# Opportunity Management

Studying the subjectivity of project management and entrepreneurial perspectives for improving opportunity management

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# Delft University of Technology

# Opportunity Management

*Studying the subjectivity of project management and entrepreneurial perspectives for improving opportunity management*

In partial fulfilment of the requirements for the degree of Master of Science in Construction Management and Engineering at Delft University of Technology

In collaboration with Royal HaskoningDHV

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# Preface

My time at the university came to an end with this research. Despite the difficulties, I had two prosperous years in the Netherlands. In the final stage of my formal education, I researched opportunity management and the competencies required for it. I was able to combine all of my interests—opportunities (I am an optimist), entrepreneurship, and competencies—into a wonderful learning experience. But without the help of several people, I could not have progressed as far as I have. I want to thank each of them now while I have the chance.

First and foremost, I want to extend my sincere gratitude to my committee for all of their assistance and advice during the graduation process. I would not have been able to provide the report that is in front of you without their cooperation, support, and direction. I want to especially thank Marian for her thorough feedback on report writing. Hans, thank you for helping me with complex decision making. I want to thank Martijn for keeping a positive attitude throughout the whole process and assisting me in navigating through the challenging terrain I came across. Special thanks to Jan, my company supervisor, for his unwavering support. Your point of view made it easier for me to comprehend the role of a project manager and business developer in the sector.

Second, I want to express my gratitude to Royal HaskoningDHV for proving me with the opportunity to do research with them. I had a great time with people from many fields who were really interested in my study. Additionally, without the assistance of the 30 Royal HaskoningDHV interviewees and survey respondents, this graduation would not have been possible. I would like to thank Wouter at Royal HaskoningDHV for providing me the list of contacts I needed for the survey. I would also like to thank Royal HaskoningDHV's project management knowledge group in mobility and infrastructure for their valuable feedback throughout my thesis.

To conclude, I want to express gratitude to my friends and family for supporting me during my thesis. Special thanks to Barshaleena for providing me with suggestions for improvement.

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Vikas Sharma
Delft, August 2022

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# Executive Summary

Opportunity Management is a well-defined concept in the field of project management. However, at the same time, opportunity management is not practised very well in project management. Threats and opportunities are defined and managed under risk management. However, in reality, more focus is given to the threats, and opportunities are neglected. As research has shown that exploiting opportunities can affect project success positively and negatively, opportunity management is of great importance.

Enhancing project management practices, including the elimination of barriers to project opportunity management, could result in a higher project success rate. Previous studies provide the theoretical framework for opportunity management and has shown a gap between the theoretical concept of opportunity management and practising opportunity management. Opportunity management is gaining traction; however, practitioners' level of competencies remains low. Furthermore, research has also shown that level of competence for opportunity management of practitioners remains low. Studies have identified barriers to opportunity management related to practitioners' competencies. The gap exists in the solutions to those barriers. The barriers have been investigated, but not in connection to competencies.

Researchers have highlighted many barriers to the practical implementation of opportunity management. It was observed that 8 out of 12 barriers are related to competencies and organisational processes. This research tried to overcome those barriers by looking into competencies and learning from entrepreneurs. As entrepreneurs' main job is to create and exploit new business opportunities, this research aims to learn about opportunity management from project managers and entrepreneurs (business developers). Therefore, the research question is as follows:

> ***How can project managers and business developers' views on competencies help improve opportunity management in an organisation?***

The goal of this research is to provide insights into the perspectives of project managers and entrepreneurs regarding competencies which could make practising opportunity management easier and find ways to improve opportunity management.

The Q-methodology is used to investigate the differences in perspectives of project managers and entrepreneurs. Q-methodology is a scientific methodology for identifying groups of people who have similar perspectives on a particular issue. Literature review was undertaken to compile a list of project management and entrepreneurial competencies (applying knowledge, skills and abilities to achieve the desired results). From an extensive list of competencies, 34 are considered to create a wholesome list of competencies (the Q-set). Participants are invited (P-set) and asked to sort the competencies on a chart (Q-sorts). With the help of participants' inputs (21 project managers and business developers from Royal HaskoningDHV), participants are grouped based on their similarities in perspective.

The Q-analysis resulted in a low cumulative explained variance (42%), which means that the identified perspectives might not provide a complete picture of the different perspectives of project managers and business developers. Due to the inconclusive results from Q-analysis, commonalities and differences between the perspectives of project managers and entrepreneurs were studied.

The competencies that rated overall highest are either entrepreneurial or shared competencies (entrepreneurial and project management competencies), such as Opportunity (s10), Creativity (s4) and

Leadership (s8). Contrary to that, Compliance, standards and regulations (s2), Governance, structure and processes (s7) and self-management (s26) are the lowest-rated competencies. Figure 1 illustrates the commonalities and differences in perspectives of business developers and project managers. The reason behind the differences in opinion of project managers and business developers is due to (1) their involvement in different phases and (2) differences in the role they play in a project. Business developers entering a project in the conceptualisation phase found resourcefulness (s22), vision (s34) and personal communication (s12) more important. Whereas project managers are involved in the execution phase of a project, they found negotiation (s9), time (s33) and procurement (s16) more critical for opportunity management. The difference in opinion can be overcome by increasing coherence between project managers and business developers. Project managers need to move their focal point to business oriented by fostering opportunities in alignment with the project portfolio, and opportunities in the direction of the project portfolio will help deliver portfolio benefits. A culture for fostering opportunities can be developed by focusing on organisational benefits by targeting portfolio benefits.
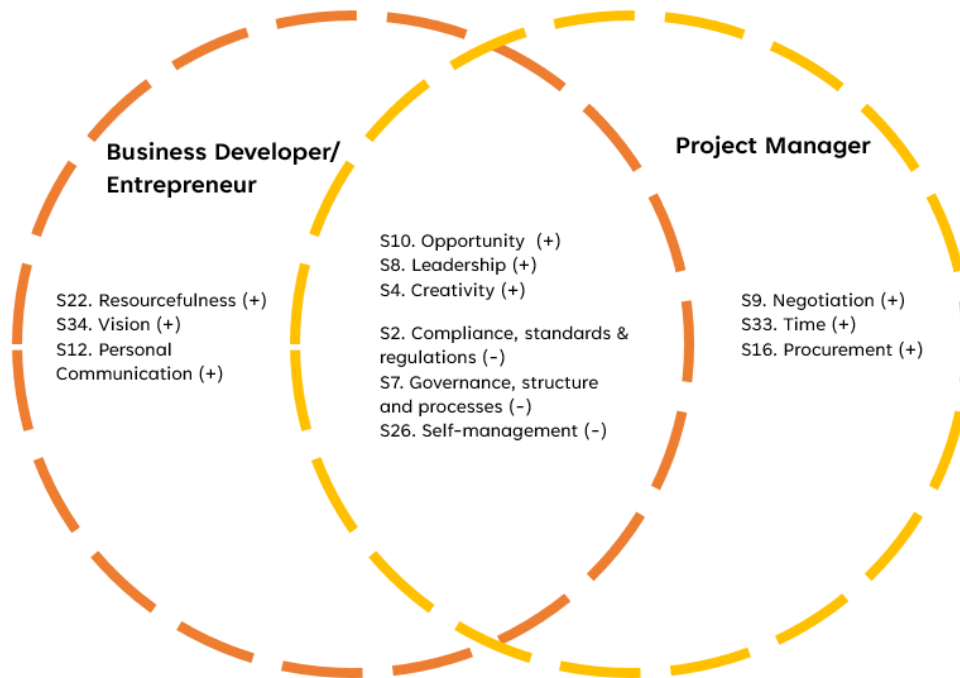


*Figure 1 Commonalities and differences between project managers' and business developers' perspectives*

This research also found that many of the identified opportunities by business developers are not realised properly, as business developers sometimes define unrealistic opportunities. This research further investigated this problem with the handover to a project and concluded that a better handover between a business developer and project manager could be helpful. This research recommends involving the project manager in the conceptualisation phase of a project, and the business developer must remain involved in the initial phase of project execution. This will also provide an opportunity for both roles to look into each other's work, learn from each other and create a business opportunity that is realistic enough to exploit.

At last, this research highlights how it attempts to overcome 8 of the 12 barriers to opportunity management through competencies and other findings.

**Practical Recommendations for improving opportunity management**

The top three practical recommendations from this research are as follows:

1. This research suggests that practitioners should work on competencies, such as Opportunity (s11), Creativity (s4) and Leadership (s4), as these competencies were found essential for opportunity management.
    a. Opportunity: Educate and increase awareness among practitioners about risks, threats and the theory of opportunities management.
    b. Creativity: Project managers must look into organizational strategy and portfolio benefits to discover opportunities and work in that direction. Project managers should create an environment where individuals working in the isolated team get to interact and share ideas with individuals from other disciplines.
    c. Leadership: Project managers should increase the awareness about opportunity management, organisation strategy and portfolio benefits within their team. Project managers acting in the leadership position of a project must foster an environment where the entire team is encouraged to come up with potential opportunities.
2. To improve handover of opportunities from business developers to project managers, project managers should be involved in the conceptualisation phase of a project and business developers should remain involved in the starting phase of project execution.
3. Project managers should foster opportunities in alignment with the project portfolio to deliver towards portfolio benefits and consequently, towards organizational strategy. A culture for fostering opportunities should be developed by focusing on organisational benefits by targeting portfolio benefits.

**Recommendation for future research**

Following are the most important recommendations for future research:

1. This research recommends the EntreComp framework for implementing most competencies practically, but the framework is not tested. Therefore, research on the practical implementation strategy of identified competencies critical for opportunity management should be done.
2. From the literature study and in conjunction with the empirical data gathering, it was noticed that individuals doing project management might not have adequate knowledge about opportunity management. Therefore, a study can be conducted to find innovative ways to educate project managers about opportunity management.
3. This study provides practical recommendations to help practitioners become better at opportunity management. The main question here is how much the individuals, organisations and, on a larger scale, industries are willing to change. Therefore, this study could be extended with literature on barriers to individual behavioural change and see how the leadership of corporate management could help improve the skillset and mindset of individuals towards opportunity management.

**Keywords:** Risk Management, Opportunity Management, Project Management, Entrepreneurs, Competencies, Q-methodology

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# Acronym Used

PM: Project Manager

OM: Opportunity Management

BD: Business Developers (Entrepreneurs of Royal HaskoningDHV)

O: Opportunity/Opportunities

PMI: Project Management Institute

APM: Association of Project Management

HRM: Human Resource Management

IPMA: International Project Management Association

PMCD: Project Manager Competency Development

# Terminology

**Factor in Q-Methodology:** A factor is a set of people holding similar perspectives about the statements mentioned in Q-sort. Factor and perspective are interchangeably used throughout the Q-analysis.

**Business Developer:** Business Developer is a job profile at Royal HaskoningDHV, in which individuals create new business opportunities. Their work profile is similar to entrepreneurs; therefore, business developers were surveyed in place of entrepreneurs.

**Q-sort:** The sorting of the statements in Q-set on a predefined chart.

**P-set:** The set of participants doing Q-sort.

**Q-set:** The set of statements (Competencies) selected for Q-sorting.

**Q-methodology:** The methodology used to study the science of subjectivity and identify commonalities between perspectives on individuals over a certain topic.

**Factor:** In Q-methodology, a factor is a group of individuals having similar perspectives on the statements (Q-set) over a certain topic.

**Q-analysis:** The data interpretation process extracts valuable information from Q-sorts.

**Competence:** The application of knowledge, skills and abilities to achieve the desired results.

**Entrepreneurship:** The process by which individuals –on their own or within organisations – chase opportunities.

# 1. Introduction

In this chapter, Section 1.1 provides some background information on this research topic. Section 1.2 defines the core problem. Section 1.3 provides an overview of project success. They are followed by sections 1.4 and 1.5, where links to studying individual competencies and learning from entrepreneurs are made. Section 1.6 and 1.7 then formulate and describe the research gap and questions. Section 1.8 of this chapter describes the relevance of this study, followed by the report's structure in 1.9.

## 1.1. Background

Risk management has become a fundamental component of project management (Smith and Merritt, 2020). As the role of project management in companies becomes evident, it is clear that risk management applications have expanded beyond the scope and responsibilities of the project itself (Kwak and Smith, 2009). Different methods are used depending on the organisation's risk management proficiency (Turner, 2009). Beginning with the project itself, project managers are responsible for managing the opportunities and threats well within the project's scope and allocating responsibilities to functions that constitute the project team (Turner, 2009).

The theoretical definition of risk management includes both downside risks (threats) and upside risks (opportunities) (APM, 2012). The practice of overweighing threats and ignoring opportunities is also highlighted in recent literature (Riel, 2017). There has been growing consensus on strengthening the risk management processes and accounting for opportunities (Olsson, 2007). Project managers' current practices - to overweigh threats in a project - limit the project's success (Conrow & Charette, 2008). In addition, risk management – including opportunity management - is vital for increasing the project success rate (Rodríguez-Rivero et al., 2020). Therefore, it is crucial to research the possibilities to enhance opportunity management under risk management to increase project success.

An entrepreneur's job is to discover and exploit opportunities, whereas the project manager's job (in practice) is to mitigate the threats and less in discovering and exploiting opportunities. Therefore, by understanding the perspectives of project managers and entrepreneurs, this research will study the competencies that entrepreneurs find more critical for opportunity management compared to project managers. These differences would provide a way forward into the solutions to project managers' barriers while practising opportunity management.

## 1.2. Problem Definition

There is a lot of research and knowledge in the academic world on opportunity management, such as written books explaining the process of defining and planning opportunities (Hillson, 2003). Studies have also exhibited differences in the theoretical framework for risk management (including opportunity management) and how the industry practises risk management (Cooper, 2021). There is a problem with the perception of risk management. Risk managers think about risks as threats and neglect opportunities. Research has also shown that a better definition of risk management and opportunity management could help improve opportunity management (Massaad, 2021).

Research shows a direct link between risk management and the benefits of a project yield at the end of a project (Rodriguez-Rivero et al., 2020). In other words, improving risk management could result in a more significant project yield. These benefits are also a project success criterion (as discussed further). Therefore, improving risk management could result in increased project success.

## 1.3. Project Success

As mentioned in the last paragraph, improving risk management increases project success (Rodríguez-Rivero et al., 2020). As opportunity management comes under risk management, improving opportunity management would also add to project success. But what does project success mean? Different research has defined project success differently, and based on its definition, project success is subjective to interpretation (Atkinson, 1999; Davis, 2014; Munns, 1996; Serrador and Turner, 2015; Koops et al., 2017). In the context of this research, Atkinson's model is used for defining project success. The third criterion, i.e. organisational benefits, is considered the focal point for this research.

As defined by Atkinson (1999), project success is a combination of 4 criteria:

**1st criterion** is the iron triangle: It refers to the project management goals, i.e. delivering the project in time, within budget and at quality.

**2nd criterion** is the information system: It is regarding the long-term suitability of the project, i.e. development with maintainability, reliability, and valuable information.

The **3rd criterion** is the organizational benefits: Working on achieving efficiency, effectiveness, strategic goals and organizational learning. Therefore, this research will focus more on organizational benefits.

Moreover, the **4th criterion** delivers benefits to the stakeholders: Stakeholder satisfaction, social causes and long-term impact on society.

Instead of using a wholesome definition of project success, this research focuses on the third criterion. Therefore, for this research, project success can be defined as delivering a product or direction to the organisation which will help them achieve effectiveness and, in turn, help them achieve their strategic goals.

## 1.4. Studying competencies

One of the most important things to make a project successful is to have a project manager who is capable of taking charge of the project (Müller & Turner, 2007). Before assigning a project manager to a project, organisations do not always consider the project manager's competencies; choosing the wrong project manager frequently leads to project failure (Müller & Turner, 2007). Therefore, there is a need to understand the project manager's competencies to create project success.

In 2013, two researchers statically proved that project success is directly linked to competencies mentioned in ICB 3.0 (Nahod & Radujković, 2013). Therefore, we can further look into competencies to create a change or adapt an individual to a specific job. Competencies are also easy to change, and individuals can adapt to them based on their circumstances (Gruden & Stare, 2018). The above notion, combined with the research on barriers related to opportunity management (Dingelstad, 2021; Massaad, 2021), provides this research with the direction to study individual competencies for improving opportunity management.

## 1.5. Learning from Entrepreneurs

According to Di Muro and Turner (2018), opportunities are essential to entrepreneurship, as entrepreneurship is defined as the process by which individuals — either on their own or within organizations – chase opportunities. Furthermore, as per personality traits studies (Zhao et al., 2010; Masood et al., 2018), three of the Big Five personality traits are essential for project managers, whereas four of the Big Five personality traits are essential for entrepreneurs. These two notions connecting opportunity management to entrepreneurship and entrepreneurship to project management reinforces the idea of investigating other connections between project managers and entrepreneurs' competencies and learning from entrepreneurs about opportunity management.

## 1.6. Research Gap and Objective

According to research, opportunity management is gaining traction; however, practitioners' levels of competence remain low. Dingelstad (2021) and Massaad (2021) have identified barriers to opportunity management related to practitioners' competencies. Gaps exist in the solutions to those barriers, which have not been investigated in connection to competencies.

The objective of this research is to understand the subjectivity of project managers' and entrepreneurs' views on the importance of competencies and improving opportunity management.

## 1.7. Research Question

The following is the main research question for this study:

**Main Question:** *How can project managers' and business developers' views on competencies help improve opportunity management in an organisation?*

Sub-research questions are developed to address the primary research question by breaking it into smaller segments:

*SQ1. What is known about practising opportunity management in the literature?*

The first sub-research Question is answered by conducting a comprehensive literature review.

*SQ2. How do the findings from the literature on opportunity management resonate with practitioners?*

The second sub-research question is answered using exploratory interviews combined with literature evidence.

***SQ3: To what extent do project managers and entrepreneurs have different views on individual competencies for opportunity management?***

Q-methodology was applied, and project managers and entrepreneurs were surveyed. With the help of Q-methodology, this research highlights three perspectives, consensus and differences that project managers and entrepreneurs hold towards competencies required for opportunity management.

***SQ4: How does the expert views relate to the survey findings for improving opportunity management?***

At last, the findings from the survey analysis were presented for an expert consultation, which answers the fourth research question.

## 1.8. Research Relevance

### 1.8.1. Theoretical Relevance

This study presents a perspective of the barriers to opportunity management in practice regarding scientific and theoretical significance. There is a selective focus on project management and entrepreneurial competencies.

Much research has been done on risk management, and a framework for working on upside and downside risks has been developed (Hillson, 2003). Books have been written that extensively explain the application procedure for threats and opportunity management (Hillson, 2003). However, research has also shown that opportunity management is not practised well in real life. This research adds in that direction by looking at what competencies could be essential for opportunity management. This research also investigates the organizational barriers to opportunity management and provides a solution to overcome those barriers.

### 1.8.2. Practical Relevance

Regarding practical application, spotting opportunities is usually a more difficult task for practitioners than spotting threats (Edelenbos and Klijn, 2009). Therefore, finding the core problem and ways to improve opportunity management is essential. Furthermore, better risk management could increase project success (Rodriguez-Rivero et al., 2020). Therefore, as project success is of significant importance to project managers and organisations, the results from this research could help increase project success.

This research showcases the importance of certain project management and entrepreneurial competencies for opportunity management. It also highlights the difference in opinion and the rationale behind project managers and business developers toward competencies required for opportunity management. Furthermore, this research provides practical recommendations to deal with the barriers found in the literature review and exploratory interviews – with the help of competencies. Finally, this research recommends reducing handover-related issues (project handover from business developer to project

manager) and moving project manager focus from project goals to organisational strategy and portfolio benefits.

## 1.9. Structure of the report

The report is organized into seven chapters. The first chapter gives context and outlines the problem description, research gaps, and research questions. The scope of the research and the methodology are described in depth in Chapter 2. The third chapter is a review of the literature and also answers the first sub-research questions. The findings from the exploratory interviews are presented in Chapter 4. Chapter 5 is about Q-methodology, and it explains all the steps that must be followed to carry out the study and showcase the analysis of the survey data. Finally, an expert consultation was conducted to evaluate the findings from the empirical study, which can be found in chapter 6. The findings of this research are discussed in connection with the literature in chapter 7 with further recommendations and limitations. Finally, this report is concluded in Chapter 8 by presenting the conclusions

# 2. Research Design

This section provides the research design by first identifying the research boundaries or scope in Section 2.1, then elaborating on the method adopted for answering the research questions in Section 2.2.

## 2.1. Research Scope

This study is being carried out in collaboration with Royal HaskoningDHV, an international consultant and engineering organization. The study focuses on one of the risk management subcategories, opportunity management.

In this research, the phrases downside risk and threat are used as synonyms to relate to the negative side of risk. On the other hand, upside risk and opportunity all relate to the positive side of risk. As a result, the risk management process may be categorized into two sections: threat management and opportunity management. This study is primarily concerned with opportunity management, for which individual competencies were studied.

