Training Networks
WP	Work Package

1 INTRODUCTION

This chapter explains the background information of the topic of the thesis. The objectives, research questions and the structure of this research is also presented shortly in this chapter.

1.1 Background

European Commission's eighth framework programme, Horizon 2020 (H2020), has proceeded over halfway of its seven-year duration. The first Horizon 2020 projects started in the beginning of the year 2014. The last ones will start during the year 2020. Horizon 2020 is the biggest European Commission funded Research and Innovation framework programme, with nearly €80 billion in funding. (What is Horizon? n.d.) The goal of the European Union (EU) is to drive economic growth and create jobs in Europe by strengthening the EU's scientific expertise through Horizon 2020, supporting the development and deployment of new technologies and innovations, and finding solutions to major societal challenges in Europe. (Horisontti 2020 n.d.). Additionally, the goal of Horizon 2020 is to ensure that Europe produces excellent science, remove barriers to innovation, and make it easier for the public and private sectors to work together in delivering innovations. (What is Horizon? n.d.) European Commission have signed 13903 project grants during the years 2015-2016. This massive number of projects have been distributed to organizations in 28 different countries. (Horizon 2020 in full swing 2017, 7, 13.) How many more projects will appear, will be verified after the framework programme ends.

The outline for the next, ninth framework programme for the years 2021-2027 has already been established under the name Horizon Europe. European Commission proposes a budget for it that is larger than any other framework programme before (Horizon Europe 2018, 1).

Horizon 2020 projects have same features as many other projects. A project is a unique entity, consisting of interrelated and temporary activities that have predefined goals and that must be completed in a specific time slot, within budget, and according to specifications. (Artto, Martinsuo & Kujala 2011, 17.) In addition, Horizon 2020 project management consists of similar pillars as project management in general. Project managers must strive to meet specific scope, time, cost and quality goals of projects, but also facilitate the entire process to meet the needs and expectations of the people involved in or affected by project activities (Schwalbe 2009, 7- 11; Artto et al. 2011, 24 - 27). However, there are hardly any projects where everything is happening according to the plan, no matter how well you are prepared for all the possible situations and risks. Especially in the case of large Horizon 2020 research and innovation projects, where average duration of the projects is between 2-3 years and the number of partner organizations in project consortium could be between 15 and 20 from different European countries, there is a high possibility that something will go wrong during the implementation phase. Horizon 2020 project implementation is about going beyond the state-of-the-art and therefore there is always risk that all your objectives are not achievable, which you may find out too late. In order to ensure uninterrupted progress and successful implementation of the project, risk identification and needed remedy actions should be performed constantly. (How to plan and manage risks on Horizon 2020 projects, 2015.)

Risk management is one of the important processes of project management. Risk management is a continuous process and it refers to managed activities that identifies and evaluates potential project risks with different kind of methods. Project risk management planning and executing activities refer to using forward thinking to plan for possible risks and to identify and implement actions that can control impact of the unfavorable risks. The purpose of managing risk management activity is to ensure that all the tasks respond to actual risk occurrences, is implemented at the right time, in the right areas, and in appropriate manner. (Artto et al. 2011, 27, 153, 159, 161, 171).

There is especially a need for deeper knowledge concerning the risk mitigation among Horizon 2020 project management, in order to implement sustainable and high-quality project management. Risk mitigation, also known as *risk control*, is

about reducing probability and/or impact through active measures (Kerzner 2017, 620).

The focus of this research is only in risk mitigation actions that are related to the Horizon 2020 project management. The aim is to find what kind of risks project management itself keeps inside, what are the impacts if risks in project management get real and how to mitigate them.

The study is done in cooperation with Research services at the former Tampere University of Technology, which merged into Tampere University in the beginning of the year 2019. The outcome of the study will act as a risk management tool for project managers, principal investigators, grant writers and to Horizon 2020 project administrators.

1.2   Objectives and research questions

The main aim of this thesis is to study risk and risk mitigation actions in project management. Specifically, the study seeks to investigate the risk mitigation in project management of European Commission funded Horizon 2020 projects.

In order to identify the substantial risks in project management, literature is first overviewed on risks and risk management in general and methods used in risk management activities. The aim is to get an overall view of the possible risk types, risk management processes and risk mitigation actions. For Horizon 2020 project management risks a study is carried out using interviews and questionnaires. The outcome of this thesis is a Risk register that presents all identified risks related to Horizon 2020 project management.

Risk register is a document that contains all the project management risks identified in the beginning of and during the project lifetime. Risk register includes also grading in terms of likelihood of occurrence and seriousness of impact. Mitigation and possible recovery actions will be also presented in the risk register. (Anderson 2014, 5; Schwalbe 2009, 181.) This research will not only present examples on what kind of impact realized risks have had for the project implementation but will also give estimations how discovered but not realized risk could have affected

achieving the project goals. By identifying the risks, this study will provide mitigation actions to help prevent the recognized risks.

Briefly, the aim of this study can be summarized through the following main research questions:

- What are the risks involved in Horizon 2020 project management?
- What kind of impact have discovered risks had in Horizon 2020 project management?
- How can risks be mitigated in Horizon 2020 project management?

1.3   Structure of the thesis

This thesis contains seven chapters: Introduction, Research Methodology, Risk Management, Horizon 2020 project, Result and Risk register, Discussion and Summary.

Chapter 1 consist of introduction of research background, research objectives and structure of the thesis. The three research questions are also presented in chapter 1. Chapter 2 presents the used methodology that is followed throughout the research process. Theoretical background and relevant literature are introduced in chapter 3. After that, chapter 4 introduces the case, Horizon 2020. The applied part of this thesis consist of chapter 5 where the executed interviews are presented together with the list of discovered risks. The main results are discussed and analysed in in chapter 6 together with the final conclusions.

The questions used in the study for the interviews and in the web survey can be found in Appendix 1. The main outcome of this research, Risk register, is presented in Appendix 2. The following Figure 1 presents the structure of the thesis.

Chapter 1 Background, objectives and structure

Chapter 3

Theoretical framework

- What is a risk?
- Risk management
- Risk management process

Chapter 4

H2020 case introduction

- What is Horizon 2020?
- Project actors
- Management in H2020
- Current level of H2020 management risks

Chapter 2

Methodology

Chapter 5

Results of the questionnaire

- Web survey
- Face-to-face interview
- Risk register

Chapter 6 Discussion and Chapter 7 Summary

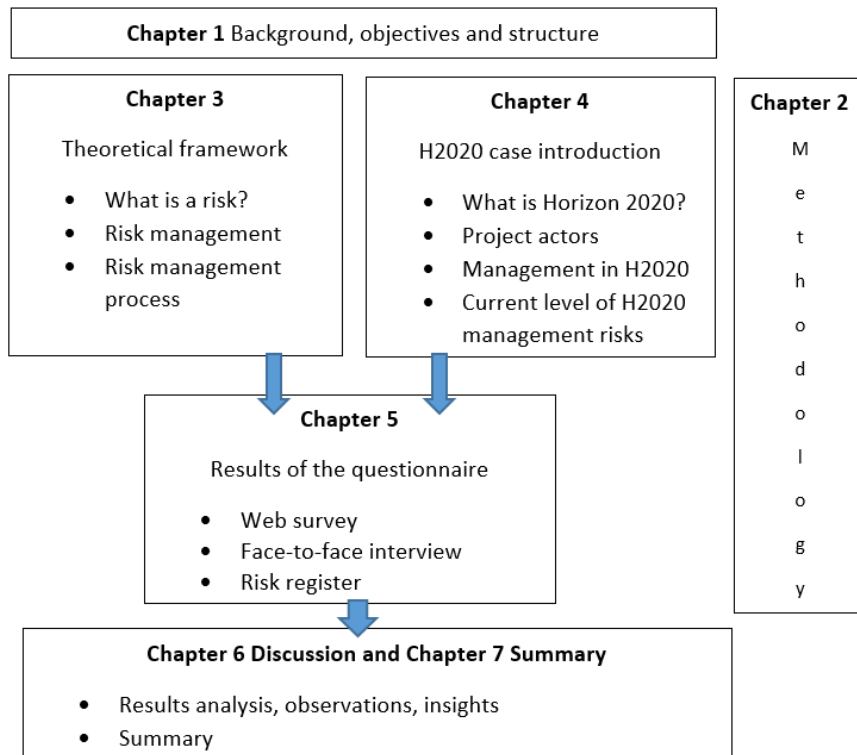- Results analysis, observations, insights
- Summary

FIGURE 1. Structure of the thesis

2   RESEARCH METHODOLOGY

This research is based on three parts, which will be compared and combined, to receive the most comprehensive research results.

First, this research is based on the theoretical studies about risks, risk management and risk management processes. The literature used in this study is obtained from libraries, internet and electronic databases. Different types of sources (books, scientific and other articles, web pages, videos, social media publications and theses from different learning areas) have influenced the results of this study.

Second, the research will be based on the introduction of Horizon 2020 project. Horizon 2020 project lifecycle will be presented briefly in order to give an overview what kind of actions are affecting the discovered risks. Horizon 2020 management tasks are presented in a list. The list includes tasks that are carried out mainly by a project coordinator, but also by the beneficiaries and other project stakeholders. Thereafter a summary of already discovered H2020 management risks is presented. The summary consist of several Horizon 2020 project risk management plans from where all identified management risks have been collected.

Third, current status of risks in Horizon 2020 project management will be identified by implementing a survey to selected key persons with different connections to fields of Horizon 2020 project management.

The aim of this research is also to find empirical data of risk behavior in Horizon 2020 project management. In order to answer the research questions, both quantitative and qualitative approaches are used.

Quantitative research uses surveys and experiments to collect the statistical research data. A survey is an important way of collecting and reviewing information. A survey can be face-to-face interview or a questionnaire made electronically

online or on paper. (Vehkalahti 2014, 11-13.) Qualitative research typically provides insights on several aspects and seeks to find open and individual answers (Aaltola &Valli 2010b, 70-73).

A general statement is that quantitative research seeks to find general understanding and qualitative research is more of finding details. (Vehkalahti 2014, 13.) This research uses both quantitative and qualitative methods. Data collection method is quantitative but the open questions in survey and interviews seeks qualitative responses.

Both face-to-face interviews and online survey research was chosen for the main data collecting method of this thesis. Interviews are formulated as semi-structured interviews where all questions are prewritten but interviewee have the freedom to give individual answers (Hirsjärvi & Hurme 2011, 43-48). It is meaningful to use structured interview method in order to get equivalent results which can be analysed as one entity and combined into Risk register. Therefore, the analysis can be done comprehensively from all the research material.

Questionnaires are one of the most traditional ways of collecting research material. The challenge in a survey is to form the questions right. (Aaltola & Valli 2010a, 103-104). The web survey form used as part of this study is presented in Appendix 1. The results of the web surveys and face-to-face interviews are presented in chapter 5. The results and the Risk register, produced an outcome of the results which are analysed in chapter 6 Discussion. Questions in the questionnaire consider the interviewees' own experiences from the identified and encountered Horizon 2020 project management risks, impacts on the project, likelihood analysis and implemented remedy actions for the recognized risks. The survey gives also an opportunity to the respondents to present "other risks" which have not been disclosed in the currently identified risk list. The purpose of this questionnaire is to discover risks related to the management of Horizon 2020 projects. The aim is also to discover already used remedy actions and find new mitigation methods. The research results of this thesis will provide a comprehensive list of all the detected risk, a Risk register, in Horizon 2020 projects management, its impacts, and present suggestions for mitigation actions to prevent the risks.