According to PWC (2016), risk and opportunity management have gotten increased attention since the 2008 economic crisis, but the degree of competence remains low. Dingelstad (2021) expands on the competencies and identifies some barriers to practising opportunity management. Additionally, Massaad (2021) offered similar barriers related to competencies. This demonstrates the significance of barriers related to competencies in opportunity management practice. However, the solutions to those barriers are not studied in relation to the competencies. This study recognizes additional barriers (that do not come under competencies) but concentrates exclusively on competencies. Figure 2 provides an overview of the scope of this research. From the top, it illustrates the possibilities of various disciplines under project management, and this research focuses on risk management. Under risk management, this research focuses only on opportunity management. Under opportunity management, the main focus of this research is overcoming barriers by focusing on individual competencies. The research is being conducted in the direction indicated by the blue labels connected by the drawn arrows.
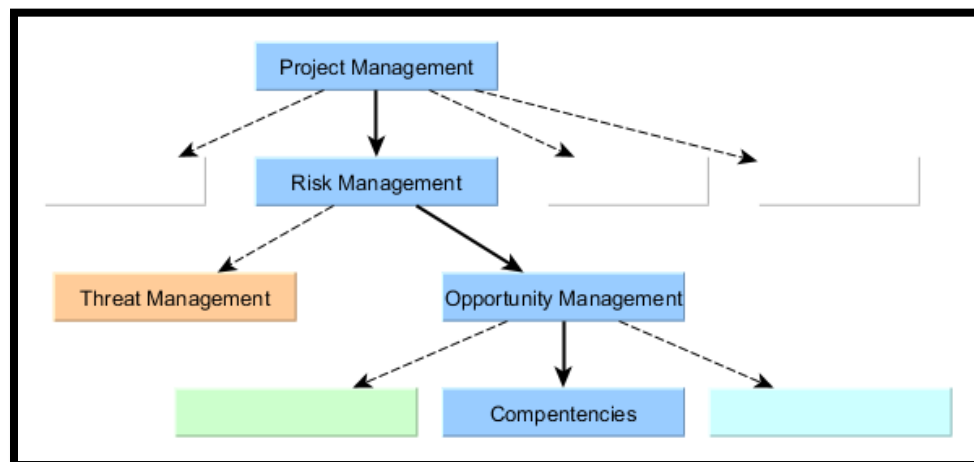


*Figure 2 Research Scope*

## 2.2. Methodology

Research methods are broadly defined as quantitative and qualitative (Tashakkori & Teddlie, 2009). As this research attempts to study experiences, meanings and perspectives, it uses qualitative research methods (Hammarberg et al., 2016).

For answering different questions, different research methods are used. Figure 3 provides an overview of the different steps taken in this research.

> 1. A literature review of the existing research on risk management, opportunity management, project success, entrepreneurs and project management was conducted. In parallel, literature studies on why opportunity management is not practised widely and how different actors perceive opportunities and risks were also studied.

> 2. Exploratory interviews (semi-structured) were conducted with four specialists (higher in management roles). These interviews provided a better understanding of the perception of risks, opportunities and threats and were an exploratory step. The questions asked in the interviews were based on the literature review. The follow-up question allowed the interviewees to express their concerns and views on opportunity management in practice.

> 3. After analysing the results from the exploratory interviews, literature on project management and entrepreneurial competencies was studied.

> 4. From there on, a list of project management and entrepreneurial competencies was finalised, and Q-methodology was used to survey the project managers and entrepreneurs. Q-survey can be done using survey forms as well as interviews. Due to the involvement of participants from different time zones this research used surveys, as it was more appropriate in this case.

> 5. Then, Q-survey data was analysed using the Q Method Software. The result from the survey provides us with a set of perspectives that project managers and business developers hold.

> 6. Finally, the findings from the Q-survey and other notions developed from exploratory surveys and literature reviews are evaluated by conducting expert consultations.

The present application of opportunity management in organisations is limited and is a novel topic to most employees. Under such conditions, a structured approach may result in no answers. Therefore, for this study, semi-structured interviews with open-end questions were conducted. Semi-structured interviews gave interviewees room to express their thoughts on the topic broadly.
The data for this research is gathered from employees working on various projects and at different positions at Royal HaskoningDHV. Therefore, this research will capture diverse opinions and recommendations. For the second part of the research, participants with different levels of experience, different team sizes, and different sizes of projects are surveyed. Diversity helps ensure the coverage of different perspectives.

As mentioned in the methodology, this research uses literature and empirical studies. The following is a more elaborate explanation of all steps of the methodology.
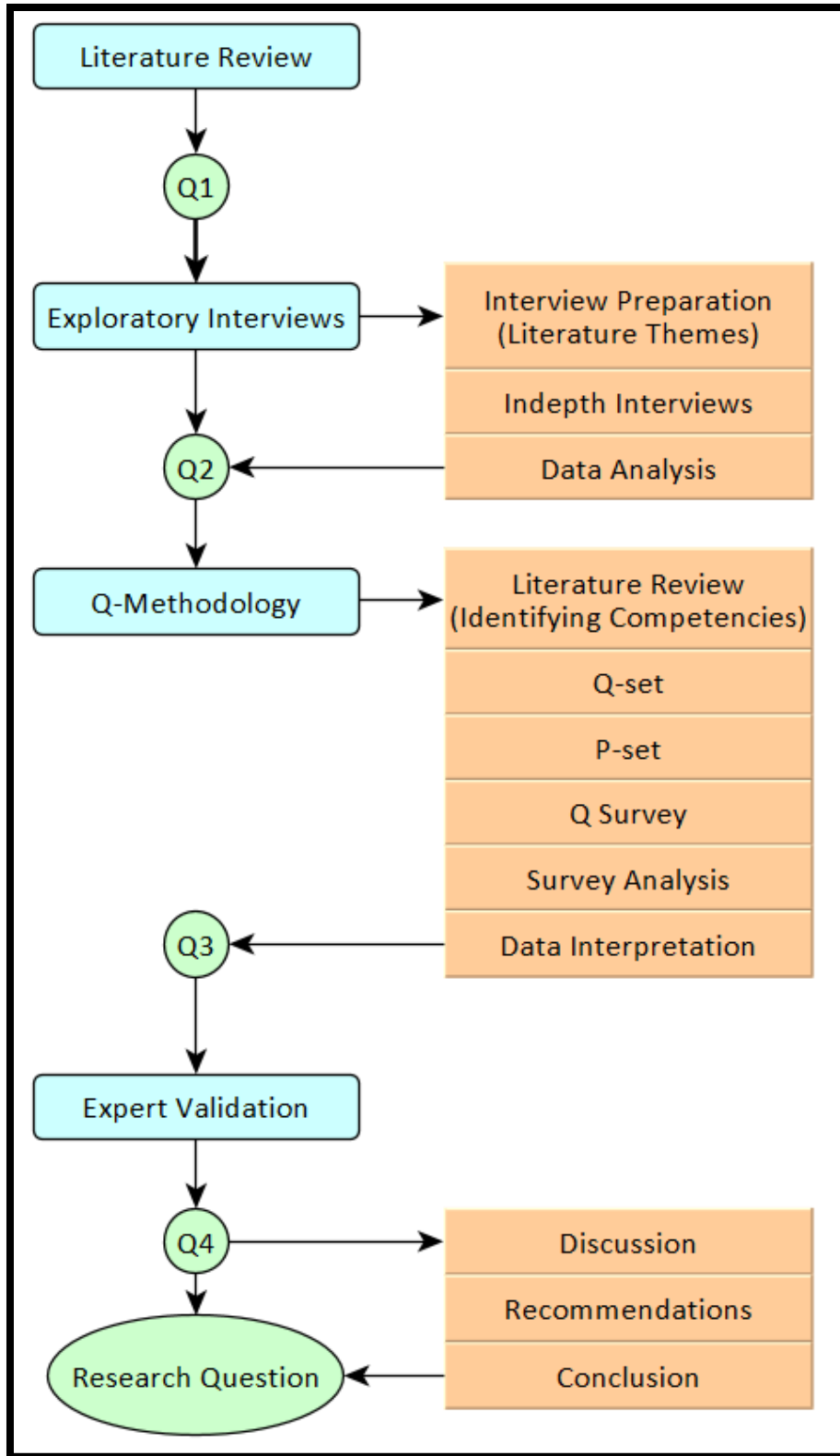
*Figure 3 Research Design flow chart*

### 2.2.1. Literature Study

**Literature Review**

The literature review highlights the definition of risk management, risk and uncertainties, threats and opportunities, and research highlighting the difference between the theory of risk management and how risk management is practised in organisations. This research also adds studies highlighting challenges faced by organisations towards improving opportunity management. Further, a rationale for learning from entrepreneurs and working on competencies was also studied.

**Studying Competencies**

A set of competencies was obtained by studying various literature sources. At first, literature on project management and entrepreneurial competencies was studied. Then rationally, the list of competencies was selected for project management and entrepreneurs.

The literature review is conducted by combining pieces of literature from Google Scholar, Scopus and TU Delft Repository. The literature is a combination of books, articles, research and previous theses.

### 2.2.2. Empirical Study

The Empirical study complements the literature study and creates new findings. The exploratory study, Q-methodology and Expert validation constitute the empirical study.

**Exploratory interviews**

The exploratory interviews were conducted to understand how literature and theoretical notion connect to the reality in the organization. It helped and provided a better understanding of the challenges identified in the literature on practising opportunity management in the industry.

This study is based on two job profiles: project managers and entrepreneurs. Royal HaskoningDHV business developers are the closest job profile to entrepreneurs; therefore, they are chosen to reparent entrepreneurs. A business developer's role is to discover or create new business opportunities. To avoid biased perspectives on opportunity management, neither project managers nor business developers are chosen for these interviews. A project excellence director, a strategic consultant, an innovation manager and an architect (an enthusiast about creating opportunities) were interviewed. This way, multiple perspectives are captured by just conducting four interviews. The selection criteria used for exploratory interviews can be found in chapter 4.

**Q Methodology**

This research uses the Q-methodology to understand the importance of different competencies for opportunity management from the perspectives of project managers and entrepreneurs.

Q-methodology is a study framework that serves as the foundation for the science of subjectivity and whose phenomena are common discussion, commentary, and discourse from everyday life (Brown, 1993). The development of the Q-methodology arose from the need to apply a scientific framework to the perplexing nature of subjectivity. The key to this technique is to think about data in terms of an individual's overall pattern of answers, a self-reference, instead of looking for trends among people (Herrington and Coogan, 2011).

Herrington and Coogan (2011) explain the process. Individuals are asked to determine what is significant to them. They do this using a process known as a Q-sort. This procedure yields a relative collection of judgments. The data from several individuals is then factorially processed, revealing groups of people who ranked attributes similarly. Herrington and Coogan (2011) further explain the Q methodology process. It is critical to have an adequate collection of statements from the concourse that exists around the topic under examination to perform a Q-study since these constitute the essence of the subjectivity, which will potentially arise later from sorting statements by the participants. For the collection of statements, various methods can be used, such as interviews with the participants, literature or requesting a set of statements from those involved in the research process (Watts and Stenner, 2005). Further, those statements have to be sorted and placed under different categories. These categories will ensure that various aspects of the topic of research have been included; it will also help cover all different viewpoints of the individuals.

After categorization is reached, the researcher must attempt to remove any duplication of statements and test the set of statements using a pilot study. Further, the statements (with the sorting questions) are provided to the participants on a scale, such as "completely agree" to "completely disagree", and participants are asked to rate them on the scale (Herrington and Coogan, 2011). Finally, this data from the survey can be further processed using some software.

For this research, Q Method Software was used for collecting the data from the participants as well as analysing the data. Further, based on the analysis, perspectives were identified, and the interpretation of the perspectives was made manually.

## Expert Evaluation

The primary goal of expert evaluation is to evaluate the relevance of the identified solutions to opportunity management. This is performed via the last phase of this project, in which experts were invited to reflect on the findings. Expert consultation was also used to validate the arguments developed based on a literature review and empirical study. Finally, individual meetings with the specialists were held to overcome the social influence (when individuals adapt their opinion based on the opinion of others in the group) (Moussaïd, 2013). Participants in the expert consultation were chosen based on their project management experience and interest.

# 3. Literature Review

This chapter aims to provide theoretical knowledge to understand project managers' and entrepreneurs' definitions, challenges, and competencies and how they link to opportunity management. The chapter starts by defining risk management, uncertainties, threats and opportunities, and how risk management differs in theory from practice (section 3.1). Next, the barriers to opportunity management are presented in section 3.2. Section 3.3 is about discovering and exploiting opportunities. Section 3.4 elaborates on the skillset and mindset required for opportunity management. Further, section 3.5 presents the significance of entrepreneurs in opportunity management. Finally, section 3.6 concludes this chapter by answering the first sub-research question.

## 3.1. Risk Management and Opportunity Management

The Association for Project Management's APMBoK (APM, 2012) distinguishes between threats and opportunities. Risk management, by definition, is a process of understanding and managing risk before it occurs; increase the chances of success by dealing with threats and opportunities (Association for Project Management, 2012). This also means risk is a probable event and might not occur in a particular situation. From an empirical standpoint, risk management is a form of a collection of empirically recognised tools to undertake risk management in an organisation (Besner & Hobbs, 2012). More often than not, individuals get confused between risk and uncertainty and often use both of these terms interchangeably (Liesch et al., 2014).

Risk refers to decision-making scenarios in which the decision-maker is aware of all possibilities and the probability of the event (Park & Shapira, 2017). In contrast, uncertainty refers to situations wherein the decision-maker is unaware of the possibilities and probability of an event (Park & Shapira, 2017). Now with a clear understanding of risks and uncertainties, let us understand different types of risk.

As shown in Figure 2, threats are the downside risks, which means if a threat occurs, it would have a negative impact on the project. Whereas opportunities are the upside risks, which means if an opportunity occurs, it would positively impact the project. As mentioned in the Project management body of knowledge (PMI, 2017), when managing risks, project managers are supposed to minimize the downside risk, which is accomplished by reducing the probability of that event or by reducing the impact of that event; whereas, project managers have to maximize the impact and probability of the upside risks.
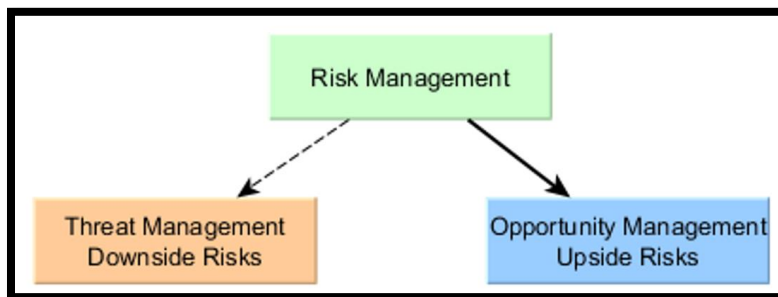


*Figure 2 Types of Risk Management*

Since 1988, there has been evidence regarding managers being threat biased, making them more sensitive towards threats than opportunities (Jackson & Dutton, 1988). Research also shows that participants had a good understanding of threats - when presented with an example of a threat, they acknowledged it, whereas they were reluctant to acknowledge opportunities (Jackson & Dutton, 1988). The practice of overweighing threats and ignoring opportunities is also highlighted in recent literature (Riel, 2017). These present practices – to overweigh threats in a project – by project managers limit the project's success (Conrow & Charette, 2008). Furthermore, the reluctant behaviour to not acknowledge opportunities depicts the biased nature of project managers. With this evidence, there has been growing concern and the necessity to strengthen the risk management process and account for opportunities (Olsson, 2007).

However, why is this happening? Why are project managers showing this reluctant behaviour towards opportunities? Section 3.2 discuss the challenges faced by practitioners.

## 3.2. Challenges Project Managers face when working on opportunities

### 3.2.1. Barriers to including opportunity management under risk management

Hillson et al. (2019) conducted the survey and established five barriers to adopting a wider definition of risk management (which includes threats and opportunities). Massaad (2019) summarized in his research the five barriers as follows:

1. Ignorance: Even after the most recent risk definitions in international standards and guidelines, some people are unaware that the risk management definition includes both the management of threats and opportunities. This negligence prevents the adoption of a risk approach that equally addresses negative and positive risks.
2. Language: The term "risk" has a negative meaning for most people, and the dual meaning is not recognized. Opportunities are considered the inverse of risks, and threats are synonyms for risks, but risks do contain both threats and opportunities. Therefore, a difference should indeed be made between negative and positive risks.
3. Culture: Culture here refers to the culture of an organization/company. If the company and project team culture views and treats risk as entirely negative, this attitude will automatically transfer to the thinking and behaviour of risk managers.
4. Psychology: Threats are seen as deficiency (or primary) requirements in the risk management framework, whereas opportunities are regarded as growth (or secondary) needs. Hillson says threats are usually addressed before opportunities because "the need to survive is greater than the desire to flourish."
5. Inertia: Despite knowing that the risk process should include both threats and opportunities, the project managers find it simpler to use the same accepted method. Following the 'way it has been done in the construction industry for years, they try to ignore it even if a new opportunity arises.

Some of these barriers are related to personal or interpersonal competencies (Ignorance & Language), some are related to the organization (Culture & Psychology), and some are related to external factors (Inertia), such as industry-wide believes. As presented in the scope of the research, this research mainly focuses on

overcoming the barriers related to competencies and organization. This means Inertia, as a barrier, is not studied in this research.

### 3.2.2. Barriers Project Managers face while discovering and implementing opportunities

Massaad (2021) conducted semi-structured interviews and identified barriers to practising Opportunity Management (OM). These seven barriers are as follows:

1. Lack of awareness: Not all project team members were aware of the concept of opportunity management. Which also restricts their mentality to think and explore new opportunities throughout the project.
2. Human nature and mindset: Human "Psychology" tend to focus more on the negatives or the downsides and does not even consider the positive side
3. Lack of a clear and structured process for OM: Many researchers and authors explain the theoretical framework for opportunity management through articles and books. However, this theoretical framework is not adequately integrated into the structured work under project management.
4. Lack of collaboration between different disciplines: For a project involving many disciplines, it is not easy to get a complete picture of opportunities without collaborating on ideas. Metaphorically speaking, different disciplines might have different pieces of a puzzle, and solving that puzzle might yield an opportunity.
5. Opportunities cost money and time: An opportunity is a type of risk; therefore, it always comes with some sunk cost or time. For example, additional measures are taken to avoid threats, which costs time and money; opportunities are not different and come with a sunk cost. This sunk cost is a barrier that stops the project team from exploring opportunities.
6. Opportunities change the project's scope: Sometimes, exploiting an opportunity also requires changes in the scope of the project, which is always not practically doable. Changes in scope could also lead to conflicts, which are more often avoided.
7. The client does not ask OM: OM is never a requirement from the clients. It might be intrinsically good for the client and their contractor, but OM is not required. Therefore, it becomes more optional rather than mandatory to do.

The first two barriers are related to personal competencies. Awareness is part of the project management competencies mentioned in IPMA ICB 4.0 (2018). Human nature and mindset resulted in self-reflection, self-management and spotting opportunities. These are project management and entrepreneurial competencies mentioned in Bacigalupo et al. (2016) and IPMA ICB 4.0 (2018). Furthermore, the fourth barrier is also related to competencies. As, Alshare & Sewailem (2018) highlight, many competencies such as teamwork, leadership, and interpersonal skill could be the underneath cause of lack of collaboration. The third barrier (Lack of clear structure and processes) is related to organisational processes. These four barriers are studied in this research, and the last three barriers – which are related to external factors – are not studied.

## 3.3. Discovering and exploiting opportunities

Other studies discuss the differences between discovering and exploiting opportunities. First, Choi and Shephard (2004) suggested that project managers are good at exploiting opportunities and not so good at discovering them. In contrast, entrepreneurs are good at discovering opportunities and not at exploiting them. Second, Choi and Shephard (2004) proposed some hypotheses - related to entrepreneurs' ability to discover and exploit opportunities - and conducted studies to check those hypotheses. They found that entrepreneurs with a competent management team and strong support from the stakeholders will be more likely to proceed with the exploitation of an opportunity. Choi & Shephard (2004) also highlighted the link between individual traits such as personality traits and competencies to being an entrepreneurial or project manager.

Another study highlighted the importance of experience. Robert and Ensley (2006) found that experienced entrepreneurs work very closely to realise the discovered business opportunity and can create a more practical plan than novice entrepreneurs. Robert and Ensley (2006) proposed some hypotheses on entrepreneurs' experience and ability to exploit opportunities.

## 3.4. Mindset and skillset required for opportunity management

Research on personality traits highlights that project managers need 3 out of the 5 Big Five personality traits and entrepreneurs need 4 out of 5 Big Five personality traits for project success (Masood et al., 2018; Ramirez-Portilla, 2013). Masood et al. (2018) showed that three traits out of the Big Five, i.e. extraversion, emotional stability and openness to experience, had a significant relationship to project success. The other two, i.e. agreeableness and conscientiousness, do not show any relationship to project success. A meta-analysis conducted by Zhao et al. in 2010 researched the personality traits of entrepreneurs and the entrepreneurial process. Zhao et al. (2010) also used the same Big Five personality traits used in research by Masood et al. (2018) on personality traits on project managers. Ramirez-Portilla (2013) highlighted four of the Big Five personality traits (extraversion, emotional stability, openness to experience and conscientiousness) as important for entrepreneurial processes.

Combining the findings of the two pieces of literature provides an overlap between the personality traits of project managers and entrepreneurs. This overlap of personality traits of project managers and entrepreneurs strengthens the notion of looking into other competencies overlaps between project managers and entrepreneurs. Therefore, exploratory interviewees were asked to reflect on the mindset and skillset required for opportunity management.

The research aims to learn from entrepreneurs and entrepreneurial competencies. For the same, there is a need to establish a link between project management, opportunity management and entrepreneurship.

## 3.5. Learning from entrepreneurs about opportunity management

The variety of the definitions of entrepreneur and the role of entrepreneur produced in the literature over the years is daunting (Gartner, 1988). In 1988, Gartner published an article highlighting 32 definitions of

entrepreneurs based on organizational creation, personality traits and characteristics. After that, many other researchers proposed their definitions and characteristics that define entrepreneurs and entrepreneurship (Stevenson & Jarillo, 1990; Bygrave & Hofer, 1991; Bygrave, 1995). Based on these studies in 1998, Carton et al. came up with an operational definition of entrepreneurship. They proposed:

> *"The essence of entrepreneurship is the pursuit of a discontinuous opportunity involving creating an organization (or sub-organization) with the expectation of value creation to the participants. The creation of an organization involves the accumulation and deployment of resources and the building of organizational structure to pursue an opportunity".*

Di Muro & Turner (2018) concluded that opportunities are focal to entrepreneurship to the point that entrepreneurship is claimed to be the process by which individuals – either on their own or inside organizations – pursue opportunities. Another piece of literature highlights that entrepreneurship is a behaviour based on opportunities, and the entrepreneurial act revolves largely around how, from whom, and on what effects opportunities to generate future products and services are identified, assessed, and exploited (Shane & Venkataraman, 2000).