3   RISK MANAGEMENT

3.1   What is a risk

"Risk is a measure of the probability and consequence of not achieving a defined project goal." (Kerzner 2017, 601).

Usually risks refer to have a negative effect. This is because a risk is uncertain and has unexpected nature. It is critical to find and understand different risk causes and consequences beforehand. By understanding, risk features the right management decisions can be selected. (Anderson 2014, 3.) According to Mäntyneva (2016) risks have many definitions depending on the context or the type of the risk. Depending on the risk, impacts and consequences can also be very different.

Typical risk areas in a project are

- schedules
- unclear roles and responsibilities
- financing
- use of key resources
- technology
- deliverable quality
- organization commitment to project preparation, planning and implementation
- unclear goals. (Mäntyneva 2016, 133 – 135.)

In addition to Mäntyneva's list of the typical risk areas in a project, Artto et al. (2011) has summarized that the most substantial risk sources in a project are:

- customer, user, financer
- supplier, subcontractor
- new technical, functional, or methodical solutions
- decision-making speed and content of decisions (in a company related to the project), and the degree of management support and amount of resources provided to the project

- communication, transfer of information, availability of information
- changes to project plans
- human factors, such as excessive optimism in preparing estimates, lack of information and knowledge, or change resistance due to other factors
- coordinating problems due to the dependencies among activities or complex dependencies among parts of the project. (Artto et al. 2011, 160 – 161.)

Anderson (2014) and Artto et al. (2011) conclude that risk can also be grouped as external risks or internal risks. External risk are something that are not in the hands of the project manager. External risk could be for example exchange rates or government regulations. Internal risk are such as employee availability, supply and operation issues. (Anderson 2014, 3; Artto et al. 2011, 160 – 161.)

3.2 Risk management

"Proper risk management is proactive rather than reactive and positive rather than negative and seeks to increase the probability of project success" (Kerzner 2017, 604).

Risk management is the process of identifying and controlling risks. Project risk management refers to identify potential risk in advance, analysing them and make needed mitigation actions. Both Artto et al. (2011) and Kerzner (2017) conclude that risk management process consists the following activities:

1. Risk identifying
2. Risk evaluating
3. Planning and executing responses. (Artto et al. 2011, 166 – 181; Kerzner 2017, 599 – 600.)

In addition, Artto et al. (2011, 159) states that managing risk management activities is the fourth activity of the risk management process. This will be presented in this thesis in chapter 3.4 Project risk management process.

Project uniqueness always presents a challenge in risk management. Project risks increase with the degree of project innovativeness or newness; therefore, new, highly innovative projects require special efforts collaboration in carrying out risk management (Artto et al. 2011, 160).

3.3   Risk management plan and risk register

Proper project plan includes a plan for risk management and mitigation actions. Risk management plan is a support document for the project coordinator or project manager. An exemplary risk management plan includes information such as project methodology, roles and responsibilities, budget and schedule estimation for risk activities, risk categories, risk communication and consequences. Its purpose is to foresee risks, estimate impacts and define remedy actions. (Schwalbe, 2009, 177-181.)

Risk management plan should be updated continuously, because new risks can appear any time during the project (Artto et al. 2011, 171; Mäntyneva 2016, 138-139).

Risk register is a narrower document than risk management plan. It is often handled as part of the risk management plan. Risk register is a document that contains all the details of the risks identified at the beginning and during the project lifetime. Risk register is often displayed in a table or spreadsheet format. It is a tool for documenting potential risk event, their grading in terms of likelihood of occurring and magnitude of their impact. Mitigation actions are also usually listed in the risk register. (Schwalbe 2009, 180-181.)

Risk register can include headlines such as:

- Identification number for each identified risk
- Name of the risk
- Description of the risk
- Reason why risk occurs
- Triggers, that may cause the risk to be realised

- An assessment of the likelihood and impact, if the risk will occur. The project team needs to determine these assessment rankings.

- Impact on project
- Potential mitigation actions to each identified risk
- Person, who will take responsibility for the risk event
- Status of the risk event (Schwalbe 2009, 181-183).

TABLE 1. Example of a risk register table structure

Id	Date	Name and the description of the risk	Impact on project	Assessment of likelihood	Assessment of impact	Score	Mitigation actions	Responsibility for mitigation action(s)	Status/results
Number	Date of identification	Descriptive name and identify relevant triggers that may cause the risk to be realized.	Describe the nature of the risk and the impact on the project if the risk is not mitigated or managed.	1-5 where 1 is lowest and 5 highest	1-5 where 1 is lowest and 5 highest	Likelihood x Impact	Specify planned mitigation strategies.	Coordinator, beneficiary, project manager	Specify, if the risk event occurred/was the response strategy completed/is the risk still relevant or what was the result.

Babtista et al. (2015) presents as a part of the risk prevention methodology a "Consortium barometer" that they developed. It is a similar risk listing method, than risk register. Consortium barometer is a self-assessment tool for managing the consortia. It includes twelve identified factors, which have a major impact on the success or failure of a project. By asking the project partners to classify how well they think the consortium is performing against each of these factors, it is possible to highlight the underlying causes of problems, or to identify activities that may raise to problems in the future. Differences, which raise up in the ratings given by different partners will also help to identify situations that might cause fundamentally conflicts in the consortium. In the example Babtista et al. presents that the identified conflicts were mitigated by giving support in collaboration with the WP-leader to reach the technical deadlines and organising physical and virtual meetings were used as remedy action. In this barometer strong rated factors should be cherished, medium evaluated factors need attention and low rated factors presents threats to the viability of the consortium and should be addressed a matter of urgency. The barometer should be submitted by each partner organization in the consortium. (Babtista, Charrua-Santos & Pascoa 2015.)

3.4   Project risk management process

According to Artto et al. (2011) risk management consist of four activities; identifying risks, evaluating risks, planning and executing responses and managing all risk management activities. The purpose of risk identifying is to have an overall understanding about the risks that can affect the project. Evaluation defines the magnitude of the risks and their possible effect on the project and its results. The planning and executing activities refer to using forward thinking to plan for possible risks and to identify and implement actions that can control effect of the unfavorable risks. The purpose of managing risk management activity is to ensure that all the tasks respond to actual risk occurrences, are implemented at the right time, in the right areas, and in appropriate manner. (Artto et al. 2011, 159.)
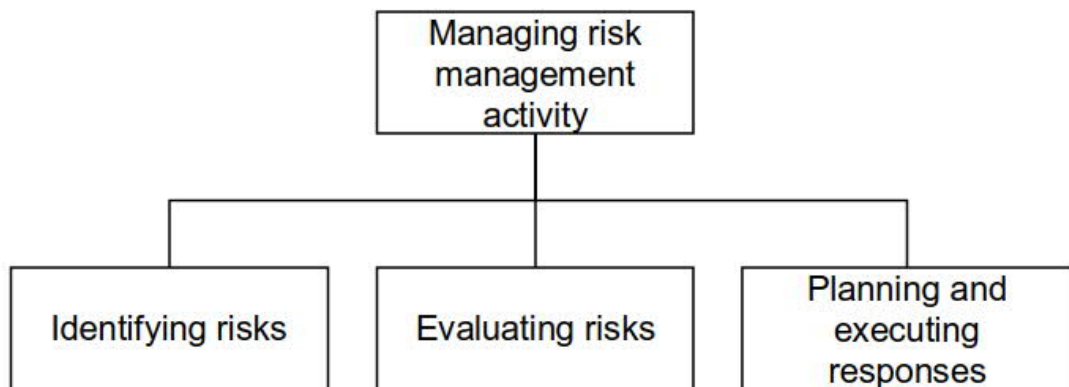
FIGURE 2. Four activities of risk management (Artto et al. 2011, 159).

Kerzner (2017, 600) defines that project risk management consists of identifying potential risks, formal planning activity, analysis to estimate the probability and predict the impact on the project of identified risks, a risk response strategy for selected risks, and the ability to monitor and control the process in reducing these selected risks to the desired level. The both presented risk management processes are very similar. Different is how the needed tasks are grouped. Different is that Artto et al. (2011, 159) points out that managing risk management activities is one of the main phases of the process and Kerzner (2017, 610) emphasizes risk control, which is also known as risk mitigation. Mitigation is defined as one of the risk response option, which mission is to reduce probability and/or impact through active measures. (Kerzner, 2017, 622.)

3.4.1 Identifying risks

The overall purpose of risk identification is to search, define and document discovered risks. Once risks are recognized, their nature and magnitude can be communicated with systematic methods over the various stages of a single project. And from project to another. (Artto et al. 2011, 159.)

Project plans and estimates are always based on assumptions. The assumptions can be clearly expressed and known by everyone, or each project member can have their own understanding about the situation. It is useful to discuss and identify such assumptions, to ensure that everyone recognizes their relevance to risks. (Artto et al. 2011, 160.) The project team together with the project manager usually performs risk identification. One key person (such as project manager) can also identify risks but is extremely useful to utilize the experience of wide range of personnel to ensure that risks are comprehensively identified. Together with the project manager, other specialist such as designers, engineers, lawyers, financial personnel and managers responsible for sales or logistics, can perform risk identification. (Lööw 2002, 59, according to Männistö 2005, 21; Chapman & Ward 2004a, 129-130, according to Männistö 2005, 21.)

3.4.2 Methods to identify risks

Risks can be identified with help of various tools and methods. Procedures that will help to discover and rank risks are checklists, creative ideation, modelling and research (Artto et al. 2011, 161). Other possible risk identifications methods can be such as testing, evaluation of other projects and implementing different kind of interviews. It depends on the nature of the project which of the methods is most suitable to identify that specific project's risks. It can also be a combination of several identification methods. (Männistö 2005, 21-23.)

The first method to identify risks is a checklist. A checklist can be developed based on past project experience. It is wise to use and learn from the historical information of an organization and projects, and based on this learning, to increase the risk consciousness of company personnel for future projects. (Artto et al. 2011, 161.)

> In its simplest form, a checklist contains a list of risks or themes. In its broadest form, a checklist can be a database in which risk and risk-related learning from prior projects have been recorded. Such databases may include ready-made estimates of the magnitude of risk, suggestion for actions that may lessen possibilities of an actual risk materializing, and actions that may mitigate the effects when actual risk occurs. (Artto et al. 2011, 161.)

According to Mäntyneva (2016) even the projects differ from each other, checklists to identify risks can be formulated around the most substantial risk sources, such as; schedules, unclear roles and responsibilities, financing, use of key resources, technology, deliverable quality, organization commitment to project preparation, planning and implementation and unclear goals.

A risk identification checklist can include also questions like:
- what are the uncertainties associated in the project?
- what could go wrong and what would be the consequences?
- what will happen if the project does not achieve its goals?
- how have recognized risks been documented?
- how will possible risks be discovered and noticed during the project lifetime?
- how will all significant risks be informed to all project stakeholders?
- how will all the mitigation actions be documented? (Mäntyneva 2016, 134.)