Similarly, Timmons et al. (2004) highlight entrepreneurship as an opportunity-obsessed manner of thinking, reasoning, and action. Entrepreneurial project managers are individuals who actively search out new business opportunities and solutions to project-related issues (Cook, 2017; Fangel, 2018). Finally, Short et al. (2010) claim that there is no entrepreneurship if there is no opportunity, and a potential entrepreneur may be extremely creative and hardworking, but entrepreneurial activities cannot take place in the absence of an opportunity to target these attributes. These arguments from various literature clearly highlight that identifying, assessing and exploiting is at the centre of entrepreneurship.

The Oxford handbook on project management highlights the importance of entrepreneurship in relation to project management and organizational development, is its capacity to discover new opportunities and promote innovative thinking within the organizational context (Söderlund et al., 2012). It finally strengthens the notion that opportunity management establishes a link between project managers and entrepreneurs. When combining this notion with the role of entrepreneurs – to manage opportunities – it can be said that being entrepreneurial will help project managers improve at opportunity management. In other words, as entrepreneurs' main job is to discover and exploit opportunities, it is best to learn from them how project managers could emphasize more on opportunity management.

## 3.6. Conclusion

The purpose of this chapter was to answer the following question:

***SQ1: What is known about practising opportunity management (OM) in the literature?***

The following three questions were used to answer the first sub-research question:

1. *How is opportunity management in theory different from opportunity management in practice?*
2. *What are the barriers that project managers face when working on opportunities?*
3. *What can we learn from entrepreneurs about opportunity management?*

From the literature, it can be witnessed that the definition of risk management includes both threat management and opportunity management. Whereas in practice, opportunity management is not the main focus. Overlooking opportunity management showcases that the project managers are biased towards threats and ignore opportunities.

Research highlights five barriers to including opportunity management under risk management (ignorance, language, culture, psychology and inertia) and seven barriers to practising opportunity management (Lack of awareness, Human nature and mindset, Lack of a clear and structured process for OM, Lack of collaboration between different disciplines, Opportunities cost money and time, Opportunities Change the project's scope, and the client does not ask OM). Some barriers can be addressed by focusing on competencies, some by focusing on organizational processes, and some are related to external factors. This research focuses on 8 out of 12 barriers (Ignorance, language, culture, psychology, Lack of awareness, Human nature and mindset, Lack of a clear and structured process for OM and Lack of collaboration between different disciplines) related to individual competencies and organisations, which are included further in exploratory interviews.

Researchers have highlighted that entrepreneurs are good at discovering opportunities (not exploiting), and project managers are good at exploiting opportunities (not discovering) (Choi and Shephard, 2004). The rationale behind this notion was further studied in exploratory interviews.

The literature review discovered significant overlap in the personality traits of entrepreneurs and project managers for delivering a successful outcome. The overlap of personality traits of project managers and entrepreneurs strengthens the notion of looking into other competencies overlapping between project managers and entrepreneurs to improve opportunity management. Therefore, exploratory interviewees were held to reflect on the mindset and skillset required for opportunity management.

In a narrow description of entrepreneurs, an entrepreneur's job is to create new business opportunities and exploit those opportunities. These connections between the project manager, opportunity management and entrepreneurs further support the concept of learning from entrepreneurs about opportunity management.

# 4. Exploratory interviews and findings

This chapter provides a detailed overview of the exploratory interviews conducted with managers at Royal HaskoningDHV. Section 4.1 explains the interviewees' selection, and brief background information about the interviewees is presented. The questionnaire design is then detailed in Section 4.2 providing an overview of interview themes. Next, section 4.3 presents the findings, which are subsequently examined. Finally, Section 4.4 provides conclusions and answers the second research question.

## 4.1. Exploratory Interview background and Interviewee's selection

The primary purpose of conducting exploratory interviews was to capture the wide variety of perspectives that employees of different designations and with different backgrounds hold. In addition, the exploratory interviews were mainly conducted to confirm the literature and ensure the problem presented in the literature relates to how opportunity management is practised in the industry.

Project managers and entrepreneurs are the two job profiles on which this research is based. So, to suppress biased views on opportunity management, neither project managers nor entrepreneurs were selected for these interviews. Instead, to encapsulate a diverse set of perspectives, employees with different designations were included, i.e. a project excellence director, a strategic consultant, an innovation manager and an architect (who is an enthusiast about creating opportunities) were selected. All of these individuals had sufficient knowledge about opportunity management and have managed opportunities in the past. From a list of 10 employees working at Royal HaskoningDHV, four were selected based on the below-mentioned selection criteria:

1. The interviewees must not be presently working as project managers or business developers.
2. The interviewees must have a different job profile. This was done to get diversity in opinions about the challenges.
3. All interviewees must be from different departments
4. All interviewees must be from different designations.
5. All interviewees must have been involved in identifying or exploiting opportunities. This was done to get the opinion of relevant employees with enough background knowledge to answer interview questions.

## 4.2. Interview questionnaire themes

For the exploratory interviews, seven questions were planned. Out of the seven questions, four focus on the literature, and three are framed to understand the practical problem, remedies, and how this study may be brought forward. Each of these interviews lasted 45 minutes and included seven questions. The exploratory interview was the first step towards this research where the viewpoint or perspective of employees was taken into account, documented and summarized (see Appendix B). These approved summaries are the interpretation of interviews.

The interview questions were based on a few literature themes (sections 3.2, 3.3 and 3.4), summarised at the end of chapter 3. The first theme concerns project managers' skillset and mindset to manage opportunities. Following that, barriers to practising opportunity management were discussed under the second theme. At last, the project manager's suitability for discovering and exploiting opportunities was explored under the third literature theme. The questionnaire used for the interviews can be found in Appendix B. The following section interprets the findings from the interview.

## 4.3. Exploratory Interview Results

### 4.3.1. Importance of mindset a skillset to carry out opportunity management

In the exploratory interviews, question 1 (Appendix B) was framed around the competencies of project managers. Interviewees had different opinions regarding the skillset and mindset required for opportunity management. Interviewee 1 mentioned that "everyone has a very individual mindset, and they try to foster opportunities in the project area that aligns with their mindset". For example, someone might look at business opportunities, not technological ones. Interviewee 2 highlighted that "the value of a team is something we can embrace; everyone will bring something to the table". Therefore, a diverse team composition could increase the number of opportunities identified and exploited. As an organization, Royal HaskoningDHV has many goals and areas in which they would like to discover opportunities; therefore, Royal HaskoningDHV needs to devise a strategy for team composition to cover all of the organisation's goals.

Interviewees mentioned the importance of braveness, comfort level, and willingness to take additional risks for opportunity management. Interviewee 2 highlighted that "you have to be brave to challenge your client; you have to take that risk". Interviewee 3 mentioned that it all comes down to experience" and "if they have either worked on a project which closely resembles an older project, they will have more confidence in exploiting opportunities". Interviewee 4 mentioned that the risk management system, that "people are capable but not aware" as "the first thing our system asks for is "if you have done this project before or not". These competencies relate to personality traits such as openness to experience and extraversion. Mentioning competencies such as braveness, comfort level, and willingness to take a risk also hints toward the personality traits required for project success and exploring opportunities.

### 4.3.2. Barriers to including opportunity management under risk management

As mentioned in chapter 3, 4 of the 5 barriers mentioned by Hillson et al. (2019) for adopting a wider definition of risk management are studied. A broader definition of risk management includes threat and opportunity management under risk management. To confirm the applicability of these barriers in the present situation, interviewees were asked to rate them. They were asked to rate them on a scale of 0 to 10 (0 being the least significant barrier and 10 for the most significant barrier).

The results from the interviews can be seen in Figure 4. All participants rated Ignorance and Culture higher, whereas the consensus on the other two barriers was not that high. Interviews mentioned that language "plays a role but not much" (participant 2), "it is a cultural difference" (participant 4), and "if you have the

right mindset, then language is not a problem". These interviews' comments hint at the little significance of language as a barrier. The barriers mentioned by Hillson et al. (2019) represent challenges in different areas, i.e., some are related to individual competencies, some are related to organisational factors, and some are related to external factors. Therefore, it can be said that the challenge does not lie in one area but in a variety of areas; adopting a wider definition of risk management by improving opportunity management in all those areas could yield great results. Interviewees were asked to provide reasoning behind rating the below-mentioned barriers, and this reasoning can be found in Appendix B.
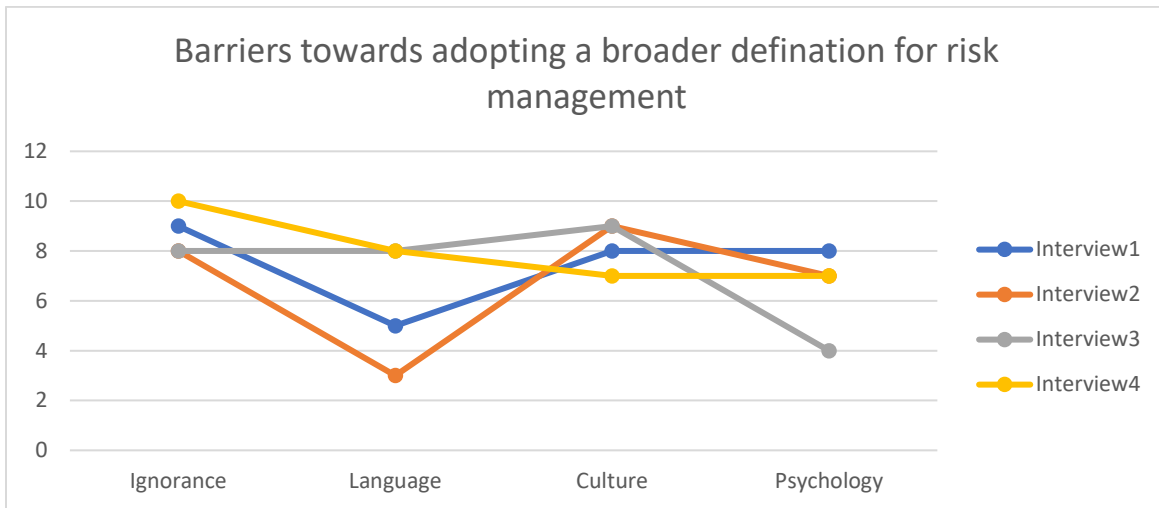


*Figure 4 Rating of barriers to adopting a wider definition of risk management*

*Description: This chart shows the rating interviewees gave to the five barriers to adopting a wider definition of risk management. The highest rated (more important) was ignorance, with an average of 8.75, followed by culture (8.25). Furthermore, the lowest-rated were psychology (6.5) and language (6).*

### 4.3.3. Project Manager's suitability for discovering and exploiting opportunities

Research on discovering and exploiting opportunities suggests that project managers are good at exploiting opportunities and not so good at discovering them (Choi and Shephard, 2004). In contrast, entrepreneurs are good at discovering opportunities and not at exploiting them (Choi & Shephard, 2004). This statement was also used as question 2 in the exploratory interviews (Appendix B). There was good consensus among the interviewees (3 out of 4 agreed) about project managers' incapability to discover opportunities. Interviewee 1 mentioned that "project managers are focused on the target of the firm and mostly in terms of numbers". Interview 2 showed consensus by mentioning "completely agree that BD focus on discovering and PM focus on managing". Interviewee 4 mentioned that project managers are neither good at discovering nor exploiting and are not also facilitated and encouraged to do so.

They also added that it is very subjective and depends on the constraint or freedom a project manager is offered in a project. Interviewee 3 mentioned that entrepreneurs (business developers) sometimes create opportunities that are practically not feasible, limiting project managers' capability to manage those

opportunities. This also highlights that there might be handover-related barriers between entrepreneurs and project managers. Interview 1 added that "the organization asks to keep up with the goals and numbers, which results in overlooking discovered opportunities".

## 4.4.    Conclusion

The purpose of the exploratory interviews was to get practitioners' views on barriers found in the literature. Questions based on three literature themes were asked to the practitioners (barriers to practising opportunity management, discovering and exploiting opportunities, and skillset and mindset for opportunity management). This chapter provides the answer to the following research question:

*SQ2: How do the findings from the literature on opportunity management resonate with practitioners?*

Participants indirectly highlighted the importance of personality traits, such as openness to experience and extraversion, when asked about the skillset and mindset required for opportunity management. These are also the personality traits of successful entrepreneurs and project managers.

Practitioners agreed with most of the barriers to opportunity management, excluding language. Lack of collaboration between different disciplines was also not mentioned. Instead, practitioners highlighted handover-related barriers between the project manager and the business developer. It was mentioned that entrepreneurs sometimes discover unrealistic opportunities, leading to project failure.

At last, questions regarding project managers' ability to discover and exploit opportunities were asked. Interviewees highlighted that project managers are not good at discovering opportunities, and some also suggest they are not good at exploiting them. The project manager's inability to discover opportunities suggests a lack of competencies. In contrast, entrepreneurs are good at discovering opportunities; therefore, this research further looks into entrepreneurial competencies.

The above-presented notion, combined with the entrepreneurs' ability to discover and create new business opportunities, provides a direction to include entrepreneurs and entrepreneurial competencies in this study. Therefore, this study combines project management and entrepreneurial competencies to identify the critical competencies for opportunity management.

# 5. Q Methodology survey

This chapter outlines the implementation and use of the Q-methodology to identify project managers' and entrepreneurs' perspectives on the competencies necessary for opportunity management. From section 5.1 through section 5.5, the process is divided into five steps. This study employs the Q-methodology steps outlined by Van Exel and De Graaf (2005). The first section explains the process of collecting the statements. Following that are sections 5.2 and 5.3, which explain the Q-set and P-set. Next, section 5.4 is data collection, while Section 5.5 is data processing and interpretation. Finally, this chapter ends with a conclusion.

## 5.1. Collecting Statements

The first stage in Q-methodology is to define a Q-concourse, which comprises a wide range of statements describing the topic of interest (Van Exel and De Graaf, 2005). Concourses are statements for communication about any issue (Van Exel and De Graaf, 2005). Because this study focuses on project management and entrepreneur competencies, the statements gathered for this study are the project manager and entrepreneurial competencies. IMPA ICB 4.0 (2018) defines individual competencies as "the application of knowledge, skills, and abilities to accomplish the required results."

Various literature publications containing a list of project management and entrepreneurial competencies were studied to collect the competencies. In Table 5.1, literature referred to for getting a complete picture of competencies can be found. These pieces of literature have categorized competencies differently. For example, leadership is mentioned in one list as "knowledge about leadership" and in another as "Leadership". However, at first, to get the wholesome picture, all of these listed were collected. This results in 40 project management competencies and 75 entrepreneurial competencies. The references used for findings of these competencies can be found in Table 5.1. The rows marked in bold are selected for the final list of competencies. The rationale behind selecting the two highlighted lists of competencies is explained in section 5.2.

*Table 5.1 References used for collecting project management and entrepreneurial competencies*

| Competencies for: | Literature | Number of Competencies Mentioned in the Literature |
|---|---|---|
| Project Manager | Dainty et. al. (2004) | 12 |
| Project Managers | **IMPA ICB 4.0 (2018)** | **28** |
| Entrepreneurs | Mitchelore and Rowley (2018) | 38 |
| Entrepreneurs | **Bacigalupo et. al. (2016)** | **15** |
| Entrepreneurs | Bird (2019) | 22 |

## 5.2. Defining the Q-set

Based on the competencies found in step one, a set of competencies is selected in step 2. This final set of competencies is called Q-set. Watts and Stenner (2005) provide an overview of how to arrive at Q-set. The

Q-set should be a representative sample to ensure that all significant views are recognized during the sorting and analysis. By eliminating gaps and redundancies between statements, a balanced Q-set is achieved. However, there will always be more statements that can then be added to the Q-set; it can never be complete. No single technique could be applied to drive a Q-set out of a Q-concourse; different researchers use different techniques. To arrive at a Q-set, a set of parameters is usually followed (Kampen & Tamas, 2014).

### 5.2.1. The rational process behind selecting the appropriate list of competencies

An explanation of all different sources of competencies can be found in Appendix C. Based on a rational, thoughtful procedure, project management and an entrepreneurial competency list were picked. The final ones were the IPMA project management individual competence list and the European Commission competence list (in bold Table 5.1). This resulted in a list of 43 statements in total.

***Choosing project management competencies list***

Two literature sources were referred for choosing the list of competencies for project management. The first list was provided by Dainty et al. (2004), and the second was obtained from IPMA ICB 4.0 (2018) for project managers. IPMA ICB 4.0 (2018) list was more wholesome, as it covered all 12 competencies mentioned by Dainty et al. (2004).

*Table 5.2 IPMA ICB 4.0 (2018) List of Project Management Competencies*

| People Based | Practice Based | Perspective Based |
|---|---|---|
| •Self-reflection and Self-management<br>•Personal integrity and reliability<br>•Personal communication<br>•Relationships and engagement<br>•Leadership<br>•Teamwork<br>•Conflict and crisis<br>•Resourcefulness<br>•Negotiation<br>•Results orientation | •Project design<br>•Requirements and objectives<br>•Scope<br>•Time<br>•Organization and information<br>•Quality<br>•Finance<br>•Resources<br>•Procurement<br>•Plan and control<br>•Risk and opportunity<br>•Stakeholder<br>•Change and transformation | •Strategy<br>•Governance, structure and processes<br>•Compliance, standards and regulations<br>•Power and interest<br>•Culture and values |

Further, Gruden & Stare (2018) depicted in their paper that many researchers have worked on setting up a list of competencies. They studied and referenced 13 papers and concluded that most of the considered

individually do not offer a complete list. In comparison, the list of competencies provided by IPMA covers all of them. So, to consider a complete list of competencies, this research will use the list of competencies provided by IPMA. Therefore, IPMA ICB 4.0 (2018) was chosen as the final list of competencies from project management competencies. IPMA ICB 4.0 (2018) provides a framework for project management competencies (Table 5.2). It divides competencies into three categories, i.e. People, Perspective and Practice.

### *Choosing entrepreneurial competencies list*

Many researchers have tried compiling and creating a list of entrepreneurs' competencies. This research looks into three lists of entrepreneurial competencies, as these are the latest ones. These competency lists are categorized differently and, therefore, cannot be directly combined. Combining these lists to get a wholesome list will result in huge overlaps between different competencies. Therefore, one list was chosen out of the three to move further.

Mitchelmore and Rowley (2010) and Bird (2019) provided lists with references but did not include elaborate explanations or definitions of those competencies. As a result, many of the competencies mentioned in these two lists were vague. The competencies were also not accompanied by a definition or explanation; hence subjective to interpretation. In contrast, the EntreComp Framework (Bacigalupo et al., 2016), describes the list of competencies. Additionally, the methodology used for developing the EntreComp Framework is robust compared to the other two. EntreComp methodology uses literature review, inventory of practices, case study analysis, expert workshop, expert validation and stakeholder consultation. As the list of competencies presented by EntreComp is a result of a combination of many research methods, it can be said that this EntreComp list is more comprehensive and robust. EntreComp also provides an implementation framework for the competencies. The framework can be further used as an implementation strategy. All three lists of competencies can be found in Appendix C. Table 5.3 is the EntreComp list of competencies.

*Table 5.3 EntreComp Framework (Bacigalupo et al., 2016) List of Entrepreneurial Competencies*

| Ideas & Opportunities | Resources | Into Action |
|---|---|---|
| • Spotting opportunities<br>• Creativity<br>• Vision<br>• Value ideas<br>• Ethical and sustainable thinking | • Self-awareness & self-efficacy<br>• Motivation & perseverance<br>• Mobilising resources<br>• Financial & economic literacy<br>• Mobilising others | • Taking the initiative<br>• Planning & management<br>• Coping with uncertainty, ambiguity & risk<br>• Working with others<br>• Learning through experience |

### 5.2.2. Overlaps in entrepreneurial and project management competencies

The competencies presented in these two lists had significant overlap. The IPMA list of competencies covers 12 of the 15 entrepreneurial competencies. Definition of competencies were used to find overlap between project management and entrepreneurial competencies. For example, mobilising resources overlaps with resourcefulness. Mobilising resources means the ability to "manage the material, non-material and digital resources needed to turn ideas into action" (Bacigalupo et al., 2016). And Resourcefulness means "the ability to apply various techniques and ways of thinking to define, analyse, prioritising, find alternatives way for dealing with a  challenges or problems." (IPMA ICB 4.0, 2018).

Table 5.4 provides a clear overview of the overlap between the list of competencies. On the left is the list of entrepreneurial competencies obtained from EntreComp (Bacigalupo et al., 2016), and on the right are the corresponding overlaps with the project management competencies from  IPMA ICB 4.0 (2018). Some of the entrepreneurial competencies overlap with multiple project management competencies, and therefore, all are added using a ';' separation in the table. A more comprehensive table with overlapping definitions can be found in Appendix C. Where, next to these two columns, the overlap in the definition of competencies is quoted.

*Table 5.4 Overlaps between EntreComp and IPMA list of Competencies*

| S. No. | Entrepreneurial competencies (Bacigalupo et al., 2016) | Project Management Componentises (IPMA ICB 4.0, 2018) |
|---|---|---|
| 1 | Spotting opportunities | Risk and Opportunities |
| 2 | Creativity | - |
| 3 | Vision | - |
| 4 | Valuing ideas | Resourcefulness |
| 5 | Ethical and sustainable thinking | Personal integrity; Reliability |
| 6 | Self-awareness & self-efficacy | Self-reflection; self-management |
| 7 | Motivation & perseverance | Self-management |
| 8 | Mobilising resources | Resourcefulness |
| 9 | Financial & economic literacy | Finance |
| 10 | Mobilising others | Personal communication; Leadership & Teamwork |
| 11 | Taking the initiative | - |
| 12 | Planning & management | Result orientation |
| 13 | Coping with uncertainty, ambiguity & risk | Conflicts and crisis; resourcefulness |
| 14 | Working with others | Relationships and engagement; Conflicts and crisis |
| 15 | Learning through experience | Self-reflection |

### 5.2.3. Defining the final set of Individual Competencies

After reducing these overlaps, the final list of competencies, i.e. the Q-set, consists of 28 project management competencies and 3 entrepreneurial competencies. This resulted in 31 statements for Q-set. In addition, some of the competencies mentioned in IPMA had two competencies combined under one. Therefore, these competencies were split into two. For example, Self-reflection and Self-management were mentioned as combined competencies but had different definitions. Splitting them resulted in 3 additional competencies, which means 34 competencies. These competencies were then arranged in alphabetical order and accompanied by one-line definitions (Table 5.5), which were provided in the survey. A detailed explanation of the selection of definitions can be found in Appendix C.

*Table 5.5 Final set of Individual Competencies used for Q-sort*

| S. No. | Competencies | Definition |
|---|---|---|
| 1 | Change and transformation | Improving and adapting to the emerging developments of a new situation. |
| 2 | Compliance, standards and regulations | Ensures working with compliance, standards and regulations. |
| 3 | Conflict and crisis | Moderating or solving conflicts and crises by being observant of the environment |
| 4 | Creativity | Develop creative and purposeful ideas |
| 5 | Culture and values | Individual's approach to influence the organisation's culture and values and the wider society in which the project is situated |
| 6 | Finance | Cost management, financing and funding are required for a successful project. |
| 7 | Governance, structure and processes | Understating of government structure and processes. |
| 8 | Leadership | Providing direction and guidance to individuals and groups. |
| 9 | Negotiation | Aims to balance interests, needs and expectations to reach a common agreement |
| 10 | Opportunity | Identification, assessment, response and implementation and control |
| 11 | Organization and information | Definitions of required roles and responsibilities as well as an effective information exchange for the temporary organisation. |
| 12 | Personal communication | The exchange of proper information delivered accurately and consistently to all relevant parties |
| 13 | Personal integrity | Acting in accordance with his or her own moral and ethical values and principles. |
| 14 | Plan and control | Ability to regularly update, adapt and improve based on changes happening within the project. |
| 15 | Power and interest | Able to recognize the power and interests of various parties involved. |
| 16 | Procurement | Choosing or taking the optimal procurement routes |
| 17 | Project design | Interpreting demands, wishes and influences of the organisation |

| 18 | Quality | Managing, assuring and controlling the quality of the output of the project |
|----|---------|------------------------------------------------------------------------------|
| 19 | Relationships and engagement | The ability to form strong relationships is primarily driven by social competencies such as empathy, trust, confidence and communication skills. |
| 20 | Reliability | Acting dependably, according to expectations and/or agreed behaviour. |
| 21 | Requirements and objectives | Which objectives are to be reached and which stakeholders' requirements are to be fulfilled |
| 22 | Resourcefulness | Ability to apply various techniques and ways of thinking to define, analyse, prioritising, find alternatives for and solve challenges and problems |
| 23 | Resources | Defining a strategy for acquiring and utilising the resources to the best |
| 24 | Results orientation | Individual prioritises the means and resources to overcome problems, challenges and obstacles to obtain the optimum outcome for all the parties involved |
| 25 | Scope | Ability to define specifics content of the project |
| 26 | Self-management | Ability to set personal goals, to check and adjust progress and to cope with daily work in a systematic way. |
| 27 | Self-reflection | Ability to acknowledge, reflect on and understand one's own emotions, behaviours, preferences and values and to understand their impact. |
| 28 | Stakeholder | Identifying, analysing, engaging and managing their attitudes and expectations |
| 29 | Strategy | Able to define and translate it into manageable elements |
| 30 | Taking the initiative | Initiating the process that creates value |
| 31 | Teamwork | Bringing people together to realise a common objective. |
| 32 | Threat | Identification, assessment, response and implementation and control |
| 33 | Time | Ability to optimize execution by planning for all competent |
| 34 | Vision | Work towards your vision of the future |

## 5.3. Selecting the P-set

The P-set is a carefully chosen group of people who are scientifically relevant to the topic of interest (De Hoog, 2020). The P-set is the group of people who will be doing the Q-sorting. The P-set must be carefully chosen and appropriate to the area of study. Participants are chosen to reflect the range of opinions in a target group rather than the distribution of beliefs throughout the population (Webler et al., 2009).

For this research, employees from Royal HaskoningDHV composed the P-set. As this research is based on project managers and entrepreneurs, job profiles similar to these two roles were used as selection criteria. Therefore, the participant must work at Royal HaskoningDHV as a project manager or business developer.

Business developers are the entrepreneurs of Royal HaskoningDHV, as their primary work is to bring parties together, create a business opportunity and exploit it.

After the selection criteria, the number of participants is established. De Hoog (2020) concluded that there is not a very clear guideline for the number of participants in the study and suggested having somewhere from 20 to 60 participants. For this study, 32 participants were invited. The data collection was done using survey forms, and the survey was kept completely anonymous. Not all participants filled in the survey, and 23 out of 32 filled up the survey form. Nine identified themselves as project managers, eight as business developers (entrepreneurs) and six defined themselves as doing a mix of both roles (taking the role of project manager and business developer).

## 5.4. Collecting Q-sorts

After defining the Q-set (set of statements) and P-set (set of participants), data collection for Q-sorting was done using online software called Q Method Software. Q-sorting can also be done in an interview format (online or face-to-face). However, in the case of this research P-set consisted of participants from different continents and working in different time zone. Therefore, the best alternative for the data collection was an online survey. Q Method Software is an easy-to-use online survey and analysis tool. The software is designed to cater to the Q-sort participants and is user-friendly. The Q-sorting was accompanied by an initial and a follow-up survey.

**Information with the Q-sorting survey**
As the participants involved in the study might have different levels of background knowledge and understanding of the topic, all of the important definitions related to research were provided before the Q-sorting. For example, they might interpret risks, threats and opportunities differently. So, with the help of clear definitions, participants would have submitted the survey with a similar level of background knowledge. A few sets of definitions were provided as part of the information for the survey, which can be found in Appendix C.

**Initial Survey**
Six questions were asked in a survey before the Q-sorting. These questions were mainly to define the data set and get to know the background of the participants. For example, questions related to the job profile, size of projects, team size and project complexity were asked. The questionaries used for the initial survey can be found in Appendix C.

**Q-sorting**
After finishing the initial survey, participants were asked to do Q-sorting. All of the statements (competencies) were numbered in alphabetical order. As not all of the competencies were self-explanatory, and therefore, competencies cards were accompanied by one-line definitions. Q-sorting was done in two stages, resulting in the sorting of 34 competencies. The instructions provided for the Q-sorting can be found in Appendix C. Figure 5 illustrates the Q-sort structure used for this research.
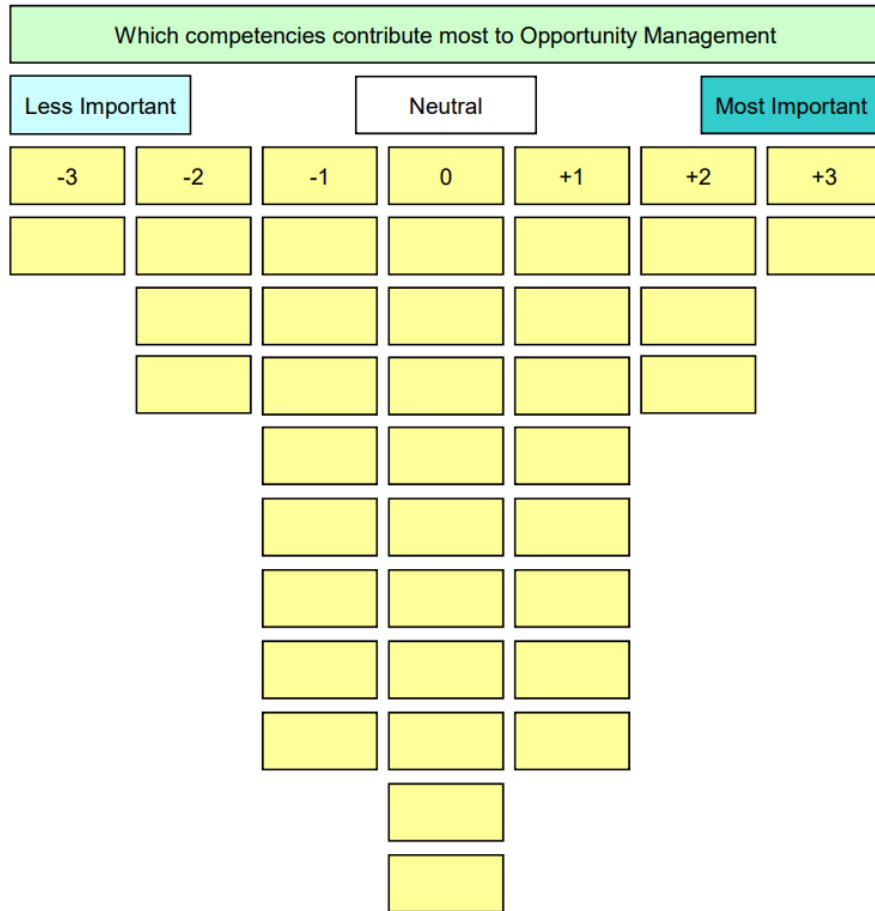
*Figure 5 Q-sorting scheme*

**Follow-up survey on Q-sorting**

After Q-sorting, participants were asked to answer a few questions. These questions were framed to reflect on the reasoning behind extreme Q-sort rating, i.e. participants were asked to provide a reason for the competencies they rated +3, +2, -3 and -2. Following the reasoning questions, three additional questions were also asked. Participants were also asked if they could think of any missing competencies. Next, they were asked about other factors that influence opportunity management. At last, they were asked how entrepreneurial competencies could help project managers become better at opportunity management. The list of questions used for this step can also be found in Appendix C.

## 5.5.  Q-analysis

Following the completion of the Q-survey, the gathered Q-sorts are examined in step 5 of the Q-methodology. Q Method Software was also used for analysis in this study. The Q-analysis is divided into three steps: participant pre-analysis, factor extraction, and identifying perspectives.

### 5.5.1. Participants' pre-analysis

As described in the previous section, 32 practitioners (project managers and entrepreneurs) were invited to Q-sorting. All participants completed the initial survey before proceeding with the Q-sorting. This also aided in the selection of relevant participants. As the initial questions inquired about the participant's function in the company, it screened out participants who were ineligible for the survey and did not meet the established selection criteria. Three participants did not meet the selection criteria and confirmed by replying to the survey invitation. In addition to that, survey turnout was not 100%, rather 23 practitioners completed the survey. Below is the statistical data obtained in the initial survey.

### 5.5.2. Factor Extraction

According to De Hoog (2020), Q-methodology is based on identifying common viewpoints among participants. Then, groups of individuals who similarly performed the Q-sort are grouped, and clusters of people are discovered using factor analysis. Before interpretation, clusters indicate dominating perspectives and are referred to as factors.

At first, the correlation matrix is established. The correlation matrix is the intercorrelation of each Q-sort and every other sort (Watts and Stenner, 2005). The number present in the correlation matrix is the correlation coefficient between 2 corresponding Q-sorts. The correlation coefficient is a statistical indicator of the magnitude of the relationship between different variables' relative movements. The values range from -1.0 to 1.0. Generally, three types of methods are used for finding correlations Pearson, Spearman and Kendall (Zabala, 2014). Presently, Q Method Software gives the option for Pearson and Spearman. Brown (1993) stated that there is no distinction between Pearson and Spearman, and so this study employs the Pearson approach.

As Watts and Stenner (2005) stated, with Q-methodology, this study is trying to identify the patterns of similarity. Factors are the portions of shared perspectives that participants hold.

Factors were extracted using Centroid Factor Analysis (CFA) for this research. Many researchers have tried to find an answer to this but were inconclusive (Watts and Stenner, 2005). Watts and Stenner (2005) provide a magic number of "7 factors" to start with; therefore, the analysis starts with seven factors. As some of these factors were not significant enough, four factors were removed. This resulted in 3 factors with 41% cumulative explained variance.

Following were the rules deployed to find out the most appropriate number of factors:

1. **Kaiser-Guttman Criterion**
   Watts and Stenner (2005) offer a detailed explanation of Kaiser-supplied Guttman's criteria. It recommends removing any factors with Eigenvalues less than 1.0. Eigenvalue (EV) is a statistical measure of a factor and explanatory capability (Watts and Stenner, 2005). Factors 1, 2, 3, and 7 had an EV value greater than 1.0.

2. **Two or more significant loading Q-sorts and Humphrey's rule**

This rule requires the acceptance of factors with two or more substantial factor loadings after extraction (Watts and Stenner, 2005). Brown's formula can be used to compute a substantial loading (Brown, 1980). For a significance level of 0.05, factor loading must be 0.3361 ($1.96/\sqrt{34}$; 34 *is the number of statements*).

Humphrey's rule implements this rule (Watts and Stenner, 2005). According to this definition, a factor is important if the cross-product of its two highest loadings is greater than twice the standard error (Brown, 1980). The standard error for this study is 0.172 ($1/\sqrt{34}$; 34 *is the number of statements*). So, twice the standard error will be 0.343. This results in factors 1, 2, 3, 4, 6 and 7.

3. **The highest number of defining sorts**

Van Exel and De Graaf (2005) propose a set of factors that covers the highest number of Q-sorts. At 0.05 per cent variation, the 3 Factor solution had the most defining Q-sorts. Factor 3 had 21 Q-sorts, and factor 2 had 19. The 6-factor solution cannot be utilized since factor 5 does not include any Q-sorts.

The application of the above-mentioned rules resulted in a 3-factor solution. The three-factor solution offers a cumulative explained variance of 41%, which is relatively low (see section 5.5.4). Following this, factor rotation is carried out. Factor rotation can be carried out using different methods. The Q Method Software provides an option for Hand Rotation and Varimax. This research found Varimax most appropriate and hence used Varimax for factor rotation. The Q Method Software automatically makes all of the calculations for varimax (more explanation on this can be found in Appendix C). The Q-sort with a p-value of 0.05 is used, resulting in 21 Q-sorts out of 23. Factor 1 has 9 Q-sorts, Factor 2 has 6 Q-sorts, and Factor 3 has 6 Q-sorts. In Table 5.6, participants belonging to different factors are highlighted. The numbers in the table represent the participants' factor loading.

*Table 5.6 Factor Loading of 3 Factor Solution*

| Part. No | Participant | Role | Factor 1 | Factor 2 | Factor 3 |
|---|---|---|---|---|---|
| 1 | 2ZZM | Business Developer | 0.8176 | 0.00934 | 0.26877 |
| 2 | 6YDQ | Project Manager | 0.75851 | 0.07065 | 0.13815 |
| 3 | 865U | Project Manager | 0.43357 | 0.31509 | 0.18275 |
| 4 | 8BCF | Project Manager | 0.28819 | 0.20509 | 0.05454 |
| 5 | 8F27 | Business Developer | 0.0308 | 0.00369 | -0.37848 |
| 6 | 8ZJ9 | A mix of both roles | 0.38041 | 0.45287 | 0.38768 |
| 7 | 9XB6 | A mix of both roles | 0.46101 | -0.14214 | -0.02695 |
| 8 | AT45 | Business Developer | 0.79306 | 0.06265 | -0.23603 |
| 9 | B2L5 | Business Developer | 0.73563 | 0.10053 | -0.08919 |
| 10 | BX9O | Project Manager | 0.40114 | 0.29042 | 0.53817 |
| 11 | CFQM | Business Developer | 0.0246 | 0.71469 | 0.13285 |
| 12 | CVTP | Project Manager | 0.06753 | 0.51923 | 0.31051 |
| 13 | HX5L | A mix of both roles | 0.65285 | 0.19045 | 0.09385 |

| 14 | MY2O | Business Developer | 0.13991 | -0.19975 | 0.51807 |
| 15 | N3W3 | Project Manager | 0.32909 | 0.33633 | 0.50191 |
| 16 | O467 | A mix of both roles | -0.05845 | 0.51197 | -0.07218 |
| 17 | R6YT | Project Manager | 0.45245 | -0.11411 | 0.30353 |
| 18 | RVAV | Project Manager | -0.16646 | 0.20025 | 0.61792 |
| 19 | RVD4 | A mix of both roles | 0.37002 | 0.31499 | 0.57561 |
| 20 | SWCE | Business Developer | 0.15073 | 0.38632 | 0.10572 |
| 21 | UP7W | A mix of both roles | -0.0521 | 0.34233 | -0.04406 |
| 22 | WDT5 | Business Developer | 0.13793 | 0.57312 | 0.03524 |
| 23 | WI6T | Project Manager | 0.76995 | 0.07071 | 0.34012 |

### 5.5.3. Identifying Perspectives

The final phase is to identify perspectives and assess qualitative data. As mentioned previously, the study resulted in low cumulative explained variance; therefore, these identified perspectives will require further investigation (probably with a large data set) before practical usage.

The current data analysis produced three factors indicating which statements are essential and which are not for opportunity management. It was discovered that professionals from different backgrounds held all three perspectives. All three perspectives include project managers and entrepreneurs. In addition, a few questions on the type of project business developer and project managers were working on were included in the survey. The statistics reveal that project type is not a controlling factor in shaping an individual's perspective, i.e. professionals working on projects with different team sizes, levels of project complexity, number of participants involved, project duration and cost are spread among all three perspectives. Table C.0.8 in Appendix C provides a detailed insight into the initial survey results. The table depicts how project managers and entrepreneurs working on similar types of projects belonging to different perspectives, i.e. there is no relationship between project type and the perspectives.

Following the Q-sort, the qualitative data collected from participants is evaluated, and conclusions are drawn on the shared perspectives held by participants. Factor arrays (Z- scores) are employed to comprehend factors to build viewpoints (see Appendix C). The Q-analysis findings produce distinguishing, characteristic, and consensus statements for each perspective. These statements are used to offer information about the perspective. Initially, remarks about a factor's extremes are interpreted. These are known as distinguishing statements. The following are the three recognized factors/perspectives:

**Perspective 1: Leadership first**

This perspective focus on the importance of leadership attributes for opportunity management, which can be achieved by providing direction and guidance to individuals and groups. IPMA ICB 4.0 (2018) broadly states that leadership competence is also related to all of the competencies under people, practice and two perspective competencies. The role of a leader also relates to being result-oriented and visionary (IPMA ICB 4.0, 2018), which are the other two most distinguishing competencies for participants under the first perspective. This group also believes in the importance of change and transformation competence for opportunity management.

The first perspective is held by 9 participants and has a 25% explained variance. Table 5.7 displays the distinguishing statements for opportunity management, ranked from most significant to least important by participants holding the first perspective.

This group's participants found leadership to be essential for improving opportunity management (St-8, Z: 1.596). To do this, project managers must be result-oriented (St-24, Z: 0.937) and have a vision for the project (St-34, Z: 0.726). When it comes to opportunity management, these participants believe that time (St-33, Z -1.528), procurement (St-16, Z: -1.501), and governance, structures, and procedures (St-7, Z: -1.468) are the least important competencies. Notably, the Z-scores have a smaller spread for all three of the least Z-scoring statements, which might imply that all three of the least essential claims are the least important.

*Table 5.7 Distinguishing statements of factor 1 (at P< 0.05)*

| Statement Number | Statement | Z-score |
|---|---|---|
| 8 | Leadership | 1.59578 |
| 24 | Results orientation | 0.93686 |
| 34 | Vision | 0.72582 |
| 32 | Threat | 0.6043 |
| 1 | Change and transformation | 0.56598 |
| 27 | Self-reflection | 0.10461 |
| 26 | Self-management | -0.07424 |
| 13 | Personal integrity | -0.13708 |
| 28 | Stakeholder | -0.26864 |
| 3 | Conflict and crisis | -0.66439 |
| 25 | Scope | -0.85205 |
| 6 | Finance | -0.97143 |
| 21 | Requirements and objectives | -1.24506 |
| 7 | Governance, structure and processes | -1.46798 |
| 16 | Procurement | -1.50125 |
| 33 | Time | -1.52817 |

During the interviews, participants emphasized the importance of leadership by saying things like "*Good leadership will encourage entire team to highlight opportunities*" (participant 3), "*Leadership is important to motivate others and create more opportunities*" (participant 6) and "*Team and stakeholders should be willing to think about and accept opportunities. This needs "power" from the PM*" (participant 9).

Reading about the significance of result orientation competence, participant 2 stated, "*Prioritizing different tasks could result in opportunities*", and participant 9 highlighted that "*Result orientation is important as because of that you will stay focused towards results and exploit opportunities for achieving that result*".

In terms of the least important statements (time), participants emphasized: "*Constraint towards Opportunity Management*" (participant 4) and "*Time is a constraint*" (participant 3). Procurement is also one of the least critical abilities, as participants stated that it *"Does not add any value to opportunities"* (participant 2) and is "*Not related to opportunity management*" (participant 5). Participants identified governance, structure, and processes as a "*Limiting competency*" (participant 6) and another mentioned that "*In governmental projects, rules seem to be more important than the result*" (participant 9).

To be competent in opportunity management, project managers should preferably be strong at managing risks (St- 32, Z: 0.604) and change and transformation (St-1, Z: 0.566), according to the defining

participants. Participant 5 brought up an excellent point on threat competence: *"knowing threats could help create opportunities. It is a good idea to create opportunity out of threats"*. Participant 5 also mentioned change and transformation (s2), i.e. "By bringing people together, one can recognize opportunities there".

In contrast, the ability to define the scope (St- 25, Z: -0.852), handle conflicts and crises (St- 3, Z: -0.664), and manage stakeholders (St- 28, Z: -0.269) has almost no impact on opportunity management. According to participant 4, scope "is a limiting factor towards Opportunity management". Similarly, participant 2 mentioned that conflicts are "not related to opportunity management."

**Perspective 2: Planners and controllers**

The principle of this perspective is using plan and control competence for opportunity management. This competence includes skills and abilities such as change management, negotiating for change requests, and issue management (IPMA ICB 4.0, 2018). This group also emphasizes the significance of change and transformation, which overlaps with planning and controlling competence.

The second perspective is about having the technical competencies, or as IPMA ICB 4.0 (2018) mentions, practice competencies for opportunity management. 6 out of 7 distinguishing statements (with a positive Z-score) for this group are individual competencies mentioned under practice in IPMA ICB 4.0 (2018). Also, four of the least Z-scored statements are from people, i.e. personal and interpersonal competencies (as mentioned in IPMA ICB 4.0 (2018) individual competence list).