The project risks are identified when going through the checklist and question. Lists can be recorded in a project-specific risk list that is updated in later stages of the project. (Artto et al. 2011, 161.)

Second, support procedure for identifying risks is creative ideation. Brainstorming is a team-based risk identification method. During brainstorming, discussion is kept as open as possible and criticism is not allowed. The goal is to gather as many ideas as possible which may activate the ideas of others. Once risks are identified, possible risks are discussed and the worthiest ones are reserved for further analysis. Different backgrounds of the participants improve the results of

risk identification. (Artto et al. 2011, 161; Wideman 1992, C-1, according to Männistö 2005.)

Third, modeling refers to analysing and classifying project risks or describing the relationship between the risks so that the entire risk situation, formed by various risks, can be presented comprehensive. Modeling can include a visual presentation of the risk. (Artto et al. 2011, 162.)

Fourth, risks can be identified and evaluated through research or studies that require familiarizing oneself with material, including the project, concerning technology that is applied in the project. There are several methods for collecting information, including performing technical calculations, modelling and calculating project risks, and conducting interviews. (Artto et al. 2011, 162.)

In addition, a risk identification tool can be also such as expert opinion (BS IEC 62198:2001 according to Männistö 2005, 23). In assessing risks, risk-oriented interviews of different stakeholders can be helpful to identify potential risks not identified during normal activities. Use of external consultants may be justified, particularly in matters requiring special technical expertise or concerning the conditions of the country in which the project is executed. (Artto et al. 2011, 162.)

3.4.3 Evaluating risks

In the risk management process, risk identification is followed by risk evaluating. The overall purpose of evaluating risks is to estimate and evaluate the identified risks in order to select mitigation actions, and whether some remedy actions are needed.

According to Anderson (2014, 6) and Mäntyneva (2016, 136) a risk register will contain several different risks and it is important to focus on the most important ones. By evaluating the identified risks, shows the most critical risk. The most critical risks are those that are relatively likely to occur and those with serious consequences.

Risks can be evaluated qualitatively or quantitatively. The qualitative analysis re-
fers to understanding of the magnitude of the risk probability and the effect of the
risk in words and visual description methods. The primary technique for the qual-
itative risk evaluation is the Probability-Impact matrix. Quantitative risk evaluation
is more about statistical simulations which can be performed by calculating risk
factors. (Artto et al. 2011, 163-169; Kerzner 2017, 612-618; Männistö 2005, 23-
26.)

3.4.4 Probability-Impact matrices

There are two important dimensions of a risk event: likelihood of the risk event
and the impact or consequences if the risk occurs. A project manager can assess
the likelihood and impact of the risk on a Probability-Impact chart. This is a simple
mechanism to identify and list the risk events related to their project. One side
(axis) of a Probability-Impact matrix or chart lists the relative likelihood of the risk
occurring. The other axis of the matrix shows the relative impact of the risk oc-
curring. (Schwalbe 2009, 180 - 181; Anderson, 2014, 5 – 7.)
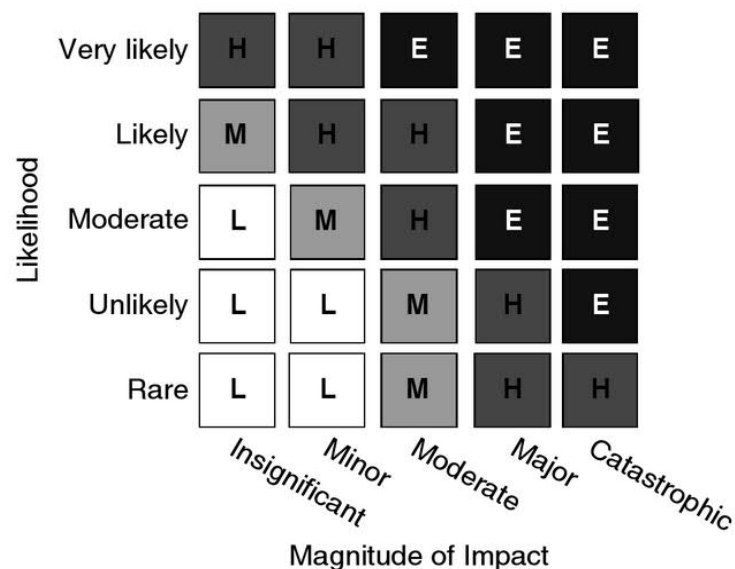

FIGURE 3. Evaluating risk level from likelihood and impact (Anderson 2014, 6).

Figure 3 shows a chart that is often used to prioritize risks, with risk levels labelled
L = Low; M = Medium; H = High; and E=Extreme. Charts with colored risk levels

are called heat maps. Red color is usually used for the high-risk boxes, other colors to present the lower risk levels. (Anderson 2014, 6.)

Table 2 presents how risk will be ranked and presented in a visual way by combining the heat map and Probability-Impact matrix.

TABLE 2. Probability-Impact matrix combined with heat map

LIKELIHOOD	MAGNITUDE				
	Insignificant	Minor	Moderate	Major	Catastrophic
Rare	Very low	Very low	Low	Low	High
Unlikely	Very low	Very low	Low	High	Extreme
Moderate	Very low	Low	Med	High	Extreme
Likely	Low	Med	High	Extreme	Extreme
Very likely	Low	Med	Extreme	Extreme	Extreme

A problem related to the Probability-Impact matrices is the terms of the matrix. Project managers and project stakeholders should be aware what the scale in the matrix means, especially in the middle of the matrix, when it is not that clear where the risk is located and with what critically level. If a risk occurs 'likely' or 'very likely', what are the mitigation actions in each case. The heat map method is a rough but ready tool for the identification for the most critical risks. However, it does not necessary fit to all project forms and risk assessments processes. (Anderson 2014, 7.)

3.4.5 Planning and executing mitigation actions

Mäntyneva states, that a risk can be mitigated by reducing its likelihood or eliminate the actual risk with a selected mitigation actions. Different projects have different risks and therefore mitigations actions can be unique as well. Nevertheless, it is useful to identify typical risks for that specific project type. (Mäntyneva 2016, 137.)

As described in chapter 3.3, a risk management plan and risk register is a place where all the identified and evaluated risks can be located for further measures. Moreover, that the register includes identification information of the risks, its description, possible triggers and evaluation results, also the planned and executed mitigation actions should be stated there (Schwalbe 2009, 177-181).

There are several types of responses that can be used to process the identified and evaluated risks. Examples that Artto et al. (2011, 170-171) presents are bearing responsibility for the risk, transferring the risk, avoiding the risk and decreasing the risk.

Bearing responsibility of the risk is to be aware of the existing risk and be aware of the possible consequences, such as magnitude of the risk. The development of the risk and changes must be monitored constantly. Risk transferring is about transferring the risk to an external source, such as customer or subcontractor. Avoiding the risk means choosing another method to implement the work and therefore avoid the action that caused the risk. The last response type that Artto et al. (2011) lists is risk decreasing. Risks can be decreased by using actions that have effect either to the probability of the risk or to the structure and the impact of the risk. (Artto et al. 2011, 170-171.)

Similarly Kerzner (2017, 620) states, that risk mitigation, also known as *risk control*, is about reducing probability and/or impact through active measures.

3.4.6 Managing risk management activities

Overall risk management process is continuous activity through project lifecycle. Risk management process involves planning and acting before and after risk events. Managing risk management activities is about taking care comprehensively and systematically of all phases in the risk management process. (Artto et al. 2011, 170-171; Anderson 2014, 1-3.)

4 HORIZON 2020 PROJECT

4.1 What is Horizon 2020 project?

Horizon 2020 is European Commission's Research and Innovation framework programme and a financial instrument. It is the biggest EU programme, with nearly 80 billion Euros funding available for its seven-year duration (2014-2020). Horizon 2020 is emphasizing excellent science, industrial leadership and tackling societal challenges. The Horizon 2020 will ensure Europe produces world-class science, remove barriers to innovation and encourage public and private sectors to together produce solutions to big challenges facing our society. Horizon 2020's goal is to help to achieve smart, sustainable and inclusive economic growth. (What is Horizon? n.d.). Horizon 2020 is a funding program for researchers from public and private organization, including small and medium sizes of enterprises. Its focus is for EU international research and third country participation. (Horizon 2020 - Funding project life cycle, 2018).

4.2 Horizon 2020 project lifecycle from management point of view

Horizon 2020 work programme funding opportunities are announced online in Participant Portal. Participant Portal is an electronic platform for managing proposals and projects throughout their lifecycle. (Horizon 2020 - Funding project life cycle, 2018).

The application process starts by submitting a proposal in the specific Horizon 2020 call. The call specifies details of the projects: type, budget, deadlines, conditions and the thematic areas. Many calls require a team of at least three partners. Project partners can be found from Participant portal partner search and by using organization's own stakeholders. Once the proposal submission deadline has passed, all proposals are evaluated by a panel of high-level experts. This specialist panel evaluates and rank each proposal and checks if it should receive funding. (Horizon 2020 - Funding project life cycle, 2018).

Once a project proposal passes to the accepted project stage, EU will prepare a contract called the Grant Agreement with the project consortium. EU will nominate a Project officer to the project who will manage the Grant agreement preparation on behalf of the EU and who acts as a support person for the project. (Horizon 2020 - Funding project life cycle, 2018). The Grant Agreement is a document that states the project coordinator and the participants, what research and innovation activities will be undertaken, the project duration, budget, rates and costs, the European Commission's contribution and all rights and obligations. (How to get funding? n.d.)

The project can start after the Grant Agreement has been signed by EU and the project coordinator and accessed by all the other partners involved. The project starts with a pre-financing payment from the EU, to cover up the start-up costs. The duration of the project is divided into several periods which are specified in the Grant Agreement. In the end of each period, the project consortium will report a summary of all outcomes (deliverables and milestones) of the project in a review meeting. (Horizon 2020 - Funding project life cycle, 2018).

> Deliverables are additional outputs (e.g. information, special report, a technical diagram brochure, list, a software milestone or other building block of the action) that must be produced at a given moment during the action. Milestones are, by contrast, control points in the action that help to chart progress. They may correspond to the completion of a key deliverable, allowing the next phase of the work to begin or be needed at intermediary points. (Annotated model grant agreement 2018, 177).

In the review the project officer and external experts will evaluate if the project has achieved its goals during the period. If so, the consortium is paid for the period. This continues until the end of the project. In the end of the project the consortium prepares and submits a final report with results and publications and receives the final payment, if progress and deliverables are according to the Grant Agreement. Anytime during the project or two year after its termination any participant can be audited by EU audit service in order to check if the costs are in line with the project plan. This is to ensure that all the public funding is used properly. The summary of project final results and conclusions are public and available to all. (Horizon 2020 - Funding project life cycle, 2018).