The second perspective is held by 6 participants and has a 10% explained variance. Table 5.8 displays the distinguishing statements for opportunity management, ranked from most significant to least important by participants holding the second perspective.

Participants in this group feel that the most essential competence for improving opportunity management is planning and control (St-14, Z: 1.570). To strengthen opportunity management, project managers must also have change and transformation competencies (St-24, Z: 0.937), which implies they must be capable of improving and adapting to new situational developments. It is worth noting that the Z-scores have a smaller spread for two of the top Z-score statements, which might imply that these two are equally important for opportunity management. Furthermore, finance competence (St-6, Z: 1.347), i.e., project managers' capacity to handle the cost, finance, and financing, is essential for opportunity management, according to the persons in this perspective.

Personal integrity (St-13, Z -1.551) is not important to these participants when it comes to opportunity management. Furthermore, reliability (St-20, Z: -1.124) and connections and engagement (St-19, Z: -0.981) are also less important.

*Table 5.8 Distinguishing statements of factor 2 (at P< 0.05)*

| Statement Number | Statement | | Z-score | |
|---|---|---|---|---|
| 14 | Plan and control | | | 1.57024 |
| 1 | Change and transformation | | | 1.5458 |
| 6 | Finance | | | 1.34726 |
| 33 | Time | | | 1.07113 |
| 29 | Strategy | | | 0.76743 |
| 18 | Quality | | | 0.5228 |
| 25 | Scope | | | 0.27279 |
| 3 | Conflict and crisis | | | -0.07764 |
| 30 | Taking the initiative | | | -0.09662 |
| 2 | Compliance, standards and regulations | | | -0.18933 |
| 32 | Threat | | | -0.21944 |
| 4 | Creativity | | | -0.25806 |
| 24 | Results orientation | | | -0.53452 |
| 21 | Requirements and objectives | | | -0.60607 |
| 19 | Relationships and engagement | | | -0.98099 |
| 20 | Reliability | | | -1.12377 |
| 13 | Personal integrity | | | -1.55126 |

Plan and control are the most important competence for opportunity management; as participant 5 mentioned, "*uncertainty in the market leads to a varied level of opportunities (both upside and downside). The ability of an organization to adapt to these changes shows its capacity to explore and exploit opportunities they encounter*".

Change and transformation are also near to the most crucial competencies highlighted, with the explanation being "*Change and transformation should be an ongoing process, if you are not able to change according to the market & trends, then you will not be able to compete and build a strong business.*" (Participant 3), "*It is important and quite vital to adapt to emerging changes. The quicker one adapts to these changes; they can then assess the new developments that took place because of the change, which in turn will help them in identifying possible opportunities that can be exploited*" (participant 4) and "*Understanding the emerging trends is imperative in visualizing opportunity management because one can find a novel path/method that could benefit in this ever-changing environment*" (participant 6)

Finance is also vital in opportunity management as "*Financing plays an important role in order to realize the project within the set budget*" (participant 3).

Time (St- 33, Z: 1.071), strategy (St- 29, Z: 0.767), and quality (St- 18, Z: 0.523) are also important for opportunity management. Participant 4 cited time by stating, "*opportunity exploited at the right time is what entrepreneurs need to be good at*", while participant 6 mentioned quality by adding, "*A PM should never compromise on the quality of the project. In the pursuit of finding opportunities, a competent PM would always access the quality of the proposed opportunistic risk*".

Participants from Perspective 2 emphasized the importance of personal integrity by noting, "*Moral values and principles contribute less while working in opportunity management. They might hinder the effectiveness of opportunity management*" (participant 5) and "*There are many people involved in the*

*project with different cultural backgrounds and ethical beliefs. Aligning personal integrity is not a good solution and will take much time to do so*" (participant 3).

Furthermore, individuals mentioned reliability, "*it does not help in recognizing opportunity management. This competency involves benefitting teamwork within a project*" (participant 6).

When it comes to opportunity management, result orientation also plays a little influence; as participants said, "*Focusing on the results does not spark creativity and thus does not give more room to explore opportunities*" (participant 6) and "*Results are the reason that shows the project is running in the right direction. So, this is necessary*" (participant 2).

## Perspective 3: Definers and designers

The core idea behind this perspective is about defining the scope, which is an individual practice competence (IPMA ICB 4.0, 2018). Skills and ability to define scope reflect skills and abilities to define and prioritize work based on the requirements. This perspective is about involving stakeholders and, based on their requirements and objectives, discovering opportunities.

The third perspective is held by six people and has an explained variance of 6%. Table 5.9 presents the distinguishing statements from most important to least important for opportunity management, according to participants holding a third perspective.

Participants in this group felt that the ability to identify specific project content, i.e., scope (St- 25, Z: 1.360), is the most significant competence for improving opportunity management. Project managers must also be competent in fulfilling stakeholders' requirements and goals (St-21, Z: 0.988). Furthermore, the third most distinguishing statement is results orientation (St- 24, Z: 0.323); however, it has a relatively low Z-score. According to these participants, the capacity to regulate and resolve disputes and crises (St-3, Z -1.688) is of the least significance in opportunity management. Furthermore, the capacity to control threats (St- 32, Z: -1.113) and personal integrity competence (St- 13, Z: -0.831) has a small role.

*Table 5.9 Distinguishing statements of factor 3 (at P< 0.05)*

| Statement Number | Statement | Z-score |
|---:|---|---:|
| 25 | Scope | 1.36026 |
| 21 | Requirements and objectives | 0.98825 |
| 24 | Results orientation | 0.3225 |
| 15 | Power and interest | 0.20399 |
| 33 | Time | 0.14268 |
| 11 | Organization and information | 0.06358 |
| 6 | Finance | -0.17104 |
| 1 | Change and transformation | -0.38448 |
| 31 | Teamwork | -0.79907 |
| 13 | Personal integrity | -0.8305 |
| 32 | Threat | -1.1133 |
| 3 | Conflict and crisis | -1.68819 |

As previously stated, requirements and objectives are a differentiating competency that individuals with perspective three deem significant for opportunity management, "*It is crucial to understand the client's objectives and requirement of the subject opportunity*" (participant 3).

Conflict and crisis management is the least significant competence as "*acting in conflict situations may give opportunities, but in a normal situation, one tries to avoid conflicts, for instance by listening well and strive to fulfil the project objectives*" (participant 1) and "it *would be very strange to have a conflict already during opportunity phase*" (participant 3).

Similarly, the ability to manage threats is unimportant, "*a threat will never be an opportunity*" (participant 4).

Finally, personal integrity is a distinctive characteristic of the third worldview, as it is "*something that is fundament to everything*" (participant 5).

### 5.5.4. Understanding low explained variance

Explained variance in a study is a measure used to distinguish differences between two models. In the Q-methodology explained variance highlights the differences between perspectives. Few researchers use a rule of thumb that the explained variance of all factors combined to be more than 50 per cent (Kraus, 2018; Suprapto, 2015; Tielen et al., 2011). However, no clear reasoning has been provided behind the 50% rule for cumulative explained variance. Cuppen et al. (2010) state that explained variance is not a useful statistic in Q-methodology, but that low explained variance also indicates high variation in ideas and perspectives. They further highlighted that the low explained variation might be related to the topic's complexity and ambiguity. Brown (1980) mentioned that eigenvalues and total variance are generally pointless in Q-methodology research because they rely too heavily on the arbitrary population of data included in the study.

The percentage of variance explained in factor analysis is influenced by the number of variables factor examined, the type of the sample from which data were obtained, sample size, number of factors extracted, and (minimum) number of scale categories applied (Peterson, 2000).

As mentioned above, there could be many reasons for low explained variance. Depending on the reason behind the low explained variance (lack of awareness, ambiguity, the complexity of the topic, low commonalities between individuals or sample size), the results of the Q-methodology might be inconclusive. In case of low explained variance, research suggests grouping participants based on the predefined groups and studying for the difference in opinion (Hengeveld et al., 2021). For this research, project managers and business developers (the predefined groups) were surveyed; therefore, this research also looks into the difference of opinion between project managers and entrepreneurs (Section 5.5.5).

### 5.5.5. Project Managers versus Entrepreneurs

In case of a low cumulative explained variance, explorative subgroups analyses can be carried out (Hengeveld et al., 2021). The main identifiable grouping, in this case, can be done based on the job profile,

i.e., project manager and entrepreneur, and therefore, this research further looks into the comparison between their average Z-scores.

This research looks into the competencies project managers and business developers rated with a difference of more than 0.5. Table 5.10 presents project managers' and business developers' average rating of competencies. At the top of the chart, competencies rated higher by business developers compared to project manager can be found, and at the bottom are the competencies rated higher by project managers than business developers.

*Table 5.10 Average PM and BD competencies rating*
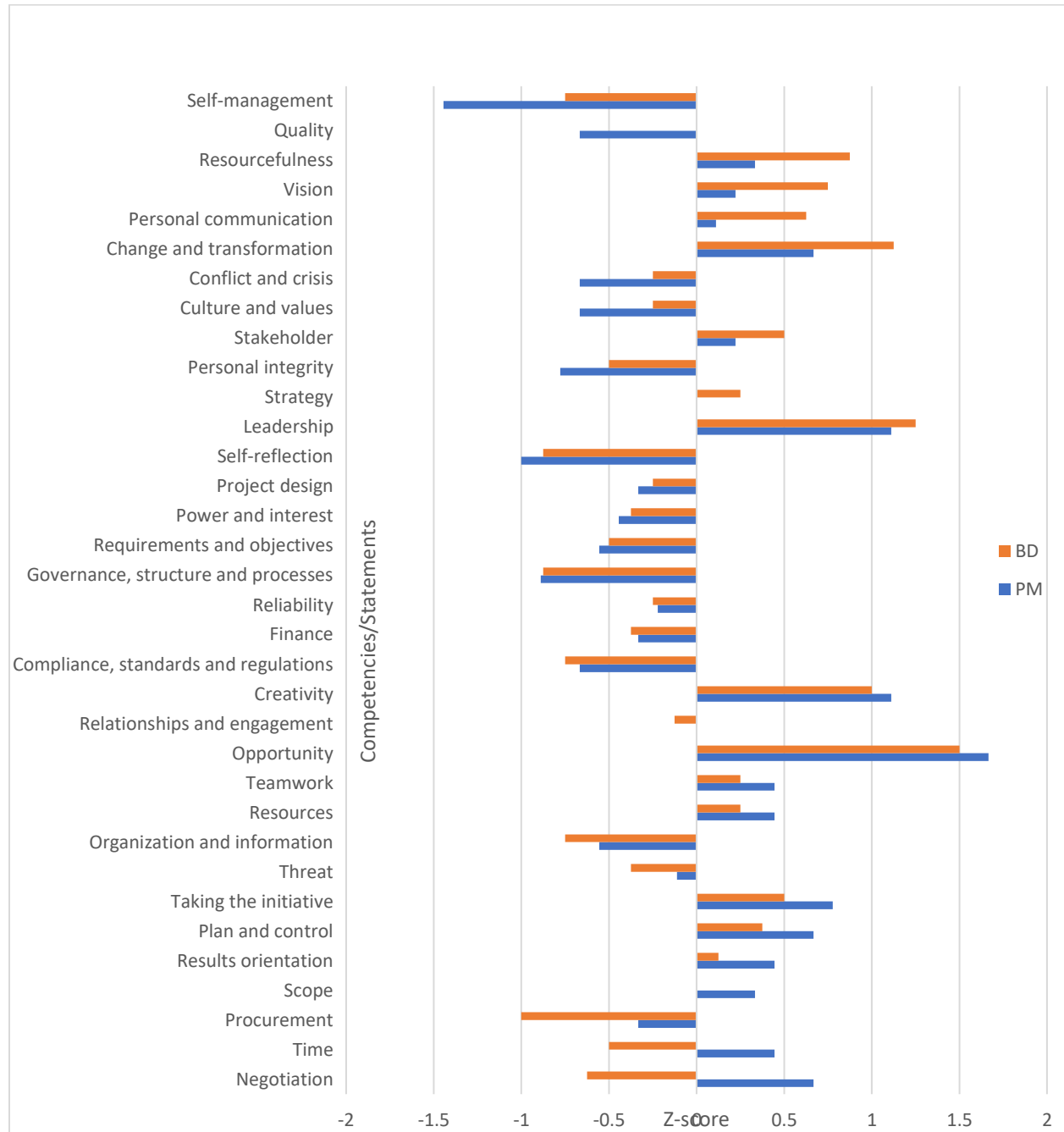
Project managers and business developers rated self-management (s26) and quality (s18) as negative or 0. This indicates that even though there is a difference in opinion, it is on the negative side, i.e., business developer and project manager does not find them important for opportunity management. Further down the list, resourcefulness (s22), vision (s34) and personal communication (s12) are the three with Z-score differences of more than 0.5. Two of these competencies are shared by the project manager and the entrepreneurial list of competencies (s12 and s22), and vision (s34) is an entrepreneurial competence.

On the negative side, three competencies (Negotiation (s9), Time (s33) and Procurement (s16)) were rated more by project managers than business developers, and all of these are pure project management competencies (are not shared by the entrepreneurial competencies list).

### 5.5.6. Commonalities highlighted by all perspectives

As a result of Q-sort, four competencies were common among the perspectives, known as the consensus statements. In other words, participants in all three perspectives similarly rated these competencies. A consensus statement is a statement (here competence) based on which none of the listed factors can be distinguished (Van Exel & De Graaf, 2005).

Opportunity as competence had an overwhelming response, as it ranked +3 in all three perspectives with Z-scores of 2.03 in factor 1, 1.98 in factor 2 and 2.09 in factor 3 (see Table 5.11). The following qualitative data also support it. Participants mentioned it as self-explanatory or as a mandatory competence for opportunity management by saying, "for opportunity management you need opportunity as a competence" (perspective 1, participant 2), "for improving opportunity management opportunity competency is most important" (perspective 1, participant 5), "self-explanatory" (perspective 1, participant 6), "identifying and assessing opportunities can be considered one of the important steps for opportunity management" (perspective 2, participant 4), "identifying and assessing an opportunity is the primary step that defines opportunity management" (perspective 2, participant 5), "opportunity is, of course, important to identify opportunities (perspective 3, participant 1) and "if you are not able to recognize opportunities, you will never take the opportunities" (perspective 3, participant 5).

*Table 5.11 Consensus Statements*

| S. No. | Statement | Factor 1 Z-score | Factor 1 Rank | Factor 2 Z-score | Factor 2 Rank | Factor 3 Z-score | Factor 3 Rank | Over all |
|---|---|---|---|---|---|---|---|---|
| 9 | *Negotiation* | 0.58902 | 1 | 0.57983 | 1 | 0.75104 | 1 | 1 |
| 10 | *Opportunity* | 2.03423 | 3 | 1.97742 | 3 | 2.0895 | 3 | 3 |
| 17 | *Project design* | -0.18936 | 0 | -0.6368 | -1 | -0.33863 | -1 | -1 |
| 23 | *Resources* | 0.38889 | 0 | 0.78502 | 1 | 0.24943 | 0 | 1 |

All other consensus statements, i.e., Negotiation, Resources, and Project Design, were rated in the middle, and therefore, insufficient qualitative data was gathered to provide clear reasoning for their explanation.

This research further looks into the average Z-score of all participants combined. Figure 4 highlights the average Z-scores of all competencies. As mentioned at the beginning of this section, all participants on average rated opportunity competence as the most important, and the same can be witnessed in Table 5.12. Further, it can be noticed that 6 out of 7 highest mentioned competencies are either entrepreneurial

competencies or shared competencies of project managers and entrepreneurs. The overwhelming number of highest entrepreneurial competencies suggests the importance of entrepreneurial competencies for opportunity management.

*Table 5.12 Average Z-score of all participants combined*

*Description: The following table presents the average rating for the importance of competencies for opportunity management. This includes all survey participants, i.e. project managers, business developers and individuals with both roles. Therefore, it cannot be directly compared to Table 5.10. Competencies with a positive Z-score are considered important for opportunity management, whereas competencies with negative Z-score are rated as not important.*
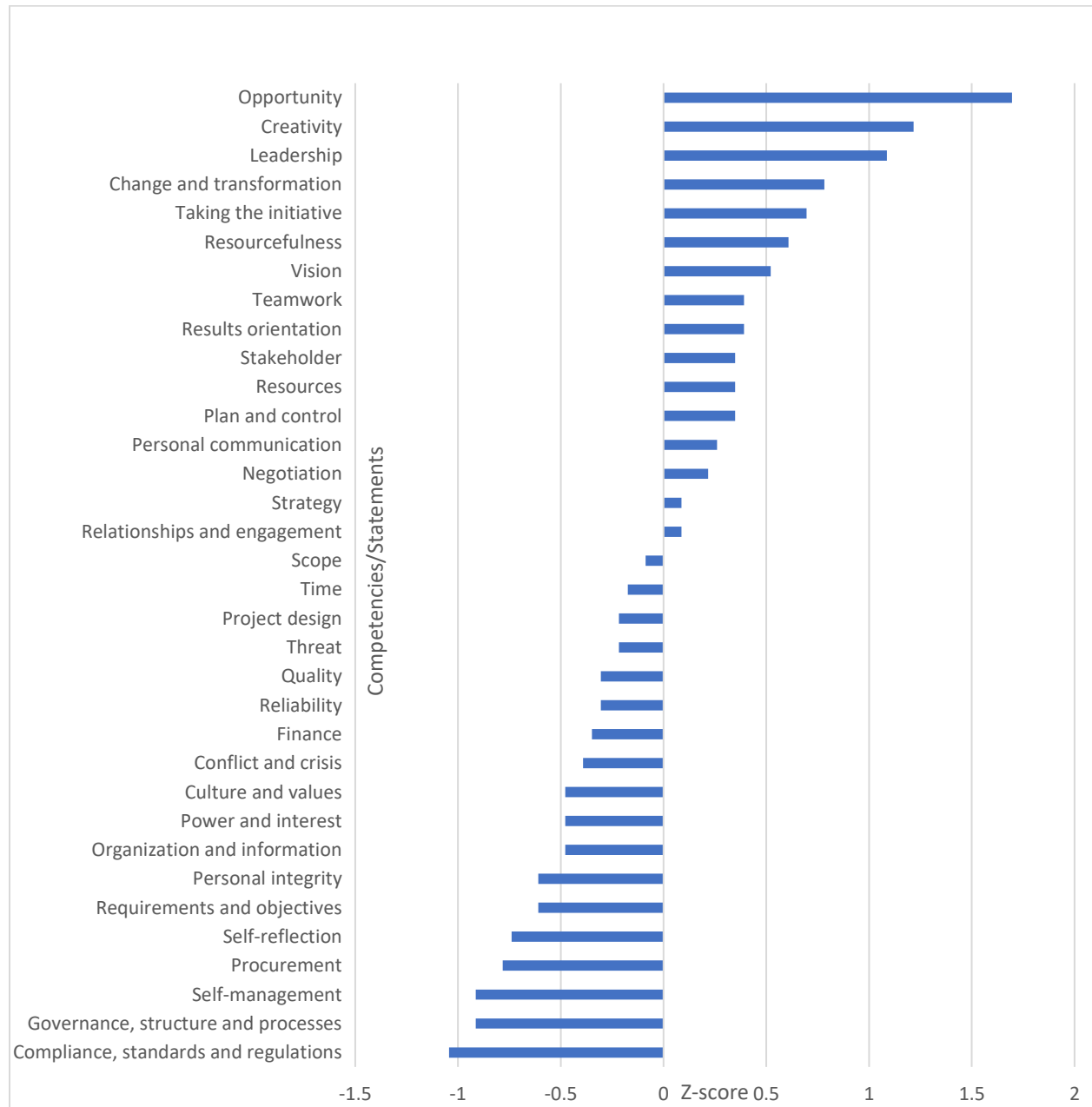
The top three competencies (Opportunity (s10), Creativity (s4) and Leadership (s8)) can be considered significant for opportunity management, as they have a higher Z-score of more than 1.0. That means the majority of participants have rated these competencies highly positive.

Opportunity is an element that enables a person to recognise and manage opportunities, including responses and overarching strategy. The ability to analyze an opportunity's likelihood and impact, choose a suitable strategy, and carry out the prepared response to manage the opportunity are also included.

Creativity is the ability to discover a number of approaches and possibilities to provide value, including better solutions to both old and new problems. It also entails experimenting with novel strategies and effectively synthesizing information from several fields to produce meaningful opportunities.

Leadership is the third most crucial competency and is described as the capacity to give guidance and direction to others. It also encompasses using various management concepts depending on the circumstance to inspire and improve team performance.

Out of all the least important competencies found in the survey only one has a Z-score of more than 1.0 and two others with a Z-score close to 1.0. Also, project managers and entrepreneurs negatively rated the least three rated competencies. This means that both showed their consensus for the three least rated competencies (Compliance, standards and regulations (s2), Governance, structure and processes (s7), and Self-management (s26)).

## 5.6.    Conclusion

This chapter uses the Q-methodology to determine project managers' and entrepreneurs' perspectives on the competencies required for opportunity management. As a result, an understanding of the differences in the perspectives of Royal HaskoningDHV employees is acquired. The perspectives are determined by sorting the statements of the Q-set, by 23 selected participants from Royal HaskoningDHV. The statements represent the project management and entrepreneurial competencies. Three groups are identified from the collection of 21 individual perspectives (2 individuals did not have sufficient commonality with any of the identified perspectives) that have similar views on the importance of competencies important for opportunity management. The third sub-question can be addressed by combining the information from the earlier parts.

***SQ3: To what extent do project managers and entrepreneurs have different views on individual competencies for opportunity management?***

The study of perspectives resulted in low cumulative explained variance (42%); and the three identified perspectives did not provide a complete picture. There could have been many reasons behind low explained variance, such as low commonalities between participants' perspectives. This means further investigation is needed before making any conclusions from perspectives. Therefore, the perspectives were not studied further. Rather commonalities and differences between views of project managers and entrepreneurs on importance of competencies were studied.