4.3   Horizon 2020 project stakeholders

The European Commission requires that in every Horizon 2020 collaborative project one of the consortium partner organizations will be assigned as the official project coordinator. Inside the coordination organization there is a person who acts as Principal Investigator of the whole project. According to the official European Commission Grant Agreement and regulations, the project coordinator is defined as a regular beneficiary to the project that holds extra administration and coordination roles. The coordinator serves as a liaison between the consortium members and the European Commission, is responsible for example about the project reporting, the overall monitoring of the project and transferring the beneficiaries' financial shares (pre-financing, periodic payments and payment of the balance). (Coordination dilemma in Horizon 2020, n.d.)

Beside the coordinator, the project may contain one or more beneficiaries and third parties depending on the project form. The internal responsibility of the beneficiary is to provide the needed data, reports and financial statements on time to the project coordinator. As an exception, beneficiaries may purchase goods, works or services provided by third parties. Beneficiaries are fully responsible for their third parties under the Grant agreement. Linked third parties are allowed to fully participate in the action, like the beneficiary they are linked to. They will therefore be treated for many issues like beneficiaries. (Annotated model grant agreement, 2018, 290, 121-122).

Inside the project, there are work package leaders and sometimes task leaders as well. Work package and task leaders have the responsibility for the overall coordinating and supervising of the specific work package or task, and delivering the deliverables related to it. Work package leader and task leader are defined as an organization in the Grant Agreement, but usually organizations nominate a responsible person to carry out the assigned tasks.

Each Horizon 2020 project has its own Project officer who is nominated by the European Commission and who is the project contact person in the EU. The project officer will manage the grant preparation phase and monitor the progress and

technical details of the project during its lifetime. (Horizon 2020 - Funding project life cycle, 2018).

4.4 Management tasks in Horizon 2020 project

Most of the Horizon 2020 project consists one management work package. Management work package is an independent action task with its own resources (person months and budget) and tasks. Horizon 2020 project management tasks contain management for overall coordination of the project in terms of budget and financial performance, deliverables and timely execution of work packages. The project coordinator has always the main responsibility of the project management. However, usually all project beneficiaries are involved in the management tasks as well. Work package leaders have also managerial responsibilities, beside the project core work.

Management in Horizon 2020 project consist of tasks such as:
- the definition of team cooperation software platforms to be adopted
- monitoring the work, including technical results and deliverable preparation
- monitoring the use of resources (budget and person months)
- defining the outputs and project objectives
- coordinating internal reviews of project achievements
- coordinating the work between related work packages
- schedule management coordinating physical and virtual meetings according with the project plan. (Babtista, Charrua-Santos & Pascoa 2015.)
- follow and implement a certain number of rules laid down by the European Commission (Doddoli, 2002, 38).

   Additionally, Horizon 2020 project management include the following tasks:
- create the necessary interface to EU services and other external stakeholders
- take care of the internal communication of the project
- ensure the overall high quality of the project outcomes

- responsibility of the grant preparation phase

- overall management of the intellectual property

- management of legal agreements such as the consortium agreement

- prepare amendments for the project agreements

- coordination of the submission of the project deliverables and milestones

- management of the risks and changes on the project

Projects are executed together with partner organizations and with a coordinator organization. A nominated coordinator, with the support of the European Commission experts, manages projects. Depending on the executed role (coordinator, partner, EU representative) management, tasks differ from each other.

4.5   Project management risks in Horizon 2020 identified by others

It is clear that the project must present all involved risk factors. In Horizon 2020 projects, first risk identification is made already in the proposal phase. The European Commission will not be able to finance either a proposal that does not include any identified risk nor a proposal which contain a 90% risk probability. (Doddoli 2002, 38.) Notable is that most of the identified risks are involved in project core work rather than to the risks in project management.

A risk management plan exists many times as a form of a deliverable in Horizon 2020 projects.

Six public risk management plans that were published as a deliverables in Horizon 2020 projects were examined to give an overview of what are considered the substantial named risks in management. These example projects have different form and are coordinated from different organizations, but all of them are Horizon 2020 projects. These examples were selected due to public availability of a documented risk management plan.

The risk management plans of projects ASSEMBLE Plus, BENEFIT, CITYLAB, EMBRIC, PERFORM and RINGO presented the following risks associated with Horizon 2020 projects management:

- Conflicts in the consortium
- Contact person change, project manager or WP leader change
- Delays in processing payments e.g. due to lack of sufficient information from partners
- Delays in submitting deliverables and reports
- Deliverables does not achieve the expected quality
- Ineffective collaboration among work packages
- Lack of commitment from project linked 3rd parties
- Lack of information received from partners
- Lack of overall coordination and ineffective overall management
- Lack of tools and technology for execution of a deliverable
- No alignment of project focus/results with EC expectations
- Partner failure
- Poor visibility of the impacts and benefits of the project
- Insufficient involvement of advisory board
- Work load significantly different than estimated in the proposal

(ASSEMBLE Plus, 2017; BENEFIT, 2015; CITYLAB, 2015; EMBRIC, 2016; PERFORM, 2016; RINGO, 2017).

5. RESULTS AND RISK REGISTER

In total three research questions were set for this research. The first one is to discover what are the risks involved in Horizon 2020 project management. The second question is to find out what kind of impact discovered risk have had in Horizon 2020 project management. The last research question is looking to answer how H2020 project management risks can be mitigated.

The implemented face-to-face interviews and web survey results provided a comprehensive overview of risks involved in Horizon 2020 project management. The description of the interviews and the web survey were presented in chapter 2. Research Methodology. All the interview and web survey questions are presented in Appendix 1. Web Survey Questions. Respectively, the main results of the web survey and face-to-face interviews are presented in chapters 5.1 and 5.2. The Risk register of the research findings is presented comprehensively in Appendix 2. The results are discussed and the research goal achievement is evaluated in chapter 6. Discussion.

The web survey was implemented during December 2018. Nine interviewees answered to the web survey. Face-to-face interviews were also implemented during December 2018. Three interviews produced more than 3,5 hours of research material. The interview material was transcribed, analysed and summarized.

5.1 Results of the web survey

In the beginning of the web survey, some background information of the interviewees was asked. Questions about the length of work experience among Horizon 2020 project management and experience among other international project management, were set up.

1. How many years of experience do you have in Horizon 2020 project management?
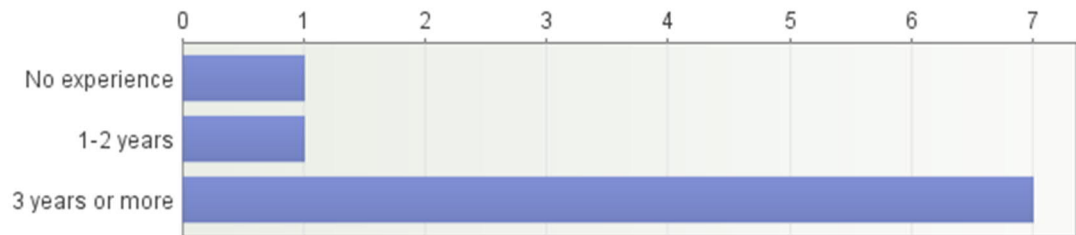
2. How many years of experience do you have in total about international project management?
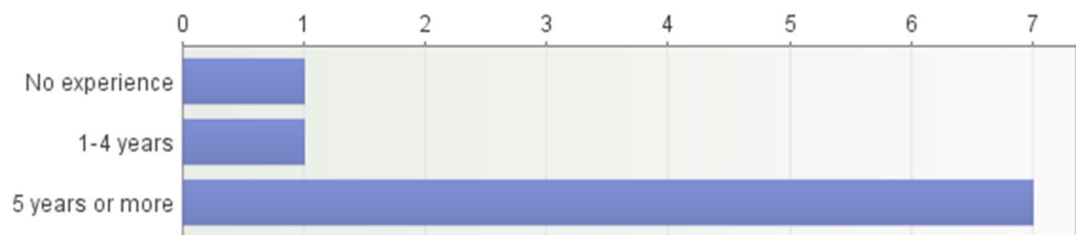
3. What is your position? You may select several options.
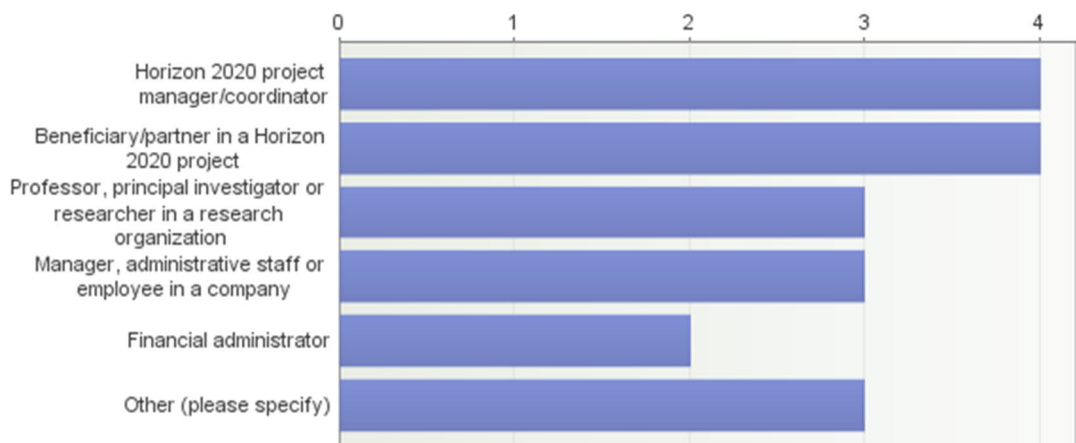
Question 1 and 2 presented that most of the interviewees had more than five year experience not only from Horizon 2020 management, but also about other international project management. Question 3 demonstrates what kind of professions interviewees represent. The question allowed selecting several options. Other positions than provided in the survey were specified in a free text form. Results were as follows: administrator in a research organization, monitor of an EU project and senior grant manager.

4. The following list represents the currently identified risks involved in Horizon 2020 project management. According to your experience, which of the following risks have you identified or encountered in Horizon 2020 project management? You can select as many options as you have experience of. In the end you can provide multiple other management risks you have identified or encountered.
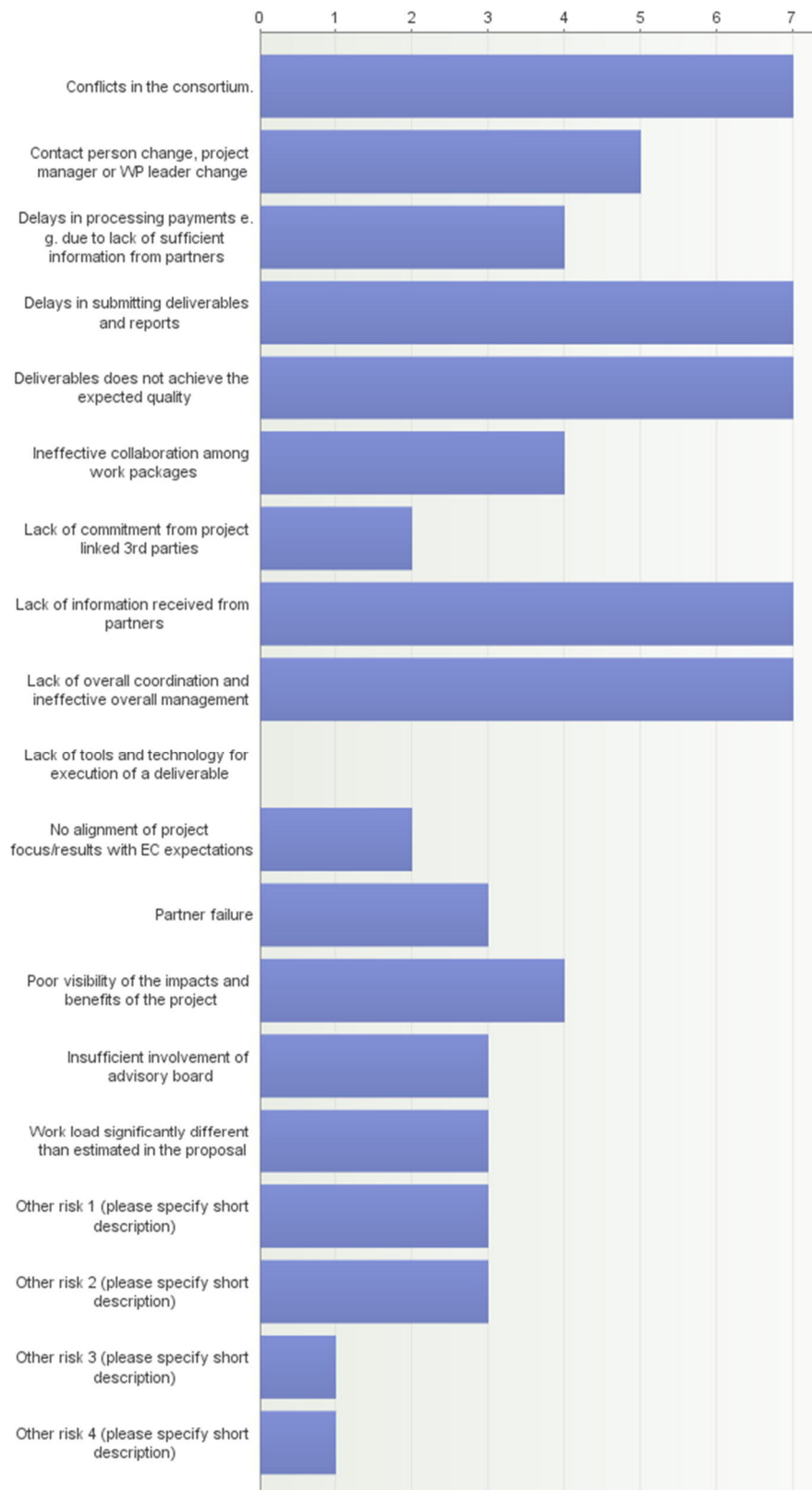
Question 4 is a multiple-choice question that seeks to collect an overall overview of all the detected, either identified or encountered Horizon 2020 project management risks. Risk list got 65 hits for 15 already identified risk. These already identified risks are presented in chapter 4.5 Project management risks in Horizon 2020 identified by others. It was recommend introducing also other risks than presented in the lists.

The next phase in the questionnaire after selecting and introducing new risks, was to answer to detailed questions about each selected or presented risk. Questions were formed as open questions.

1. *You selected that you have experience about "[selected risk from the list]" risk. If this risk would realize, what would be the impact?*
2. *If this risk has realized, what was the impact?*
3. *What kind of remedy actions were implemented or could be implemented to mitigate this risk?*
4. *If remedy actions were implemented, what kind of impact did the remedy actions have?*
5. *What is magnitude of the impact, if the risk realized?*
   Options: insignificant, minor, moderate, major, catastrophic
6. *What is magnitude of the impact, if the risk realized?*
   Options: very likely, likely, moderate, unlikely, rare

Data from interviewees to the above presented questions are summarized in Appendix 2. Risk register, case Horizon 2020 project management.

To get comprehensive research results the aim of the survey was also to discover risks that were not in the presented risk list. The web survey brought up the following 'other' risks:

1. Partner/coordinator does not follow Consortium agreement
2. Inconsistencies or different financial evaluations by financial officers
3. Lack of workforce allocated to the project
4. Implemented work does not match with the reported use of resources
5. Partner is using information outside the consortium without approval
6. Deliverables try to contain much more contents than agreed in the description of action, which can lead to deliverable (and other) delays.

Detailed description, impact on project, likelihood and mitigation actions for these identified risks are presented also in Risk register in Appendix 2.

5.2 Results of the face-to-face interview

Tiainen (2014) states that an interview survey should start with an introduction to the subject. Background material can be presented in advance to the respondent, which might in the best case bring more comprehensive results, than without preparation. (Tiainen 2014, 15-16.) In this face-to-face interview research questions and a summary of management task in Horizon 2020 projects were sent to the interviewees beforehand. A list of the management tasks was to remind what is the environment to which the questions are related to. It was optional to familiarize with the material beforehand.

First, the professional background of interviewees was asked. Two of the respondent (out of a total of three) had more than five year experience about international project management. Two of the respondents had experience about being a coordinator in a Horizon 2020 project. Two of the respondents had experience about Horizon 2020 project management of about one year. Each of the interviewees' position is in a research organization, but with different job descriptions.

Questions presented in the interview were the same as in the web survey, which are presented in chapter 5.1. Interviews were recorded and transcribed afterwards. The aim of the face-to-face interviews was also to find out the identified or encountered management risks in Horizon 2020 project, but with an oral description. The aim was also to discover the impact of the risks on the project, likelihood and mitigation actions.

Other discovered risks from face-to-face interviews are as follows:

1. Ethical issues and General Data Protection Regulations (GDPR) issue requirements in proposal phase are unclear
2. General understanding is missing in Consortium Agreement negotiation
3. Funder does not understand/know its own rules
4. Audits – general understanding about funder's rules is unclear for the auditor.
5. Recruiting, specifically in Marie Sklodowska-Curie ITN-projects, takes time and difficult to find people, which leads to delays
6. Unclear ownerships of the project results (IPR)

Detailed information and mitigation actions that the interview brought up are presented in the Risk register, in Appendix 2.

5.3 Identified Horizon 2020 project management risks

In addition to the previously identified H2020 project management risks presented in chapter 4.5 Project management risks in Horizon 2020 identified by others, twelve new risks were identified in the survey and the interviews. All the identified risks are presented in table 3 in the alphabetical order. Table 3 include the name of the risk and likelihood and impact assess results carried out in the study. Numbers after the presented assessment tell how many interviewees selected this evaluation criteria and how many interviewees informed that has been encountered this specific risk. The processed results with the risk assessment and description are presented in the final Risk Register in Appendix 2.

TABLE 3. Identified risks in Horizon 2020 project management

Id	Name and the description of the risk	Results from the study carried out	
Number	*Descriptive name and identified triggers that may cause the risk to be realized.*	*Assessment of likelihood № assess. selection/ № respondents*	*Assesment of impact № assess. selection/ № respondents*
1	Inconsistencies or different financial evaluations by financial officers or auditors	Likely 2/2	Minor 1/2 Catastrop. 1/2
2	Conflicts in the consortium	Moderate 5/9	Major 6/9
3	Consortium agreement negotiation. One or more beneficiary do not agree and sign the consortium agreement.	Moderate 1/1	Moderate 1/1
4	Contact person change, project manager or WP leader change	Likely 5/8	Moderate 7/8
5	Delays in processing payments e.g. due to lack of sufficient information from partners	Unlikely 2/6 Moderate 2/6	Major 4/6
6	Delays in submitting deliverables and reports	Moderate 4/9 Likely 4/9	Moderate 6/9
7	Deliverables does not achieve the expected quality	Moderate 6/8	Major 4/8
8	Deliverables try to contain much more contents than agreed in the description of action, which can lead to delays	Moderate 1/1	Minor 1/1
9	Ethical issues and general data protection regulation (GDPR)	Moderate 1/1	Major 1/1
10	Funders does not understand/know its own rules	Likely 1/1	Minor 1/1
11	Implemented work does not match with the reported costs	Likely 1/1	Major 1/1
12	Implemented work is not in line with the used resources	Moderate 1/1	Moderate 1/1
13	Ineffective collaboration among work packages	Moderate 3/5	Moderate 4/5
14	Insufficient involvement of advisory board	Moderate 2/4	Moderate 2/4
15	Lack of commitment from project linked 3rd parties and 3rd parties	Likely 2/4	Moderate 2/4 Major 2/4
16	Lack of information received from partners	Moderate 5/9	Moderate 7/9
17	Lack of overall coordination and ineffective overall management	Unlikely 3/8	Major 4/8
18	Lack of tools and technology for execution of a deliverable	0/9	0/9
19	Lack of workforce allocated to the project	Very likely 1/2 Moderate 1/2	Moderate 2/2
20	No alignment of project focus/results with EC expectations	Likely 1/2 Moderate 1/2	Major 1/2 Catastrop. 1/2
21	Unclear ownership of the project results (IPR)	Moderate 1/1	Moderate 1/1
22	Partner/coordinator does not follow Consortium Agreement	Moderate 1/1	Moderate 1/1
23	Partner failure	Moderate 3/3	Moderate 1/3 Major 1/3 Catastrop. 1/3
24	Partner is using information outside the consortium without approval	Moderate 1/1	Moderate 1/1
25	Poor visibility of the impacts and benefits of the project	Likely 3/6	Major 3/6
26	Recruiting, specifically in Marie Sklodowska-Curie ITN-project	Moderate 1/1	Moderate 1/1
27	Work load significantly different than estimated in the proposal	Very likely 2/4	Moderate 2/4 Minor 2/4

For example, "Moderate 3/5" means that three persons selected that "Moderate" is the right scale for this risk and five person selected that they have experience about this risk.

5.4 Risk register – Risks in Horizon 2020 project management

The main aim of this thesis was to summarize all discovered Horizon 2020 project management risks into a Risk register. Risk register, presented as final in Appendix 2, can be used to recognize management risks from any Horizon 2020 project and can be used as risk management tool, as described in chapter 3.3 Risk management plan and risk register. This Risk register does not include only the name, likelihood assessment and the impact description of the risk, but also mitigation actions, that the interviewees presented. The mitigation action list is not all inclusive but there are diverse options that could be applied to solve risky project situations. Identified risks have been evaluated in order to find what is the likelihood and assessment of impact. The assessment scale to the identified risks in the interviews and web survey were:

Assessment of likelihood: very likely (5), likely (4), moderate (3), unlikely (2), rare (1)
Assessment of impact: catastrophic (5), major (4), moderate (3), minor (2), insignificant (1).

Probability-Impact matrix for evaluating risks is presented earlier in Table 2. The final risk assessment values are determined by multiplying the scores for the probability and impact values together (Risk Matrix Calculations, 2018). In this research, the assessment scale is between 0 and 25. The most critical risks are those that have the highest value.

*Risk assessment (score) = Likelihood * Impact*

For example, table 3 research data presents that *Implemented work does not match with the reported costs* -risk likelihood is evaluated as **likely (4)**. Risks impact is evaluated as **major (4)**. By multiplying values 4 * 4 = 16, the final assessment of the risk is resolved. All risks in the Risk register are evaluated by calculating the risk assessment score in order to have a comprehensive ranking of risks criticist level. Notable is that the identified risks presented in Appendix 2 (Risk Register) are evaluated from many separate projects, therefore the overall assessment is based on general understanding about each of the risks criticality.