These are the competencies that overall rated highest or lowest:

- Opportunity (s10), Creativity (s4) and Leadership (s8) are the most important competencies for opportunity management.
  - Opportunity is an element that enables a person to recognise and manage opportunities, including responses and overarching strategy. The ability to analyze an opportunity's likelihood and impact, choose a suitable strategy, and carry out the prepared response to manage the opportunity are also included.
  - Creativity is the ability to discover a number of approaches and possibilities to provide value, including better solutions to both old and new problems. It also entails experimenting with novel strategies and effectively synthesizing information from several fields to produce meaningful opportunities.
  - Leadership is the third most crucial competency and is described as the capacity to give guidance and direction to others. It also encompasses using various management concepts depending on the circumstance to inspire and improve team performance.
- Compliance, standards and regulation (s2), Governance, structure and processes (s7) and Self-management (s26) were found to be the least important competencies.

Business developers find their competencies to be more important than the project manager's competencies (Vision (s34), Resourcefulness (s22) and Personal communication (s12)). So, learning about opportunity management would mean including these entrepreneurial competencies and expanding the list of project management competencies to improve opportunity management. On the other side, project managers also found their competencies to be more critical than entrepreneurial competencies. They found negotiation (s9) and time (s33) more important (rated positively with a lower Z-score) than entrepreneurs (rated negative). Compliance, standards and regulations (s2) & Governance, structure and processes (s7) had the lowest average rating. The high negative rating indicates that these competencies do not play any role in improving opportunity management.

# 6. Expert Consultation and Implementation

The Q-analysis provided insight into project managers' and business developers' opinion on individual competencies that are important for opportunity management, and the outcomes were identified based on those findings. In this chapter, expert consultations on the findings of Q-analysis are presented and analysed. Section 6.1 is on the setup of expert consultation, Section 6.2 provides the findings, and Section 6.3 answers the fourth research question.

## 6.1. Expert consultation interview setup

The main goal of the expert consultation is to evaluate the results discovered in various sections of this research. Expert consultation was carried out as individual consultation due to limited availability, time constraints, and to avoid social influence. Three experts from the Project Management knowledge group of Royal HaskoningDHV were consulted. As the name suggests, the knowledge group is a team of experts interested in project management and finding ways to improve project management at Royal HaskoningDHV. All three experts have more than ten years of industry experience. Based on the expert knowledge and experience, the findings were discussed in two parts: identified commonalities and differences between the opinion of project managers and business developers. As the survey was conducted within the Royal HaskoningDHV, the results are examined by experienced employees of Royal HaskoningDHV. Any individual involved in previous steps of this research was not included to prevent bias.

## 6.2. Expert consultation findings

In the consultation, session experts were asked to give their opinion on the findings from the survey. At first, three questions on the identified commonalities were asked, which were followed by three questions on differences.

### 6.2.1. Commonalities in perspectives

As mentioned in chapter 5, overall Opportunity (s10), creativity (s4) and leadership (s8) were the three highest-rated competencies. All three experts recognised the importance of the top three competencies (Table 6.1). As one of the experts mentioned, "Opportunity is defining it", "You have to think outside the box when defining opportunities. So, definitely creativity is important", and "Leadership is important as even after identifying opportunities, you have to take control and exploit them".

*Table 6.1 Expert view on most important competencies for Opportunity Management*

| Most important competence for OM | Expert 1 | Expert 2 | Expert 3 |
|---|---|---|---|
| S10: Opportunity | Agreed | Agreed | Agreed |
| S4: Creativity | Agreed | Agreed | Agreed |
| S8: Leadership | Agreed | Agreed | Agreed |

The three least essential competencies were Compliance, standards and regulations (s2), Government, structure and processes (s7), and Self-management (s26). As shown in Table 6.2, all three experts agreed on the negatable importance of Compliance, standards and regulations (s2) and Government, structure and processes (s7). Whereas two experts did not agree with self-management (s26) and mentioned, "If you want to be creative and have a leadership role, you have to do self-management" (expert 1) and "when you are too busy in work and do not do self-management, it could lead to neglecting opportunities as they are not a requirement" (expert 2). Expert 3 mentioned self-management (s26) and said, "it is very important in general but not very relevant to opportunity management".

*Table 6.2 Expert view on least important competencies for Opportunity Management*

| Least important competence for OM | Expert 1 | Expert 2 | Expert 3 |
|---|---|---|---|
| S2: Compliance, standards and regulations | Agreed | Agreed | Agreed |
| S7: Government, structure and processes | Agreed | Agreed | Agreed |
| S26: Self-management | Do not Agree | Do not Agree | Agreed |

Following the most and the least essential competencies, participants were asked if they found any other competencies necessary enough that they should be placed in the top three. Expert one highlighted the importance of creating an environment which allows fostering opportunities. Expert two mentioned Resources (s23) as "managing resources in a better way could yield some opportunities" and Time (s33) as "you need to have time to think about opportunities". Expert three mentioned three competencies which were negatively rated, i.e. Requirements and Objectives (s21) and Culture and values (s5) and Finance (s6), by mentioning "for the opportunity also, you need to be considering the objective of the project and create opportunities that align with the objective of the project", "The culture of the project and the value of clients and Royal HaskoningDHV are important, as you will investigate the opportunities in that direction" and "finance is the incentive as you are trying to make more money from those opportunities". However, these were individual suggestions and therefore needed to be studied further before making a conclusion.

*Table 6.3 Other highlighted competencies by experts*

| Expert 1 | Expert 2 | Expert 3 |
|---|---|---|
| Creating a safe environment | S23: Resources<br>S33: Time | S21: Requirements and Objectives<br>S5: Culture and values<br>S6: Finance |

### 6.2.2. Comparison between Project Manager and Business developer perspectives

Looking at the three most differently rated (positively and negatively) competencies, experts were asked if they could think of the reasoning behind the difference in opinion of business developers and project manager. All three experts agreed and did recognise the difference in perspectives. Expert 1 mentioned the competencies that business developers rated higher are "useful in the front-end development of a project" and "in that phase, you need to have an open mind and think outside the box". Similarly, expert 2 also mentioned that the "Business developer's job is to think out of the box, and I guess that is why they rated them higher". Expert 3 mentioned, "All of the things that Business Developers rated higher are part of their

phase, so project manager does not have to deal with it, and therefore they do not find them important". This suggests that different competencies are required in different phases of a project.

Further in the interview, experts were asked whether there is a need to expand the project management list of competencies and include entrepreneurial competencies. Two out of three experts did not agree and hinted toward a different solution. Expert 1 said, "I do not believe in project managers who can do anything and everything", but rather "team up with Business Developer and integrate their skills". Expert 2 mentioned, "normally we are doing our project at the last moment, so we cannot go back and think about creativity and that limits our ability. So, maybe learning those competencies helps in some limited cases, but other constraints limit our ability." Expert 3 had a different view and mentioned that "it is always useful to have the two roles connect, share the competencies or capabilities". All of these answers also hint toward the last question of the interview.

The last question was based on a notion generated from the exploratory surveys. Interviewees were asked if they saw any issues in the handover of a project from a business developer to a project manager and if the involvement of the project manager early on in the process could help. All three experts showed their consensus. Expert 1 mentioned, "they are (referring to Project Managers and Business Developers) living in their own bubble, so when they really start connecting, they could do better. Business Developers should remember that someone else needs to follow through on what he has discovered. Furthermore, phrase it and frame it such that someone can pick it up". Expert 2 mentioned, "project manager is involved at a stage where they try to manage risk and get the job done, but they do not have enough possibility to explore opportunities. Project Managers involvement in early-stage could be helpful,". And expert three mentioned, "We can learn a lot from each other. Business Developers also do not consider the small details of how Project Managers work, and they do not include that in their plan, which leads to unrealistic opportunities or unrealised gains."

## 6.3. Conclusion

The project manager and business developer's perspectives on the importance of individual competencies for opportunity management highlighted some key discoveries. This chapter studied commonalities and differences between the project manager and business developer and validated them. During the expert consultation, experts were asked to evaluate the findings on the interviews and surveys in order to answer sub-question 4:

*SQ4: How do the expert views relate to the survey findings for improving opportunity management?*

Experts recognised all three overall most rated competencies (Opportunity (s10), Creativity (s4) and Leadership (s8)) and two least rated competencies (Compliance, standards and regulation (s2), Governance, structure and processes (s7)). Nevertheless, experts highlighted that they did not find Self-management (s26) as one of the least important competencies for opportunity management; instead, they found self-management crucial to opportunity management. Furthermore, experts also highlighted other competencies that they found comparatively important but were poorly rated, i.e., Resources (s23), Time (s33), Requirements and objectives (s21), Culture and values (s5) and Finance (s6).

Experts also recognise the difference in views of project managers and business developers on importance of competencies for opportunity management. In general, they highlighted that the difference in views is

related to the phase of involvement of project managers and business developers. For example, business developers - who are involved in a project's conceptualisation phase - found competencies such as Resourcefulness (s22), Vision (s34) and Personal communication (s12) more important for opportunity management. Whereas project managers - who mainly get involved in a project after fixing the scope - found competencies such as Negotiation (s9), Time (s33) and Procurement (s16) more important for opportunity management.

Two out of three experts did not show their consensus on the idea of an expanded project management competencies list (including entrepreneurial competencies), instead highlighted having a handover problem. The handover of a project from business developers to project managers was one of the critical notions identified in the literature review and exploratory interviews. When experts were asked about involving project managers early on in the conceptualisation phase of a project (to reduce the handover-related issues), all three experts agreed and mentioned that it would be beneficial.

# 7. Discussion

This chapter first untangles the results and findings in Section 7.1 and discusses results in connection to the barriers in Section 7.2. Followed by that section 7.3 presents the limitations of this research. Then, based on the results, practical recommendations for project management are made in 7.4. At last, this chapter concludes by providing practical recommendations for future research (section 7.5).

## 7.1. Discussion of the results

This research aimed to discover ways to improve practising opportunity management by studying individual competencies and learning about critical competencies essential for opportunity management. This is an exploratory study on the importance of competencies for opportunity management. In previous studies, the importance of competencies has not been examined from the standpoint of project managers and business developers for opportunity management. Therefore, the study's results are novel and cannot be one-on-one compared to earlier studies.

It was discovered that the project managers' and entrepreneurs' type of project does not relate to their views on the competencies required for opportunity management. Instead, it was realised that the viewpoint differs vastly regardless of the project size, complexity, duration, team size, and parties involved in their projects.

Q-methodology was deployed to determine perspectives, but the Q-analysis resulted in low cumulative explained variance. Three perspectives were identified with 25%, 10%, and 6% explained variance. Low variance also shows high variation in ideas and perspectives (Cuppern et al., 2010). Analysis of the data set revealed that individuals under each perspective did not show high commonalities, which means the diversity of opinion could have yielded low variance. The diversity in opinion can occur due to ambiguity, complexity and lack of knowledge about opportunity management (Cuppern et al., 2010). Research suggests grouping participants based on the predefined groups and studying for the difference in opinion (Hengeveld et al., 2021). Therefore, this research further studied the differences between project managers and business developers.

Further, commonalities and differences between the perspectives of project managers and entrepreneurs were studied. Competencies which were overall rated highest are Opportunity (s10), Creativity (s4) and Leadership (s8). It is noticeable that all three of these competencies are either entrepreneurial competencies (Creativity (s4)) or shared competencies of entrepreneurs and project managers (Opportunity (s10) and Leadership (s8)). All experts also agreed on the importance of the top three competencies. It was noticed that 6 of the seven most rated competencies are entrepreneurial or shared competencies. From the literature review, it was noticed that many researchers created a link between opportunity management and entrepreneurship (Cook, 2017; Di Muro & Turner, 2018; Fangel, 2018; Short et al., 2010; Timmons et al., 2004). The links presented in the literature, combined with hightailed entrepreneurial competencies, further strengthen the notion of the importance of entrepreneurial competencies for opportunity management and highlight that project managers also largely agree on the importance of these entrepreneurial competencies.

The difference between the predefined group, i.e. project managers and entrepreneurs, were studied. One study in the literature review suggested that entrepreneurs are good at discovering opportunities, whereas project managers are good at exploiting opportunities (Choi and Shephard, 2004). Therefore, this research further finds differences in the opinion of project managers and entrepreneurs regarding competencies which are essential for opportunity management. As the sample size was insufficient for statistical analysis (9 project managers and eight entrepreneurs), competencies with more than 0.5 differences in Z-score between project managers and business developers were studied. Experts were asked about the underlying reasoning behind the differences in views of project managers and business developers on the importance of competencies. They highlighted that: (1) It is due to their involvement in different phases and (2) due to differences in the role they play in a project. Business developers are involved in the conceptualisation period of a project and find resourcefulness (s22), vision (s34) and personal communication (s12) more important. In contrast, project managers are involved after the conceptualisation and in the project's execution phase and find Negotiation (s9), Time (s33) and Procurement (s16) more critical.

In exploratory interviews, interviewees highlighted that the discovered opportunities by business developers were not exploited properly by project managers. The issue with the handover of business opportunities was investigated in conjugation with differences in views. Experts suggested that the involvement of the project manager in the conceptualisation phase of a project (with the business developer) could help overcome the issue with the handover of opportunities. Such involvement of project managers in the conceptualisation phase will also provide an opportunity to learn from each other's roles (project manager and business developer) and behaviour regarding opportunities management. It will also increase coherence between the project manager and the business developer.

Another reason behind the differences in opinion of project managers and business developers is their roles. Project managers' focal point is to get the desired output from a single project. In contrast, business developers' focal point is to create the organisation's business to deliver on organisational goals. This issue was not discovered at the beginning of this research; therefore, this research further investigates potential solutions to this issue by looking into the literature.

Comninos & Frigenti (2002) provide the "wrappers model" framework for moving project managers' focal points to business-focused. Using this framework, project managers can move their focal point from time, budget and functionality of deliverables to organisational goals, objectives, strategy, stakeholder satisfaction and business results. The wrapper model consists of four layers: Firstly, the strategic wrapper (outermost layer) is about the organisational strategy, where the organisational strategy (including vision, mission, goals and objectives) provides a direction to the business wrapper. Secondly, the business wrapper is based on the organisational strategy and consists of proposal prioritisation, sectional and, at last, project portfolio. Thirdly, a project portfolio leads to a particular project, where project managers initiate the project and plan, monitor and evaluate it. Lastly, the core layer, i.e. ODPM, is the essential layer. ODPM stands for **objective-directed project management**, which refers to the combined steps, tools and techniques resulting in the business and strategic wrapper. This approach integrates project deliverables with the organisational strategy. ODPM is also about creating an environment where everyone on a project is aware of the project deliverables in conjugation with the organisational strategy. To make the wrappers a helpful framework, one must also evaluate a project in different terms, such as client satisfaction, market share, learning and development of the organisation.

The project manager can foster opportunities in alignment with the project portfolio, and opportunities in the direction of the project portfolio will help deliver portfolio benefits. A culture for fostering opportunities can be developed by focusing on organisational benefits by targeting portfolio benefits.
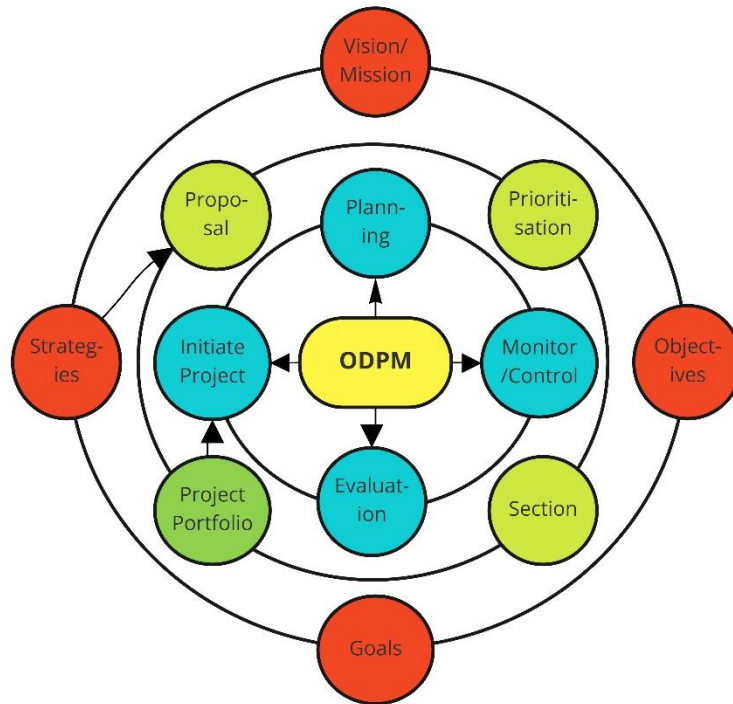


*Figure 6 Wrappers Model (Comninos & Frigenti, 2002)*

## 7.2.  Discussion on the barriers

In the literature review chapter, this research discussed the barriers to practising opportunity management (OM) and investigated them further in exploratory interviews. As mentioned in chapter 4, this research focuses on dealing with four barriers (Ignorance, Language, Culture and Psychology) identified by Hillson et al. (2019) and four barriers (Lack of awareness, Human nature & mindset, Lack of clear structure process for OM and Lack of collaboration between different disciplines) identified by Massaad (2021). Other barriers were left out of the scope of this research, as they are related to external factors. Table 7.1 presents the solutions to those barriers. The solutions are framed based on the findings from different parts of this research. This table acts as a bridge between the findings of this research and barriers to opportunity management. The research was based on the argument that following barriers can be overcome by developing competencies, but it is realised that competencies alone will not help. In addition to competencies, one must also focus on the job profile and the coherence between the business developer and project manager to overcome the barriers. Barriers, such as a lack of clear structure and process, can be curbed by increased coherence between project managers and business developers.

*Table 7.1 Solutions to Barriers of Opportunity Management*

| Barriers | Solution |
|---|---|
| **Ignorance** | Opportunity (s10) as competence is the ability to discover and identify opportunities. Therefore, the ignorance barriers can be reduced by educating practitioners about opportunity management. Once an individual learns about opportunity management and develops it as a competence, they will be able to overcome this barrier. |
| **Language** | 2 out of 4 interviewees rated the Language barrier low, and 3 out of 4 mentioned that it does not play a significant role. Therefore, this barrier was not studied further. |
| **Culture** | It is mentioned in EntreComp that a part of developing the competencies of spotting opportunities (s10) is also to promote a culture for spotting opportunities (McCallum et al., 2018). Therefore, developing that opportunity (s10) as competence could help overcome this barrier. |
| **Psychology** | Massaad (2021) describes the human nature & mindset barrier as human psychology focusing more on negative or downsides. Therefore, this barrier is considered same as human nature & mindset, and hence the solution to this barrier is discussed under human nature & mindset. |
| **Lack of awareness** | The lack of awareness about opportunity management can be improved through education (Massaad, 2021). As mentioned earlier, to improve opportunity management, one needs to be good at Opportunity (s10) as a competence. In addition, developing an ability to spot and exploit opportunities can raise the awareness and importance of opportunity management (McCallum et al., 2018). |
| **Human nature & Mindset** | When asked about the mindset required for opportunity management, practitioners in the exploratory interviews mentioned that project managers must be brave, comfortable with the client and willing to take risks. However, these competencies relate to personality traits, such as openness to experience and extraversion (Choi & Shephard, 2004). Therefore, one must work on the personality traits mentioned above to overcome this barrier. In addition, creativity (s4) could also help foster change in mindset by making project managers aware of the organisational strategy, and portfolio benefits and increasing interaction with business developers. |
| **Lack of a clear structured process for OM** | Two issues related to this barrier were found in exploratory surveys, i.e. Risk management system limiting practitioners' ability and handover issues between the business developer & project manager. This research recommends that Royal HaskoningDHV should rethink its risk management system and allow practitioners to be creative. Secondly, to deal with handover-related issues, it is advised to increase the coherence between project managers and business developers by making them aware of the organisational strategy and portfolio benefits and business developers aware of project managers' focal points. |

| Lack of collaboration between different disciplines | In exploratory interviews, none related to lack of collaboration between different disciplines was mentioned by any interviewees; therefore, this barrier was not studied further. However, Mobilising others' (Leadership) competence also highlights the ability of an individual to create a collaborative environment to foster opportunities (McCallum et al., 2018). Mobilising others might not help entirely, but developing this competence might help suppress this barrier also. |
|---|---|

## 7.3. Limitations of this research

This study's methodology provided insight into opportunity management and its connection with project managers and entrepreneurial competencies. However, the study has certain limitations, which are as follows:

**Data gathering**

- All interviewees and workshop participants were colleagues from Royal HaskoningDHV, an engineering consulting firm. Consequently, performing similar surveys and interviews with professionals from a contractor's or client's side, and perhaps another consultant business, may provide different results due to different perspectives.
- The outcomes of this project are based on the viewpoints of the people who participated in various aspects of the process. This is a limitation since there are numerous possibilities (other than those that were involved) for which participants filled in the surveys and how they replied to the questionnaire.
- Business developers were chosen to represent entrepreneurs as this research involved individuals from Royal HaskoningDHV. As mentioned before, the business developer's role at Royal HaskoningDHV is to create new business opportunities and exploit them. This is similar to an entrepreneur's role but not identically similar. Therefore, this act as a limitation to this research.

**Limitations on findings**

- Q-analysis resulted in 42% cumulative explained variance, which could mean either the results from Q-methodology are inconclusive, identified competencies are incomplete (more perspectives could have been identified), or the topic is ambiguous. Analysis of the explained variance is critically dealt with in section 5.5.4.
- The findings of this study were not evaluated in practice to determine or establish their usefulness. The results were validated by three experts outside the questioned group using selection characteristics derived. Even after expert validation, it is impossible to determine whether the provided solutions, such as important competencies for opportunity management, are effective when used in a real-life context. Testing these results on many projects and with multiple project managers might be beneficial.
- The literature review and exploratory interviews showed many barriers to opportunity management, but this research only focuses on individual competencies and organizational barriers. Participants in all three empirical stages of the study highlighted other barriers to opportunity management. Other barriers related to external factors were not studied.