6. DISCUSSION

The purpose of selecting two different methods for collecting research data was to receive as many different risk recognitions from H2020 management as possible. The web survey raised several identified risks and the purpose of the face-to-face interviews were to intensify all the received results. Combination of web survey and face-to-face interviews turned out to be an effective way of gathering a comprehensive overall overview of the identified or encountered risks in Horizon 2020 project management. Both methods brought up six new other risks, totaling twelve new identified risks, and both methods brought up wide insight for already identified risks mitigation actions. The questions and results of the web survey and face-to-face interview were equivalent and will be analysed as one entity. Therefore, the observations can be done from all the research material.

The project coordinator is defined as a regular beneficiary to the project that holds extra administration and coordination roles (Coordination dilemma in Horizon 2020, n.d.). Therefore, the research results do not classify if the experienced risks have been occurred in role of a project beneficiary or project coordinator. Mostly both of them are together in the same situation; therefore, all identified risks can be applied in any Horizon 2020 management situation.

6.1 Analysing the results

In the results, there were three identified risks that got nine hits from the eleven respondents. These three risks mostly encountered among the interviewees were:

1. Conflicts in the consortium
2. Delays in submitting deliverables and reports
3. Lack of information received from partners

Likelihood of all of these risks were assess mostly as **moderate (3)**. Magnitude of impact was also evaluated mostly as **moderate (3)**. In total 9 of the 27 identified H2020 management risk was selected to have both **moderate (3)** likelihood and **moderate (3)** impact on project, accordingly total criticality score 9.

Like presented earlier in chapter 3.4.3 Evaluating risks, risks level can be evaluated from likelihood and impact with a Probability-Impact matrix. Probability-Impact matrix combined with a colored heat map demonstrates risk level in a visual way.

LIKELIHOOD	MAGNITUDE				
	Insignificant	Minor	Moderate	Major	Catastrophic
Rare	Very low	Very low	Low	Low	High
Unlikely	Very low	Very low	Low	High	Extreme
Moderate	Very low	Low	Med	High	Extreme
Likely	Low	Med	High	Extreme	Extreme
Very likely	Low	Med	Extreme	Extreme	Extreme

Figure 4. Three most commonly encountered risks situated in the Probability-Impact matrix.

Figure 4 demonstrates that the most commonly encountered risks in Horizon 2020 project management priority level is either high or medium. *Conflicts in the consortium's* likelihood was assessed as **moderate (3)** and impact as **major (4)**. Therefore, it is high prioritized risks. *Delays in submitting deliverables and reports'* likelihood was evaluated as **moderate (3)** or **likely (4)**. Its impact is assessed as **moderate (3)**. Therefore, it has high or medium risk level. *Lack of information* is medium level risk for project, because both likelihood and impact was assessed **moderate (3)**.

By multiplying the scores for the probability and impact values together, *Conflicts in the Consortium* score is 12. *Delays in submitting deliverables and reports* score is 10,5 and *Lack of information received from the partners* score is 9.

From the identified H2020 management risks, highest scores were assessed as follows:

1. Implemented work does not match with the reported costs = 16
2. Poor visibility of the impacts and benefits of the project = 16
3. No alignment of project focus/results with EC expectations = 15,75

On the opposite, lowest scores were assessed as follows:

1. Deliverables try to contain much more content than agreed in the DoA which can lead to delays = 6
2. Lack of overall coordination and ineffective overall management = 8
3. Funder does not understand/know its own rules = 8

Therefore, the most encountered risks are located in the middle of the total evaluating scale (0-25). From the project management point of view, this is a good thing, because the most encountered risks are not the most critical ones. Notable is that each project is different; therefore criticality of each identified risk is more important to do in real case project, in order to get the advance of the ranking.

With the help of prioritizing the identified risks, an overall level of risks shows the most critical ones. The most critical risks are those that are relatively likely to occur and those with serious consequences. (Anderson 2014, 6; Mäntyneva 2016, 136.)

6.1.1 Case examples of encountered Horizon 2020 management risks

Conflicts in the consortium risk got most responses. Reasons for this is not only that it is one of the most encountered risks in Horizon 2020 project management but also that its meaning can stem from different perspectives. *Conflicts in the consortium* impact was described as follows:

- *In the worst case, the whole project becomes really painful: deliverables late / of poor quality, things do not progress, EC become angry*
- *Not reach the objectives of the Project. Have the Project terminated by the EC*
- *Delay in execution of the work, increased workload to mitigate conflicts*
- *Beneficiaries invest time into the conflict rather than deliver work.*
- *Conflicts in the consortium may decrease commitment to the project's overall goals.*
- *Persons, who are involved in conflict, have the tendency to take things personal. In an extreme case, it could lead to the exclusion of a beneficiary or the end of the whole project.*
- *Some partners did not get all the results they promised and hence less money from EC*
- *Delays*
- *In worst case one WP cannot work anymore, which can lead for other WP freeze. Also might end up to a partner rejection, which can freeze whole project action.*

Suggestion for mitigation actions for *Conflict in the consortium* risk were as follows:

- *Continuous contact and discussion.*
- *The coordinator should visit all the partners from time to time.*
- *Have clear goals / deliverables and milestones described in DoA.*
- *The PM (project manager) should seek more regular communication with the party involved and may deduct new risks.*
- *The idea is to locate the problem, such as slow work progress, deviation from the DoA, and talk with the party responsible why this happened.*

- *EC suspended the project for some months. Tighter control by EC implemented.*
- *Experienced coordinator with proactive and competent management team (or help/support in admin issues)*
- *Clear agreements between the consortium on results, IPR, etc.*

Conflicts in the consortium risk is a good example how one risk can lead to another. Artto et al. (2011, 163) states "Risks are often chained together revealing one risk as the cause of another, revealing relationships and interactions among risks, and facilitating understanding of a complex matter." For many identified risk situations, the interviewees highlighted how a small risk can cause another bigger risk that in the end could be catastrophic. This leads to an observation that even a risk that looks very small and insignificant is better to mitigate before it grows or produces more risky situations or bottlenecks. An additional observation from the author is that *Conflicts in the consortium* risk can cause in the end, for future projects, a situation where the coordinator or beneficiaries with many conflicts are not wanted to be involved in new proposals or consortiums. Their reputation as difficult partners can follow and cause negative responses.

Another well-recognized risk was *Lack of information received from the partners*. From the thesis author's experience, the lack of information considers not only information lack from partners or the coordinator but also lack of information received from the European Commission. As presented earlier in table 3, majority of the interviewees evaluated *Lack of information received from the partners* risk to have **moderate (3)** likelihood to appear in a project. In addition, the magnitude of impact was evaluated as **moderate (3)**. Nine of eleven respondents selected that they have encountered or identified this risk, which makes this risk common among Horizon 2020 project management. Another risk that can be classified typical among H2020 projects is *Delays in deliverables*. This is partly because not all projects produce deliverables and because submitted deliverables are very clear evidence of progress and are a base to get payments. Therefore, deliverables have a significant meaning in H2020 projects.

Likewise, Artto et al. (2011, 160-161) states communication related issues is one substantial risk source in any project. In the research survey, the interviewees

provided some remedy actions to mitigate the risk of lack of or poor communication among H2020 management. Suggested mitigation actions were:

a) more detailed planning, including envisions of what could go wrong

b) contact and active discussion

c) meetings with different assemblage; whole consortium, WP-leader, task leader, management team, steering committee etc.

Communication was mentioned as a mitigation action for several other risks e.g. *Conflict in the consortium, Delays in submitting deliverables and reports, Poor visibility of the impacts and benefits of the project, Ineffective collaboration among work packages,* and *Lack of overall coordinating.*

6.2 Observations from mitigation actions

The web survey and face-to-face interview results brought up multiple mitigation actions to the identified risks. An observation which the results indicates is that the first step to mitigation actions is that the risks have been identified. In some cases, mitigation actions could not be implemented or the project manager was not able to do anything for the situation, but the risk was identified and stakeholders were aware what it could lead to and what other risks the situation could cause.

A mitigation action that was raised up in connection with many risks is the importance of meetings and communication. As presented in chapter 4.4 Management tasks in Horizon 2020 project, one important management task in H2020 project management is to arrange physical and virtual meetings according with the project plan (Babtista, Charrua-Santos & Pascoa 2015). Several interviewees highlighted that face-to-face meetings are extremely important to maintain good and open connections among different stakeholders. Therefore, meetings were suggested as remedy action for several different risks in Horizon 2020 management. Doddoli states that a direct visit to the firm is a 'must' because it will set a fundament of the relationship. (Doddoli 2002, 39.) In the beginning of a project, a project kick-off meeting is an excellent occasion to start open and easy day-to-day communication. The meaning of a project Kick-off meeting is to ensure a

successful start for the project and good communication during the entire project lifetime. The kick-off meeting is a meeting or seminar in the beginning of the project which purpose is to commit partners to the project goal, create an inspirational atmosphere, remind about goals and tasks, and create common rules and way to work. (Mäntyneva 2016, 86-87.)

Another recognized risk mitigation method is a well-planned internal government structure. Each Horizon 2020 project has an internal government structure, which has been agreed in the Consortium Agreement together with the project coordinator and beneficiaries. It is up to the project what kind of operating structure they will select. For example, either Executive Board, Management Board, Steering Committee etc. can be nominated. The structure can be such as for example a nominated Management Team is responsible for the risk management plan, but the Executive board is responsible, in collaboration with the Management team, for the overall risk management. (EMBRIC 2016, 6.) Project government teams have regular meetings, which enables continuous risk management.

One face-to-face interview brought up a good practice for risk mitigation action, or rather for risk identification, that is in use in one specific Horizon 2020 project. This project is using a web-based platform among other things to keep record of project meeting notes. In the end of the meeting note template there is a short table where the meeting participants should take a stand if any risk occurred or was raised up during that meeting. This is illustrated in Figure 5. The results will be saved together with the meeting notes. Results are summarized and presented in the project Steering group and required mitigation actions are discussed.

Risk management

Shall be considered in technical meetings and is recommended for all meetings.

Risk management has been discussed	Yes / No

If yes, detail all issues and actions

Issue	Considered	Remedial actions
Loss of key personnel	Yes / No	
Lack of skills / Identification of need for new skill	Yes / No	
Unclarity / Disagreement about goals / methods	Yes / No	
Anticipated delay of deliverable / cost overrun	Yes / No	
Anticipated IPR / confidentiality issue	Yes / No	
Any other	Yes / No	

Figure 5. Example of a risk identification method in the project meeting notes

6.3 Comparing results to former research

Research and orientation to this specific subject showed that there are no previous research about Horizon 2020 project management related risks. However, risk management and risk management processes in general are widely researched. Research results, which were discovered in this study, can be combined and compared with the findings from the theoretical framework. In chapter 3.1 What is a risk, Mäntyneva presents that typical risk areas in a projects are schedules, unclear roles and responsibilities, financing, use of key resources, technology, deliverable quality, organization commitment to project preparation, planning and implementation, and unclear goals. Based on the research results, it is possible to state that most of the risk sources Mäntyneva lists can be identified also from the risks in Horizon 2020 project management. Only "technology" is a sector that did not rise up from the interviews or in the web survey, where it was presented as risk of *Lack of tools and technology for execution of a deliverable*. Artto et al. complements Mäntyneva's list with risk sources, which could also be identified from Horizon 2020 project management. Those risks are such as decision-making speed and content of decisions, the degree of management support and amount of resources provided to the project and communication

(which includes transfer of information, availability of information). (Artto et al. 2011, 160 – 161.)

6.4 Other observations

Opposite to the most encountered risks in field of Horizon 2020 project management is one risk which none of the interviewees selected. This risk is *Lack of tools and technology for execution of a deliverable*. In general, the research results forms a simple and comprehensive summary, Risk register, to get an overall overview to the risks in Horizon 2020 project management. These 27 (excluding *Lack of tools and technology for execution of a deliverable*, which none had experience of) risks, that are also presented in the chapter 5.3 Identified Horizon 2020 project management risks, have been identified or encountered by all the interviewees. None of the identified H2020 management risk impacts were classified as **insignificant (1)** and none of likelihood were evaluated as **rare (1)**.

Inconsistencies or different financial evaluations by financial officers or auditors' risk impact was assessed both **minor (2)** and **catastrophic (5).** This leads to an observation, which more than one interviewee brought up, that it depends on the project phase what kind of grading likelihood and magnitude of the impact evaluation will be assigned to the risk. For example, in the beginning of the project, many risks are not that likely to occur or the impact is not that major. But when the project progresses into full speed and more deliverables and milestones should be prepared, the risk likelihood increases and the impact can be more serious. Also, the time to make mitigation actions gets shorter, when the project goes forward.

Another interesting thing came up during one face-to-face interview when *Deliverable does not achieve expected quality* risk was discussed: if a deliverable has poor quality, the impact to the project from scientific point of view is different from the management point of you. This leads us to chapter 3.4.1 Identifying risks, where Männistö states that it is extremely useful to utilize the experience of a wide range of personnel to ensure that risks are comprehensively identified. The project manager together with other specialists can ensure that all relevant

risks are identified. (Lööw 2002, 59, according to Männistö 2005, 21; Chapman & Ward 2004a, 129-130, according to Männistö 2005, 21.)

As a summary, answers to the research questions of the thesis can be considered well reached. The aim was to discover as many risks as possible, related to the management of Horizon 2020 projects. Results of the research does not conclude whether all possible Horizon 2020 project management related risks were discovered. Nevertheless, the research presents a list of 27 currently identified risks in Horizon 2020 project management. The aim thereafter was to find out what kind of impact the identified risks have had or could have had to the project. General impact was also measured by giving an evaluation from an Impact-Probability matrix. Likewise measuring impact, identified risks got ratings for likelihood. Finally, all identified risks got a suggestion of a mitigation action, that could help control those risks. On the other hand, it would have been beneficial for the research if there had been more interviews, especially qualitative interviews. Interviews brought up lot of case examples of risky situation in the H2020 management. It was interesting to listen the examples and stories how issues were solved. Another thing that could have been interesting to analyze, is how the respondents' roles affect the risk identifying and selecting of the mitigation actions. For example, how project principal investigator, whose background is scientific, differs from administrative project manager's point of views. This research did not provide such data that could have been used to specify results based on the interviewees' roles. Thinking about the future research, it would be interesting to receive similar management risk data analysis from the next European Union framework programme, Horizon Europe.

7. SUMMARY

The objective of this thesis was to discover management related risks from Horizon 2020 projects. At the same time, the aim was to find out their impact to the project, likelihood to occur and remedy actions to mitigate the recognized risks.

The theoretical studies prove that risk management process is a useful method to identify and process risks. Chapter 3 presents risk management processes as a whole. Main steps in the process is identifying risks, evaluating risks, planning and executing responses and managing all risk management activities. The purpose of risk identification is to have an overall understanding about the risks that can affect the project. Identification can be executed by different methods, such as creating a checklist, brainstorm session or even external expert opinion. Evaluation activity defines the magnitude of the risks and their effect on the project and its results. The purpose of planning and executing is to do needed remedy actions to eliminate or mitigate the risks. Risks can be decreased by using actions that have effect either to the probability, to the structure or to the impact of the risk.

One of the goals of this study was to create a Risk register about the encountered risks. In general, Risk register answered to all the research questions. Risk register presents an overall overview on all of the 27 identified Horizon 2020 management risks. The research does not only present 27 recognized risks but also the impact they have or could have had to the projects, magnitude of the impacts, likelihood to occur, and mitigation actions. Risk register was gathered from the previous information about discovered risks and from the implemented web survey and face-to-face interviews. Both the survey and the interviews raised six new risks each, and a total of twelve new risk were brought into awareness.

Risk register demonstrates that the most critical identified risks are *Implemented work does not match with the reported costs* and *Poor visibility of the impacts and benefits of the project.* The conclusion related to the likelihood and impact is that the evaluation can be different depending who of the project stakeholders is evaluating (from what point of view) and in which stage of the project, in the beginning or in the end of the project.

This research presented that mitigation actions for Horizon 2020 management risks are sometimes hard to find. However, there is some recognized mitigation action that work in all different kind of risky situation. For example, good communication is a good start to mitigate any risk. The conclusion is that decisions on the selected mitigation actions should be made considering the overall situation of the risk, rather than using directly some previous established mitigation action. The conclusion is based on the results where interviewees presented different kind of mitigation actions for same identified risk and on the theoretical studies which presents very general ideas. An observation is that it is important to mitigate even the smallest risks as well before they turn into bigger risks and the situation turns catastrophic. Forward thinking and planning is useful.

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APPENDICES

Appendix 1. Web Survey Questions

Management risks in Horizon 2020 projects

The purpose of this questinnaire is to discover all possible risks related to the management of Horizon 2020 projects.

The aim is also discover already used remedy actions and find new mitigation methods.

1. How many years of experience do you have in Horizon 2020 project management? *

☐ No experience
☐ 1-2 years
☐ 3 years or more

2. How many years of experience do you have in total about international project management? *

☐ No experience
☐ 1-4 years
☐ 5 years or more

3. What is your position? You may select several options. *

☐ Horizon 2020 project manager/coordinator
☐ Beneficiary/partner in a Horizon 2020 project
☐ Professor, principal investigator or researcher in a research organization
☐ Manager, administrative staff or employee in a company
☐ Financial administrator
☐ Other (please specify) [_____]

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Management risks in Horizon 2020 projects

4. The following list represents the currently identified risks involved in Horizon 2020 project management.

According to your experience, which of the following risks have you identified or encountered in Horizon 2020 project management? You can select as many options as you have experience of. In the end you can provide multiple other management risks you have identified or encountered. *

☐ Conflicts in the consortium.
☐ Contact person change, project manager or WP leader change
☐ Delays in processing payments e.g. due to lack of sufficient information from partners
☐ Delays in submitting deliverables and reports
☐ Deliverables does not achieve the expected quality
☐ Ineffective collaboration among work packages
☐ Lack of commitment from project linked 3rd parties
☐ Lack of information received from partners
☐ Lack of overall coordination and ineffective overall management
☐ Lack of tools and technology for execution of a deliverable
☐ No alignment of project focus/results with EC expectations
☐ Partner failure
☐ Poor visibility of the impacts and benefits of the project
☐ Insufficient involvement of advisory board
☐ Work load significantly different than estimated in the proposal
☐ Other risk 1 (please specify short description) [   ]
☐ Other risk 2 (please specify short description) [   ]
☐ Other risk 3 (please specify short description) [   ]
☐ Other risk 4 (please specify short description) [   ]

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5. You selected that you have experience about "**Conflicts in the consortium**" risk.

If this risk would realize, what would be the impact?

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6. If this risk has realized, what was the impact?

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7. What kind of remedy actions were implemented or could be implemented to mitigate this risk?

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8. If remedy actions were implemented, what kind of impact did the remedy actions have?

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9. What is the likelihood of the risk? *

○ Very likely
○ Likely
○ Moderate
○ Unlikely
○ Rare

10. What is magnitude of the impact, if the risk realized? *

○ Insignificant
○ Minor
○ Moderate
○ Major
○ Catastrophic

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Management risks in Horizon 2020 projects

119. Additional information.

If you have any other identified Horizon 2020 management risks, please specify its impact, remedy actions, likelihood and magnitude here

120. If you wish to receive the research results, please leave your name and email address here. Your answers will be treated anonymously and with complete confidentiality. Your email address will not be linked to your answers.

Name
Lastname
Email

[<-- Previous] [Submit]

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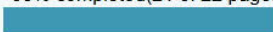
Appendix 2 Risk register, case Horizon 2020 project management

Id Number	Date of identification	Name and the description of the risk. Descriptive name and identify relevant triggers that may cause the risk to be realized.	Impact on project. Describe the nature of the risk and the impact on the project if the risk is not mitigated or managed.	Assessment of likelihood 1-5 where 1 is lowest and 5 highest	Assessment of impact 1-5 where 1 is lowest and 5 highest	Score Likelihood x Impact	Mitigation actions. Specify planned mitigation strategies.	Responsibility for mitigation action(s) coordinator, beneficiary, project manager, WP-leader, EC	Status/results Specify, if the risk event occurred/was the response strategy completed/is the risk still relevant or what was the result.
1		Implemented work does not match with the reported costs	a) inconsistencies in the reporting	4	4	16	a) strong supervision of the work made and the costs reported	beneficiary, coordinator	a) more consistency in the report
2		Poor visibility of the impacts and benefits of the project	a) project results cannot be disseminated properly b) poor evaluation by the EC in dissemination c) rejection of costs and deliverables d) general understanding about project goal and tasks is not clear	4	4	16	a) good dissemination and communication plan b) discuss about the impacts during project meetings c) professional web sites for the project d) invest in conference visibility e) follow the project plan f) clear impact description in proposal	coordinator beneficiary	a) good visibility of the project b) more effort from the partners to dissemination actions c) general idea of project is more clear
3		No alignment of project focus/results with EC expectations	a) rejection by the EC and major supervision from the officer b) variable expectations from EC due to staff changes at the EC c) tighter supervision from the officer	3,5	4,5	15,75	a) better communication with the EC b) better communication with the project officer c) stronger supervision	coordinator, beneficiary, work package leader	a) more involvement of the partners in the project work
4		Inconsistencies or different financial evaluations by financial officers or auditors	a) auditor is not familiar with the instrument rules and can give a wrong statement b) cost rejections	4	3,5	14	a) own knowledge about the rules helps to justify implemented costs b) amendment and more involvement of the partners in the project administrative work	beneficiary, coordinator	a) professional audits
5		Lack of commitment from project linked 3rd parties and 3rd parties	a) delays in project work b) part of the project cannot be done c) they are invisible in the project	4	3,5	14	a) tasks were allocated to project beneficiaries b) inform them and try encourage them to involve, highlight the interesting parts of the project	beneficiary, coordinator	The actions ensured timely completion of the work as planned
6		Work load significantly different than estimated in the proposal	a) redistribution of resources among partners which can lead to conflicts b) an amendment process c) delays in deliverables and reports d) work quality might suffer	5	2,5	12,5	a) strong supervision from coordinator and project officer b) realistic budgeting in the proposal phase c) resource re-allocation	beneficiary, coordinator	a) deliverable quality stayed good b) project completed successfully and new solutions were achieved