## 7.4. Practical recommendation for Project Management

This section presents information regarding the practical recommendations that Royal HaskoningDHV can use. As all of the empirical data is collected from Royal HaskoningDHV, the findings of this research do not provide an industry-wide overview. However, contrary to that, the findings would perfectly work for Royal HaskoningDHV. Other organisations can also try and test the practical recommendations presented in this report.

- Interviewees highlighted the importance of work culture for working on opportunities. Therefore, it is recommended that Royal HaskoningDHV works on creating an organisational culture to foster opportunities. This could be achieved by showcasing a positive attitude towards risks and asking professionals to create opportunities from those risks.
- For project managers, it is recommended to develop Opportunity (s11), Creativity (s4) and Leadership (s8) competencies, as these competencies were found critical and could help them become better at opportunity management. However, these competencies are also vague, and they also cover a large number of interrelated competencies. For achieving these competencies, the EntreComp framework can be used. EntreComp framework application would require further research to device practical steps for attaining these competencies. Following are the initials steps recommended to develop these competencies:
  - Opportunity: First, project managers need to be aware of the theory of opportunity management. Educate professionals about risks, threats and opportunities. Furthermore, knowledge about opportunity management should be used to align project goals with organizational strategy and portfolio benefits.
  - Creativity: Project managers must look into organizational strategy and portfolio benefits to discover opportunities and work in that direction. The project manager also must create a safe environment where the entire team feel comfortable pitching for potential opportunities. Project managers should create an environment where individuals working in the isolated team gets to interact and share ideas with individuals from other disciplines.
  - Leadership: Project managers acting in the leadership position of a project must foster an environment where the entire team is encouraged to come up with potential opportunities. Project managers should increase the awareness about opportunity management, organisation strategy and portfolio benefits within their team. Project managers also have to be proactive and take the lead by communicating potential opportunities from their team to the client.
- Participants in the exploratory interviews mentioned about the present risk management tool used at Royal HaskoningDHV. The present system first asks if a similar project was done previously and the works based on that. It restricts practitioners' ability to try and think out of the box. Therefore, it is recommended that Royal HaskoningDHV thinks about the possible changes that could be made in the present risk management system that could provide practitioners more freedom and promote creativity in the process.
- Furthermore, it is recommended that Royal HaskoningDHV improves handover from business developers to project managers. Sometimes the defined business opportunities are unrealistic and therefore result in project failure. This issue can be resolved by early involvement of project management in the conceptualisation phase of a project and business developers in the starting phase of execution of a project.

- Finally, project managers should foster opportunities in alignment with the project portfolio to deliver towards portfolio benefits and, consequently towards, organizational strategy. A culture for fostering opportunities should be developed by focusing on organisational benefits by targeting portfolio benefits.

**The implication of the most important Competencies**

This research further uses the framework provided by the EntreComp into action for developing a strategy to improve opportunity management. As an entrepreneur's role is similar to opportunity management (create and exploit business opportunities), this research finds the already developed EntreComp into action framework more helpful in developing these competencies (McCallum et al., 2018). This framework is already tested and found helpful for creating and exploiting opportunities. The framework breaks each competence into a few threads to develop the core competence (see Table 7.2). Links to some of these threads were also found in surveys (which are presented next to the threats explanation). This research recognizes the vague and broad nature of the threads under competencies and suggests further research to devise practical steps, testing them to understand this framework's implementation better.

*Table 7.2 Threads of most important competencies (McCallum et al., 2018).*
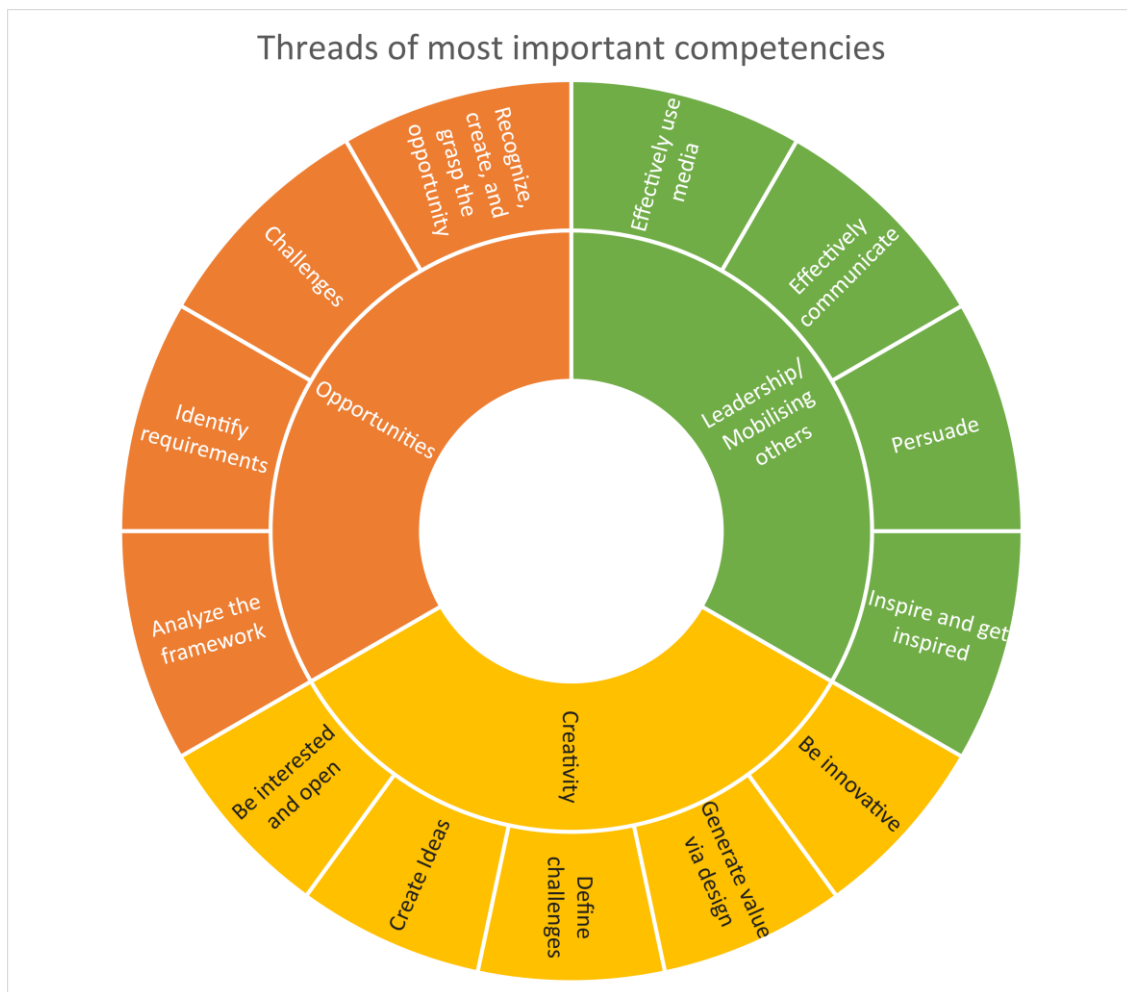
*Opportunities/spotting opportunities:* Explore the social, cultural, and economic context to identify and grab opportunities to create value. Determine the needs and obstacles that must be addressed. Develop new connections and bring various components of the environment together to generate chances for value creation.

1. **Recognize, create, and grasp the opportunity:** Developing the capacity to appraise chances for value creation and determine whether to pursue them; and the ability to detect and swiftly capitalize on an opportunity. Participant 3, from perspective 2, also mentioned the opportunity as it is essential to identify and analyse the opportunity that adds value to the project. Further, participants 4 and 5 from perspective 2 mentioned that "identifying and assessing the opportunity is important".

2. **Challenges:** Developing the capacity to cluster multiple possibilities or uncover connections among different opportunities to maximize their value and create opportunities where they can maintain an edge over their competitors. Interviewee 1 in the exploratory interview mentioned that "everyone has their agenda and they try to look out for opportunities in their agenda" and added, "to improve opportunity management, we need to have someone connecting the dots".

3. **Identify requirements:** Improving their capacity to construct a "roadmap" that links needs with the steps required to address them, allowing them to generate value and design initiatives that anticipate future needs.

4. **Analyze the framework:** Developing the capacity to track recent developments and see how they generate threats and new ways to develop value, as well as promoting a culture within their organization that is open to detecting weak signals of change, which leads to new opportunities to develop value.

*Creativity:* Create many ideas and chances for value creation, such as improved solutions to current and new difficulties. Investigate and test out novel techniques. To produce positive results, combine knowledge and resources.

1. **Be interested and open:** Developing the capacity to actively seek out new solutions that increase the value-creation process, as well as combining their expertise in many settings to transfer knowledge, ideas, and solutions across diverse domains.

2. **Create Ideas:** Develop the capacity to customize various methods of involving stakeholders to the demands of their value-creating activity, as well as establish new procedures to include stakeholders in the generation, development, and testing of value-creating ideas. For example, participant 5 from perspective 1 mentioned, "creative ideas are very important for creating new opportunities.

3. **Define challenges:** Developing the capacity to deal with challenges, manage and execute a creative project, and apply various creative strategies to generate value throughout time.

4. **Generate value via design:** Develop the capacity to apply various design techniques to construct value through new goods, processes, or services, as well as design and produce creative ways to create value.

5. **Be innovative:** Developing the potential to recognise the steps required to research the possibility of an innovative idea in light of its progression into an existing project, a new venture, or a social change opportunity; and the ability to manage a design process that responds to emerging needs and capitalize on opportunities as they arise.

*Leadership:* Leadership is more than just mobilising others; IPMA ICB 3.0 (2018) provides a complete definition of leadership. However, this complete definition was not used while doing Q-sort. The definition which resulted in leadership rating higher was almost similar to the definition of Mobilising others in EntreComp. Therefore, the framework provided by Entrecomp is used.

*Leadership/Mobilising others:* Motivate and excite key stakeholders. Get the help you need to reach your goals. Effective communication, persuasion, negotiation, and leadership are required.

1. **Inspire and get inspired:** Develop the ability to keep enthusiasm with their team, partners, and stakeholders in the face of adversity and to develop coalitions to transform ideas into action. Participants under the first perspective mentioned "good leadership will encourage entire team to highlight opportunities" (participant 3) and "leadership is important to motivate others and create more opportunities.
2. **Persuade:** Developing the capacity to generate a call-to-action that enlists internal stakeholders such as coworkers, partners, employees, or senior managers, as well as the negotiating power support for value creation initiatives. Participant 9 form perspective 1 mentioned "team and stakeholders should be willing to think about and accept opportunities".
3. **Effectively communicate:** Develop the capacity to engage in constructive dialogues with the community that their proposal is aimed at and persuade all key stakeholders to take responsibility for acting on a value creation opportunity. Participant 2 perspective 2 highlighted the importance of leadership as providing guidance and planning to keep the project on schedule.
4. **Effectively use media:** Developing the capacity to design a communication plan to mobilize people around their value-creating activities and get support for their vision. No comments were made by participants relating to use media effectively.

It can be noticed that all of the threads were addressed or mentioned in surveys and therefore, this research further recommends testing the framework.


## 7.5. Recommendations for the future research

- This research identifies critical competencies for opportunity management, but the highlighted framework is not tested. Therefore, research on the practical implementation strategy of identified competencies critical for opportunity management should be done.
- From the literature study and in conjunction with the empirical data gathering, it was noticed that individuals doing project management might not have adequate knowledge about opportunity management. Therefore, a study can be conducted to find innovative ways to educate project managers about opportunity management.
- This research identified competencies for opportunity management. The literature study highlighted that opportunity management combines discovering and exploiting the opportunity. An independent study can be conducted to identify the barriers to discovering and exploiting opportunities separately. Furthermore, the study of competencies can also be extended by studying the differences in competencies to discover and exploit opportunities.
- This study provides practical recommendations to help practitioners become better at opportunity management. The main question here is how much the individuals, organisations and, on a larger scale,

industries are willing to change. Therefore, this study could be extended with literature on barriers to individual behavioural change and see how the leadership of corporate management could help improve the skillset and mindset of individuals towards opportunity management.

- A limitation of this research is that all the inputs came from participants of an engineering consultancy firm. This research could also be extended to include insights from other types of organisations, such as contractors and clients. Exploring their idea could lead to different results (additional perspectives). Furthermore, the entrepreneurs' role was played by the business developers from Royal HaskoningDHV, as their job is to create and exploit business opportunities. Therefore, including entrepreneurs outside of Royal HaskoningDHV could yield different results.

# 8. Conclusion

This study aimed to understand the subjectivity of project managers' and entrepreneurs' views on the importance of competencies and improving opportunity management. Four sub-questions were developed to answer the main research question, which divided this study into four main parts. At first, a review of the relevant concept from the literature was conducted, such as risk management, challenges to opportunity management and relationship with entrepreneurs. Secondly, an exploratory study was conducted to understand the problem with opportunity management in practice and how learning from entrepreneurs could help. Thirdly, Q-methodology was deployed to identify the commonalities and differences in perspectives of project managers and entrepreneurs towards competencies required for opportunity management. At last, the results from the survey (Q-methodology) were analysed and validated by expert consultation.

## Sub Research Questions

To achieve the research objective, the sub-research question and the research question were answered:

> ***SQ1: What is known about practising opportunity management (OM) in the literature?***

The following three questions were used to answer the first sub-research question:
1. *How is opportunity management in theory different from opportunity management in practice?*
2. *What are the barriers that project managers face when working on opportunities?*
3. *What can we learn from entrepreneurs about opportunity management?*

From the literature, it can be witnessed that the definition of risk management includes both threat management and opportunity management. Whereas in practice, opportunity management is overlooked and project managers shows biased nature towards threats.

Research highlights five barriers to including opportunity management under risk management and seven barriers to practising opportunity management. This research focuses on 8 out of 12 barriers (Ignorance, language, culture, psychology, Lack of awareness, Human nature and mindset, Lack of a clear and structured process for OM and Lack of collaboration between different disciplines) related to individual competencies and organisations. Researchers have highlighted that entrepreneurs are good at discovering opportunities (not exploiting), and project managers are good at exploiting opportunities (not discovering) (Choi and Shephard, 2004). The literature review discovered significant overlap in the personality traits of entrepreneurs and project managers for delivering a successful outcome. The overlap of personality traits of project managers and entrepreneurs strengthens the notion of looking into other competencies overlapping between project managers and entrepreneurs to improve opportunity management. All of the above-mentioned rationales were studied further studied in exploratory interviews.

In a narrow description of entrepreneurs, an entrepreneur's job is to create new business opportunities and exploit those opportunities. These connections between the project manager, opportunity management and entrepreneurs further support the concept of learning from entrepreneurs about opportunity management.

***SQ2: How do the findings from the literature on opportunity management resonate with practitioners?***

Participants indirectly highlighted the importance of personality traits, such as openness to experience and extraversion, when asked about the skillset and mindset required for opportunity management. Participants agreed with most of the barriers to opportunity management, excluding language. Lack of collaboration between different disciplines was also not mentioned. Instead, practitioners highlighted handover-related barriers between the project manager and the business developer. It was mentioned that entrepreneurs sometimes discover unrealistic opportunities, leading to project failure.

When asked about project managers' and business developers' ability to discover exploit opportunities, participants highlighted that project managers are not good at discovering opportunities. The project manager's inability to discover opportunities suggests a lack of competencies. In contrast, entrepreneurs were found good at discovering opportunities.

The above-presented notion, combined with the entrepreneurs' ability to discover and create new business opportunities, provides a direction to include entrepreneurs and entrepreneurial competencies in this study. Therefore, this study combines project management and entrepreneurial competencies to identify the critical competencies for opportunity management.

***SQ3: To what extent do project managers and entrepreneurs have different views on individual competencies for opportunity management?***

The study of perspectives resulted in low cumulative explained variance (42%); and the three identified perspectives did not provide a complete picture. The perspectives were not studied further. Rather commonalities and differences between views of project managers and entrepreneurs on importance of competencies were studied.

Following are the competencies that overall rated highest or lowest:
- Opportunity (s10), Creativity (s4) and Leadership (s8) are the most important competencies for opportunity management.
- Compliance, standards and regulation (s2), Governance, structure and processes (s7) and Self-management (s26) were found to be the least important competencies.

Business developers find their competencies to be more important than the project manager's competencies (Vision (s34), Resourcefulness (s22) and Personal communication (s12)). So, learning about opportunity management would mean including these entrepreneurial competencies and expanding the list of project management competencies to improve opportunity management. On the other side, project managers also found their competencies to be more critical than entrepreneurial competencies. They found negotiation (s9) and time (s33) more important (rated positively with a lower Z-score) than entrepreneurs (rated negative). Compliance, standards and regulations (s2) & Governance, structure and processes (s7) had the lowest average rating. The high negative rating indicates that these competencies do not play any role in improving opportunity management.

Three experts were chosen from the field of project management from Royal HaskoningDHV with more than 10 years of experience in project management. Experts recognised all three overall most rated competencies (Opportunity (s10), Creativity (s4) and Leadership (s8)) and two least rated competencies (Compliance, standards and regulation (s2), Governance, structure and processes (s7)). Nevertheless, experts highlighted that they did not find Self-management (s26) as one of the least important competencies for opportunity management.

Experts also recognise the difference in views of project managers and business developers and highlighted that it is due to the phase of involvement of project managers and business developers. Business developers - who are involved in a project's conceptualisation phase - found competencies such as Resourcefulness (s22), Vision (s34) and Personal communication (s12) more important for opportunity management. Whereas project managers - who mainly get involved in a project after fixing the scope - found competencies such as Negotiation (s9), Time (s33) and Procurement (s16) more important for opportunity management.

The handover of a project from business developers to project managers was one of the critical notions identified in the literature review and exploratory interviews. When experts were asked about involving project managers early on in the conceptualisation phase of a project (to reduce the handover-related issues), all three experts agreed and mentioned that it would be beneficial.

## Main Research Question

Finally, with the help of the answers to the sub-questions, the main research question defined for this research can be answered. The main research question was as follows:

*How can project managers and business developers' views on competencies help improve opportunity management in an organisation?*

This research identified that project managers' and entrepreneurs' opinions about the importance of competencies are not shaped by the size, duration, complexity of a project, team size and number of stakeholders. The perspective study resulted in a low cumulative explained variance, which means the identified perspective does not provide a complete picture of the set of perspectives. Therefore, the analysed perspectives were not further studied, rather the commonalities and differences in perspectives of project managers and entrepreneurs were studied.

It was observed that practitioners in the industry do not have sufficient knowledge about opportunity management, so this research recommends increasing awareness about it. To improve opportunity management, it is helpful to have a common understanding of the concept of opportunity as a positive risk. Furthermore, this study discovered that Opportunity, Creativity and Leadership are the most essential competencies for opportunity management. The EntreComp framework should be used to develop Opportunity, Creativity and Leadership competencies. Entrepreneurial competencies were found more important for opportunity management, and increased coherence between project managers and business developers will help improve opportunity management.

Problem-related to hand over of opportunities was discovered during the exploratory interviews. Some roles in a consulting firm might be related to creating new opportunities. For example, Royal HaskoningDHV Business Developers' role is to create new business opportunities. Typically, the business developer creates a new business opportunity with a set of stakeholders and passes it on to project managers for implementation. However, this sometimes results in lost potential as sometimes the plan is not practically feasible. Bringing the project manager onboard in the conceptualisation phase of a project could remove handover-related issues. In combination with working on these competencies, the project manager can learn and work with business developers. Coherence can also be increased between project managers and business developers by involving project managers in the conceptualisation phase of a project and aligning project goals to organisational strategy and portfolio benefits. In addition, business developers should also remain involved in the initial project execution phase and become aware of the project manager's focal point and the project's practicalities.

# 9. Reflection

Looking back on the completed research, I believe everything went smoothly. The scope of research was novel and therefore came up with some hiccups along the way. Nevertheless, I completed my research within the time frame I had set for myself, and I liked working on it. I anticipated one month delay in the last phase of my thesis and planned accordingly. I enjoyed the empirical component of the study because it allowed me to interact with practitioners and hear their thoughts and experiences.

Every person, in my opinion, is unique and thinks distinctly. I thought subjectivity in a philosophical context to be appealing, thus studied and used subjectivity as a key phenomenon in this research. The views on this topic also proved to be highly subjective, and the empirical investigation produced many ideas, but only a few were included. My supervisors helped me keep my focus on a specific subject at a time. This study collected the opinions of various people, which placed me in a difficult position to draw conclusions and practical recommendations based on the opinions, but my supervisors helped me navigate through that process.

During my investigation, I experienced a few minor setbacks and one substantial issue. The primary issue was with the Q-methodology, which led to findings with low explained variance. If I had the chance to do it over again, I would give my decision more thought. I discovered during my studies that I occasionally made rushed conclusions that later cost me.

The thesis is challenging, as it should be, but these challenges shaped my thinking and helped me develop over time. It was a challenging but fruitful experience, and with the help of my supervisors and friends, I could navigate through it. I developed and worked on my interpersonal and leadership skills. Unlike any other course project, your thesis is your own, and you are in the lead. It comes with freedom and vulnerability. Freedom to choose what is appropriate for your thesis and to be vulnerable to unchartered territory helps you develop interpersonal skills. Moreover, I believe the ability to embrace vulnerability makes a true leader. If you ask me for a piece of advice related to the thesis, I would say discuss it with your supervisors and friends, as most of the issues will be resolved by their involvement.

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# Appendix

# Appendix A: Project Success and Project Management

## A.1. Understanding Project success and Project Management

Project success can be defined differently by different people and organisations and based on the different roles individuals play in an organisation.

The role of project management is not actually to achieve project success, and there is a difference between the role of project manager and project success (Munns, 1996). Project management focuses on delivering the project on time, within the budget, and at a standard quality. Whereas project success might mean different things to the different stakeholders (Davis, 2014). Project management has to do more with controlling the project to fit the requirements and deliver the project. At the same time, project success is based on project lifecycles, which last for way longer than project management.