Id Num-ber	Date of iden-tifica-tion	Name and the description of the risk Descriptive name and identify relevant triggers that may cause the risk to be realized.	Impact on project Describe the nature of the risk and the impact on the project if the risk is not mitigated or managed.	Assessment of likelihood 1-5 where 1 is lowest and 5 highest	Assessment of impact 1-5 where 1 is lowest and 5 highest	Score Likelihood x Impact	Mitigation actions Specify planned mitigation strategies.	Responsibility for mitigation action(s) coordinator, beneficiary, project manager, WP-leader, EC	Status/results Specify, if the risk event occurred/was the response strategy completed/is the risk still relevant or what was the result.
7		Conflicts in the consortium	a) decrease commitment to the project's overall goals b) beneficiaries invest time into the conflict rather than conducting project work c) delays in deliverables, poor quality, things do not progress d) negative overall team spirit e) if the project objectives are not reached it might in the worst case cause project termination or grant termination f) misunderstanding about each other's aims and objectives	3	4	12	a) continuous contact and discussion b) coordinator visits all the partners during the project to maintain relationships c) redistribution of tasks d) clear goal, deliverable and milestone descriptions in DoA d) clear agreements (CA, IPR, GA) e) experienced coordinator with proactive and competent management team f) temporary suspension of the project g) project manager should locate the problem and discuss with the party involved why this happened h) strong supervision of the partners involved	coordinator, beneficiary, steering committee, advisory board	a) project implementation continues as planned b) project reaches/does not reach all its goals c) deviations from DoA stayed small/large
8		Contact person change, project manager or WP leader change	a) delays in project work b) uncoordinated work between work packages c) deliverable quality suffers d) lack of commitment and motivation of the new person e) partner does not provide a new contact person f) project officer change, which requires to start the communication from the start	4	3	12	a) beforehand planned replacements in case of changes b) support from other partners c) retain payments until the work is done d) clear documentation of the planned work helps the new person to start the work in the project e) inform about the changes f) face-to-face meetings to get to know the new person	project manger, work package leader, beneficiary	a) new person (with or without skills and interest) gets fast into the project implementation b) project can continue as planned c) a new person is nominated to do the tasks
9		Deliverables does not achieve the expected quality	a) rejection by the EC and major supervision from the officer b) delay in payment and failing of the review c) rejected deliverable needs to be redone d) report will be delayed e) poor impact of the project	3	4	12	a) good technical coordination b) communication between the partners c) analyze what went wrong and try and develop internal review system d) set up a realistic schedule e) work steady, not last minute panics f) inform about possible delays	coordinator, beneficiary, work package leaders	a) if discovered too late, not much can be done b) better quality makes the impact better c) more involvement of the partners in the project work d) deliverables were accepted by the project officer

Id Num-ber	Date of iden-tifica-tion	Name and the description of the risk Descriptive name and identify relevant triggers that may cause the risk to be realized.	Impact on project Describe the nature of the risk and the impact on the project if the risk is not mitigated or managed.	Assessment of likelihood 1-5 where 1 is lowest and 5 highest	Assessment of impact 1-5 where 1 is lowest and 5 highest	Score Likelihood x Impact	Mitigation actions Specify planned mitigation strategies.	Responsibility for mitigation action(s) coordinator, beneficiary, project manager, WP-leader, EC	Status/results Specify, if the risk event occurred/was the response strategy completed/is the risk still relevant or what was the result.
10		Ethical issues and general data protection regulation (GDPR)	a) requirements in proposal phase are unclear and can lead to grant rejection	3	4	12	a) to be up-to-date from the subject already in proposal phase	coordinator	Grant is not rejected because poor ethics and GDPR issues
11		Lack of workforce allocated to the project	a) all tasks are not possible to implement b) delays in work c) lack of workforce can cause conflicts among the consortium if one partner is not able to execute the actions fully	4	3	12	a) efficient recruitment actions b) organization supports project and helps with the missing human resources c) try to keep cooperation smooth despite the conflicts	beneficiary coordinator	a) lack of human resources was handled
12		Partner failure	a) project fail b) high administrative work to substitute the partner c) redistribute the work and resources	3	4	12	a) effective management b) proper evaluation of the beneficiaries before inviting into consortium c) high commitment to the project	beneficiary, coordinator	a) project can continue properly until the end of the action
13		Delays in submitting deliverables and reports	a) Periodic report is delayed and therefore payments might be delayed b) mistrust in the coordination work c) delays for other work packages d) quality of the project suffers e) might cause extra reviews from EC f) overall goals are jeopardized g) conflicts can arise h) extra work, extra meetings, extra communication	3,5	3	10,5	a) re-scheduling of consecutive schedules b) continue discussion c) change management d) postpone deliverable dates with an amendment e) regular reminders to the consortium f) more involvement of partners in technical and administrative work g) more internal checks if the partners are still in schedule with their work h) internal deadlines prior to official deadlines i) establish workflows to follow the work and delays	project manager, work package leader, beneficiary	a) part of the work were delegated to other partners to keep the deadline b) project management will be aware of the risk and start the mitigation actions as soon as possible c) more involvement of partners in the technical and administrative work d) all deliverables have been submitted despite the delays
14		Delays in processing payments e.g. due to lack of sufficient information from partners	a) for small companies, in worst case a bankruptcy b) the delaying beneficiary don't receive the payment in time	2,5	4	10	a) reminder to EC/coordinator/partner b) strong supervision of the partners c) more involvement in the administrative actions	European Commission, coordinator, beneficiary	a) payments were completed either on time on delayed
15		Consortium agreement negotiation. One or more beneficiary do not agree and sign the consortium agreement.	a) consortium agreement cannot be completed b) consortium agreement is not in effect because missing signatures	3	3	9	a) start negotiation in good time together with the lawyers	coordinator, beneficiary	a) a valid consortium agreement supports project implementation

Id Num-ber	Date of iden-tifica-tion	Name and the description of the risk Descriptive name and identify relevant triggers that may cause the risk to be realized.	Impact on project Describe the nature of the risk and the impact on the project if the risk is not mitigated or managed.	Assessment of likelihood 1-5 where 1 is lowest and 5 highest	Assessment of impact 1-5 where 1 is lowest and 5 highest	Score Likelihood x Impact	Mitigation actions Specify planned mitigation strategies.	Responsibility for mitigation action(s) coordinator, beneficiary, project manager, WP-leader, EC	Status/results Specify, if the risk event occurred/was the response strategy completed/is the risk still relevant or what was the result.
16		Implemented work is not in line with the used resources	a) this may cause cost rejections b) unbalances in total budget	3	3	9	a) if necessary, inform EC officer b) sharpen the regulations	beneficiary, coordinator	a) implemented work is in line with the project plan b) deviations to the project plan
17		Ineffective collaboration among work packages	a) it could jeopardize important goals of the project b) resources used in a work, which is not needed c) project does not achieve its goals d) might cause conflicts between the partners e) deliverable quality might fail f) delays for the following work package work	3	3	9	a) clear WP descriptions b) more internal meetings and communication c) strong supervision to the partners and more involvement in the project work	work package leader, project manager, coordinator, beneficiary	a) more involvement of the partners in the project work
18		Insufficient involvement of advisory board	a) lack of insight outside the consortium b) lack of support for coordinator c) poor transferability of results d) no exchange of ideas and knowledge	3	3	9	a) careful selection of the board b) keep inviting into project meetings and events	coordinator	a) project gets valuable advises and support
19		Lack of information received from partners	a) Lack of information is crucial to other partners to perform own tasks b) delays in deliverables, payments and reports c) deviations in deliverables d) conflicts in the consortium	3	3	9	a) more detailed planning, including envisioning of what could go wrong b) contact and active discussion c) meetings with different assemblies; whole consortium, WP-leaders, task leaders, management	project manager, work package leader, beneficiaries	a) the consortium may have to adapt to work with different type of information b) more technical and administrative involvement into project c) things were solved and things went more smoothly
20		Unclear ownership of the project results (IPR)	a) several result owners might cause a conflict without proper agreements	3	3	9	a) beforehand prepared detailed agreements b) discussions in project meetings	beneficiary, coordinator	a) no conflicts about the ownerships

Id Num-ber	Date of iden-tifica-tion	Name and the description of the risk Descriptive name and identify relevant triggers that may cause the risk to be realized.	Impact on project Describe the nature of the risk and the impact on the project if the risk is not mitigated or managed.	Assessment of likelihood 1-5 where 1 is lowest and 5 highest	Assessment of impact 1-5 where 1 is lowest and 5 highest	Score Likelihood x Impact	Mitigation actions Specify planned mitigation strategies.	Responsibility for mitigation action(s) coordinator, beneficiary, project manager, WP-leader, EC	Status/results Specify, if the risk event occurred/was the response strategy completed/is the risk still relevant or what was the result.
21		Partner/coordinator does not follow Consortium Agreement	a) meetings are not arranged according consortium agreement which reflects as lack of overall management b) insufficient discussion and collaboration c) approval of publications is not according to the consortium agreement	3	3	9	a) respect the consortium and follow the agreements b) coordinator was forced by other partners to keep in agreement	coordinator, beneficiary	a) project proceeds as planned
22		Partner is using information outside the consortium without approval	a) can restrict applying for a patent b) information used in publication without permission	3	3	9	a) Discussion and warnings	beneficiary	a) on the next occasion they did ask for approval
23		Recruiting, specifically in Marie Sklodowska-Curie ITN-projects	a) takes time and sometimes it is difficult to find people b) deadlines and timing fails	3	3	9	a) planning and estimating beforehand b) advertising jobs on good forums	coordinator, beneficiary	a) recruitments goes as planned and the project can achieve its goals more efficiently
24		Funder does not understand/know its own rules	a) misunderstanding b) rejected costs or deliverables	4	2	8	a) by knowing the rules yourself it is easier to justify actions that have been made	beneficiary, coordinator	a) general understanding of the rules
25		Lack of overall coordination and ineffective overall management	a) delays in reports and payments b) poor results because the project does not reach its objectives c) panic situations d) lot of unnecessary work e) collaboration suffers f) beneficiaries start bottom-up management	2	4	8	a) change of the coordinator b) more meetings and communication c) involvement of more experienced people in administrative and management work d) more collaborative tools e) support from work package leaders	coordinator, beneficiaries, work package leaders	a) project can be steered back on track b) beneficiaries started to steer the project c) better management and better relations with the EC
26		Deliverables try to contain much more content than agreed in the DoA which can lead to delays	a) delays	3	2	6	a) deliverables should follow the DoA and make sure that the consortium delivers as planned	coordinator, work package leader, project manager	a) the consortium will be able to deliver deliverables on time
27		Lack of tools and technology for execution of a deliverable		0	0	0			