For example, the construction of a new industrial facility is a project which might take 1-2 years to deliver, but that facility will be operational for 10-20, and the project's success will depend on the goals that the facility can achieve in alignment with the organisation's vision. From the consulting point of view, it also means what all engineering and consulting expertise a company can develop with the help of that particular project. And the project will be a successful one if it contributes to the vision of the company and also helps achieve the company's long-term strategic goals.

Project management focuses on delivering a project with greater efficiency. Now, there is a significant correlation between project success and efficiency, but it is nowhere close to 100% (Correction of 0.36) (Serrador and Turner, 2015). The article indicates that project management by increasing efficiency is a step towards project success, but there are more criteria for project success. There are many more parameters/criteria which contribute toward project success.

## A.2. Program and Program Management

Program and program management have been defined in many articles (Guide, 2001; Ross and Shaltry, 2005; Thiry, 2015). But the definitions retrieved from these diverse ranges of sources were not very different. One of the most accepted definitions is the one from the Project Management Institute (Ross and Shaltry, 2005).

A **program** is defined as *"A group of related projects managed in a coordinated way to obtain benefits and control not available from managing them individually"* (Ross and Shaltry, 2005).

**Program Management** is defined as *"The centralised, coordinated management of a program to achieve the program's strategic objectives and benefits"* (Ross and Shaltry, 2005).

Ross and Shaltry (2005) also highlight the themes that come under program management that make a program successful. Program management can be grouped under three themes: Benefits Management, Stakeholder Management and Program Governance.

**Benefits Management** analyzes the program's significance and performance outcomes identify the interrelatedness of potential advantages being rendered among various projects inside that program, makes

sure that potential advantages are realistic and assigns responsibility and obligations for the program's actual realising benefits.

**Stakeholder Management** at the program level identifies the potential benefits and risks a project might have and how the affected stakeholders can be compensated. The idea is to keep the program acceptance high and manage stakeholders to achieve strategic goals.

**Program Governanc**e is about controlling the projects to keep them aligned with the program goals using steering mechanisms. Governance can be achieved by implementing control through monitoring and reviewing the reports in different phases of the project.

# Appendix B: Questions of Exploratory Interviews

The main purpose of conducting exploratory interviews was to capture the wide variety of perspectives that employees of different designations and with different backgrounds hold. For the same reason, four interviewees with very different backgrounds, departments and designations were chosen. For the exploratory interviews, eight questions were planned (as mentioned below). Some of the questions were based on the findings from the literature review, and others were based on the problems reflected by supervisors in the preliminary discussions. The exploratory interview was first exploratory towards this research where the viewpoint or perspective of employees was taken into account and documented. Most of the questions were open questions and therefore yielded very subjective and different answers from all of the interviewees. Therefore, to make it understandable and to the point, the following summaries were generated using the transcript of those interviews.

1. What skillset and mindset do you think is required for opportunity management? Do you think the mindset and skillset required to manage opportunities are covered by project management? Or do you think there is a need for a different set of skills or mindset to work on OM?

   a. *Interview1: Everyone has a very individual mindset and they try to focus on the area of the project which aligns with their mindset. So, each person has their own agenda, and they try to plug that into whatever project they are working on. Each person has their own drive. This also means that every individual will not focus on and consider all organizational goals, rather focus on the part which overlaps with his/her own personal agenda. To improve OM we need to have someone connecting the dots.*

   b. *Inetrview2: There is a different type of mindset required. You have to be brave to challenge your client, you have to take that risk. Not every opportunity will result in a solution, but it is not a sure shot. The value of a team is something we can embrace; everyone will bring something to the table.*

   c. *Interview3: All of these things (skillset and mindset) come down to experience. If they have either worked on a project which closely resembles an older project, they will have more confidence in exploiting opportunities. Timeframe of a project and type of contract really establish how much we can explore and try out new stuff.*

   d. *Interview4: You need a different mindset; people are capable but not aware. The first thing our system asks for is "if you have done this project before or not", and based on that, we think we have to even look into exploring new risks and opportunities.*

2. There is a study proposing a link between individual traits such as personality traits and competencies to being an entrepreneurial or project manager. So, the study suggests that project managers are good at exploiting opportunities and not so good at discovering them; whereas, entrepreneurs are good at discovering opportunities and not at exploiting them. Do you see a link over there and also a problem? And what are your views on that?

a. *Interview1: Project Managers are focused on the target of the firm and mostly in terms of numbers. They focus more on achieving those goals and numbers. This is also something that firms ask them to focus on. Because of so much focus on controlling they overlook the opportunities.*

b. *Inetrview2: I don't see a difference between risks and opportunities. Entrepreneurs want to have to discover new ideas, new markets and they all try to do it by discovering opportunities. Completely agree that BD focus on discovering and PM focus on managing.*

c. *Interview3: BD sometimes tries to create not so normal projects, like a live brownfield site under a lumpsum contract, which is basically not possible. So, BD saw the Opportunity to explore and make money but we ended up with a project that was not feasible.*

d. *Interview4: There is a link. But I think project managers are not even capable of managing those opportunities also. It is not facilitated and also not encouraged. Business Developers look into opportunities, but only find new clients, and do not too much focus on new markets. There is not much focus on finding and also not much skillset of exploiting opportunities.*

3. As the core idea of this research is to learn from business developers. During the initial discussions and meetings with colleagues at Royal HaskoningDHV, it was discovered that business developers work on opportunities to reach the strategic goals of the organisation. But now I would like to have your views on this.

- Do you think they will be able to help in this direction?

- Do you think they practice OM in some way or the other?

- If so, do they practice it with a structure or it is rather intrinsic and embedded deep into their nature of work?

a. *Interview1: Business developers do enormous work but it is not openly visible on the surface. They are involved in the process of creating work. Do not have enough knowledge about it.*

b. *Inetrview2: A business developer who was PM might not be helpful. Business developer goes into the shoes of the client, try to understand their needs and create a project out of it. So, they will be helpful. Business developers work it very subjective. Different business developers work in different ways. It is their part of the job, but they also put in the effort to really understand the client and create a business. They have to find a problem-solution fit.*

c. *Interview3: They definitely have a role to play, they go out and meet the client, they can ask and explain concepts like value engineering. In order to see an opportunity, you have to have an experience. There is always an opportunity in risk, so you have to know how to re risk and make an opportunity out of the risk. The opportunity is always to talk in a way that they will win the project. But sometimes BD proposes and scope the project so high that it becomes hard for the PM to realize it in reality, and that is a problem.*

d. *Interview4: BD could help find and exploit the opportunity. In the perfect world, there should not be much difference between BD and PM. So, PM should also try to incorporate BD work, which is rare. Sometimes BD promises something and do not follow on that or do not know how to manage it. It is the basis of their job to create and exploit the opportunity. BD and Entrepreneurs' jobs are very large overlap. Their task in the company is approaching the market, either by managing a portfolio of clients or creating new markets.*

4. Could you think of some examples where being aware of opportunities would have increased the value of the project?

   a. *Interview1: No answer*

   b. *Inetrview2: Value engineering is about analyzing the client's requirement and trying to make a project out of it. They choose a vendor who is an expert and also has the capacity to deliver the project. Our history says you have to deliver what the client asks for. So, it's not a creative process.*

   c. *Interview3: Every project small or large will have a risk and every risk, if managed very well we can create an opportunity out of it. The central idea is how you can manage everything, from time to scope, to risk in such a way that it helps everyone, then you create an opportunity. This is what I call playing chess, i.e. looking ahead in time and realizing what all possible strategies one can pursue in order to mitigate that risk; which involves looking 4 steps ahead. PM should also be given some room to hit opportunities. If they don't have any room to make decisions (because of the tight timeline, cost, scope) they cannot do much.*

   d. *Interview4: We used a project to develop a framework to optimize the process of that project. Followed by that we had 5 similar projects. So, we created this new framework based on the learnings from 1 project and used it in the other 5.*

5. What are the ramifications of always trying to pursue opportunities? For example, will it cost a lot more?

   a. *Interview1: You have a wider range of getting success but also getting into problems.*

   b. *Inetrview2: There is a cost for exploring, but it is also an added value for yourself. So, you built on it. For decision making we can make quantitative assessments also for OM, we do this when working with new clients and creating new business.*

   c. *Interview3: Every risk can be converted into an opportunity, but every opportunity comes with risk. So, the best would be to make use of your experience to make a decision.*

   d. *Interview4: Knowing your client create some room for the PM to explore opportunities.*

6. Previous research has shown that there are 5 major barriers towards adopting a wider definition of risk management (which includes both threat and OM). So how much do you agree to this rate 1-10:

    a. Ignorance (Ignoring the definition and not including threats and opportunities completely)

        i. *Interview1: 9*

        ii. *Inetrview2: 8*

        iii. *Interview3: 8 It could be but depends on the context (type of contract, timeline, the person doing that).*

        iv. *Interview4: 10 If it is not on the top of your mind then you might ignore it.*

    b. Language (Associating risk with negative or threats only)

        i. *Interview1: 5 If you have a mindset then language is not a problem*

        ii. *Inetrview2: 3 It plays a role but not much. It is more of semantics.*

        iii. *Interview3: 8 Yes because people see risk as a problem. People are not very clear about the language… meaning of risk, uncertainty and contingency.*

        iv. *Interview4: 8 It is a cultural diffrence and Dutch language, we always see risk as negative.*

    c. Culture (Culture of the organisation believes to focus more on threats)

        i. *Interview1: 8*

        ii. *Inetrview2: 9 Culture is a very big thing for the construction industry. This is what we need to change to become more entrepreneurial.*

        iii. *Interview3: 9 If you are risk-averse then it could be. They accept the risk that is equal to market level, and over that it is based on individual capability, situation, type of client etc.*

        iv. *Interview4: 7: It is important but it is not the bottleneck.*

    d. Psychology (They want to first reduce threats and then maybe think about OM)

        i. *Interview1: 8*

        ii. *Inetrview2: 7*

        iii. *Interview3: 4 It also depends on the situation and circumstances.*

        iv. *Interview4: 7: People focus on first treats and then opportunities.*

    e. Inertia (Continuing with the same practices and beliefs that have been carried over in the industry for decades)

        i. *Interview1: 8*

       ii.   *Inetrview2: 9*

      iii.   *Interview3: 9 People have dome RM so many times, that now they don't even look into new stuff.*

      iv.   *Interview4: 5: Agree it is hard in the construction world, but you have to be disruptive otherwise people will not change.*

f.   Do you think or have any other barrier in mind, which is not covered under these 5? For example, it costs extra money, may change the scope of the project, not a requirement from the client, etc.?

       i.   *Interview1: OM is not asked from the client-side. The client has a goal to be sustainable but they do not ask consultants to explore opportunities to make the project more sustainable. They don't want any changes in the scope of the project. The western mindset of thinking restrictively is also a barrier. The client asks for proven techniques and does not want to explore new ideas.*

      ii.   *Inetrview2: We work on very critical assets and they cannot be compromised. This also somehow restricts us to explore and trying new things. Time restriction, cost restriction, etc…. somehow make a restrictive mindset and consultants don't develop that kind of mindset.*

      iii.   *Interview3: The risk and opportunity of the topic in itself is connected to many other factors. Therefore, it is very subjective. So, there are too many variables.*

      iv.   *Interview4: No other barriers*

7.   The exploratory interviews will be followed by interviews with business developers and project managers. I am planning to get some strategies or solutions from the business developers for the barriers that project managers face in implementing opportunity management. If you were in my shoes, what would you ask business developers and project developers respectively in those interviews?

a.   *Interview1: No answer*

b.   *Inetrview2: How do you find O and what do you do? Where are you searching for it, what kind of questions do you ask your client, where do you find them? What was your greatest success finding O... They can think about the best and the worst stories? How that can inspire PM.*

c.   *Interview3: How can we talk to each other more often to have a better balance between vision and PM reality?*

d.   *Interview4: What barriers do they feel in the project? Is it a barrier in the company, system or the personal ability to explore O?*

8.   Final question: Do you have any other suggestions, documents or colleagues who have a better understanding of this topic and can help me further on this research?

*Answers mostly involve names and personal information and therefore not disclosed.*

# Appendix C: Q Methodology

This appendix contains thorough information regarding the steps involved in Q-methodology. Q-methodology comprises six key steps, as mentioned in the main report, and this appendix is likewise structured around those six steps.

## C.1. Collecting Statements and Selecting Statements

As mentioned in the report, five pieces of literature were studied to make a comprehensive list of competencies. Following is the list of competencies present in the literature:

**Project Management competencies**

**C.1.1.** Dainty et al. (2004) put out a set of 12 core behavioural competencies for effective project management (Table C.0.1). This list was derived from interviews conducted with project managers in the construction industry and only provided a list of behavioural competencies, therefore is not a wholesome list for project management competencies. This means this list should either be combined with other lists of competencies to create a wholesome list.

*Table C.0.1 Behavioural competencies for effective project management (Dainty et al., 2004)*

| Competencies |
| --- |
| 1. **Achievement orientation** |
| 2. **Initiative** |
| 3. **Information seeking** |
| 4. **Focus on client's needs** |
| 5. **Impact & influence** |
| 6. **Directiveness/assertiveness** |
| 7. **Teamwork & co-operation** |
| 8. **Team leadership** |
| 9. **Analytical thinking** |
| 10. **Conceptual thinking** |
| 11. **Composure** |
| 12. **Flexibility** |

**C.1.2.** IPMA ICB 4.0 (2018) provides a framework for project management competencies (Table C.0.2). IMPA also provide a detailed overview of the competencies, which makes it easy to understand and interpret. The competencies in this list are divided into three categories, i.e. People, Perspective and Practice.

**People competencies** are the personal and interpersonal competencies needed to successfully engage in or lead a project, program, or portfolio.

**Practice competencies** are the unique procedures, tools, and strategies utilized in projects, programs, or portfolios to achieve success.

**Perspective competencies** include the strategies, tools, and tactics by which individuals engage with their surroundings, as well as the reasoning that drives people, organizations, and communities to initiate and support projects, programs, and portfolios.

Following is the list of project management competencies from IPMA ICB 4.0 (2018).

*Table C.0.2 IPMA ICB 4.0 (2018) List of Project Management Competencies*

| People Based | Practice Based | Perspective Based |
|---|---|---|
| • Self-reflection and Self-management<br>• Personal integrity and reliability<br>• Personal communication<br>• Relationships and engagement<br>• Leadership<br>• Teamwork<br>• Conflict and crisis<br>• Resourcefulness<br>• Negotiation<br>• Results orientation | • Project design<br>• Requirements and objectives<br>• Scope<br>• Time<br>• Organization and information<br>• Quality<br>• Finance<br>• Resources<br>• Procurement<br>• Plan and control<br>• Risk and opportunity<br>• Stakeholder<br>• Change and transformation | • Strategy<br>• Governance, structure and processes<br>• Compliance, standards and regulations<br>• Power and interest<br>• Culture and values |

This list of competencies presented in IPMA ICB 4.0 (2018) also covers all of the competencies mentioned in Dainty et al. (2004). In Table C.0.3 you can notice the overlaps observed between the list provided by Dainty et al. (2004) and IPM ICB 4.0 (2018).

*Table C.0.3 overlaps observed between the list provided by Dainty et al. (2004) and IPM ICB 4.0 (2018).*

| S. No. | Competencies presented by Dainty et al. (2004) | Competencies presented by IPMA ICB 4.0 (2018) |
|---|---|---|
| 1 | Achievement orientation | Result orientation |
| 2 | Initiative | Leadership |
| 3 | Information seeking | Negotiation |

| 4 | Focus on client's needs | Result orientation |
|---|---|---|
| 5 | Impact & influence | Personal communication |
| 6 | Directiveness/assertiveness | Leadership |
| 7 | Teamwork & co-operation | Teamwork |
| 8 | Team leadership | Leadership |
| 9 | Analytical thinking | Resourcefulness |
| 10 | Conceptual thinking | Leadership |
| 11 | Composure | Self-management, Relations and engagement |
| 12 | Flexibility | Self-management |

Therefore, looking at the overlaps of Dainty et al. (2018) list with the IPMA ICB 4.0 (2018) list, it can be clearly seen that it is best to consider the IPMA ICB 4.0 list of competencies. Other than that, the IPMA list of competencies has been used by many researchers in the past and therefore serves as a benchmark for a complete list of competencies for project managers.

**Entrepreneurial competencies**

Following are the three lists of competencies:

### C.1.3. By Mitchelmore and Rowley (2010)

Mitchelmore and Rowley did a literature review in 2010 and came up with the following list of competencies. The following list was composed using references from the studies conducted on identifying the competencies of an entrepreneur.

*Entrepreneurial competencies*
- Identification and definition of a viable market niche
- Development of products or services appropriate to the firm's chosen market niche/product innovation
- Idea generation
- Environmental scanning
- Recognising and envisioning taking advantage of opportunities
- Formulating strategies for taking advantage of opportunities

*Business and management competencies*
- Development of the management system necessary for the long term functioning of the organisation
- Acquisition and development of resources required to operate the firm
- Business operational skills
- Previous involvement with start-ups
- Managerial experience
- Familiarity with industry
- Financial and budgeting skills

- Previous experience
- Management style
- Marketing skills
- Technical skills
- Industry skills
- The ability to implement strategy (develop programmes, budgets, procedures, evaluate performance)
- Familiarity with the market
- Business plan preparation
- Goal-setting skills
- Management skills

*Human relations competencies*
- Development of the organisational culture management feel is necessary to guide the firm
- Delegation skills
- The ability to motivate others individually and in groups
- Hiring skills
- Human relations skills Leadership skills
- Conceptual and relationship competencies

*Conceptual competencies*
- Organisational skills Interpersonal skills
- The ability to manage customers
- Mental ability to coordinate activities
- Written communication skills
- Oral communication skills
- Decision-making skills
- Analytical skills
- Logical thinking skills
- Deal-making skills
- Commitment competencies

## C.1.4. EntreComp by Bacigalupo et al. (2016)

EntreComp: The Entrepreneurship competence framework (Bacigalupo et al., 2016) is a framework made by the European Commission. Entrecompe divides competencies into three categories: Ideas & Opportunities, Resources and Into Action. A detailed list of competencies is provided below in Table C.0.4, C.0.5 and C.0.6.

*Table C.0.4 Entrepreneurial Competencies: Ideas & Opportunities (Bacigalupo et al., 2016)*

| Competence | Hint | Description |
|---|---|---|
| Spotting opportunities | Use your imagination and abilities to identify opportunities for creating value | • Identify and seize opportunities to create value by exploring the social, cultural and economic landscape<br>• Identify needs and challenges that need to be met<br>• Establish new connections and bring together scattered elements of the landscape to create opportunities to create value |
| Creativity | Develop creative and purposeful ideas | • Develop several ideas and opportunities to create value including better solutions to existing and new challenges<br>• Explore and experiment with innovative approaches<br>• Combine knowledge and resources to achieve valuable effects |
| Vision | Work towards your vision of the future | • Imagine the future<br>• Develop a vision to turn ideas into action<br>• Visualise future scenarios to help guide effort and action |
| Valuing ideas | Make the most of ideas and opportunities | • Judge what value is in social, cultural and economic terms<br>• Recognise the potential an idea has for creating value and identify suitable ways of making the most out of it |
| Ethical and sustainable thinking | Assess the consequences and impact of ideas, opportunities and actions | • Assess the consequences of ideas that bring value and the effect of entrepreneurial action on the target community, the market, society and the environment<br>• Reflect on how sustainable long-term social, cultural and economic goals are, and the course of action chosen<br>• Act responsibly |

*Table C.0.5 Entrepreneurial Competencies: Resources (Bacigalupo et al., 2016)*

| Competence | Hint | Description |
|---|---|---|
| Self-awareness & self-efficacy | Believe in yourself and keep developing | • Reflect on your needs, aspirations and wants in the short, medium and long term<br>• Identify and assess your individual and group strengths and weaknesses<br>• Believe in your ability to influence the course of events, despite uncertainty, setbacks and temporary failures |
| Motivation & perseverance | Stay focused and don't give up | • Be determined to turn ideas into action and satisfy your need to achieve<br>• Be prepared to be patient and keep trying to achieve your long-term individual or group aims<br>• Be resilient under pressure, adversity, and temporary failure |
| Mobilising resources | Gather and manage the resources you need | • Get and manage the material, non-material and digital resources needed to turn ideas into action<br>• Make the most of limited resources<br>• Get and manage the competences needed at any stage, including technical, legal, tax and digital competences |
| Financial & economic literacy | Develop financial and economic know-how | • Estimate the cost of turning an idea into a value-creating activity<br>• Plan, put in place and evaluate financial decisions over time<br>• Manage financing to make sure your value-creating activity can last over the long term |
| Mobilising others | Inspire, enthuse and get others on board | • Inspire and enthuse relevant stakeholders<br>• Get the support needed to achieve valuable outcomes<br>• Demonstrate effective communication, persuasion, negotiation and leadership |

*Table C.0.6 Entrepreneurial Competencies: Into Action (Bacigalupo et al., 2016)*

| Competence | Hint | Description |
|---|---|---|
| Taking the initiative | Go for it | • Initiate processes that create value<br>• Take up challenges<br>• Act and work independently to achieve goals, stick to intentions and carry out planned tasks |
| Planning & management | Prioritise, organise and follow up | • Set long-, medium- and short-term goals<br>• Define priorities and action plans<br>• Adapt to unforeseen changes |
| Coping with uncertainty, ambiguity & risk | Make decisions dealing with uncertainty, ambiguity and risk | • Make decisions when the result of that decision is uncertain, when the information available is partial or ambiguous, or when there is a risk of unintended outcomes<br>• Within the value-creating process, include structured ways of testing ideas and prototypes from the early stages, to reduce risks of failing<br>• Handle fast-moving situations promptly and flexibly |
| Working with others | Team up, collaborate and network | • Work together and co-operate with others to develop ideas and turn them into action<br>• Network<br>• Solve conflicts and face up to competition positively when necessary |
| Learning through experience | Learn by doing | • Use any initiative for value creation as a learning opportunity<br>• Learn with others, including peers and mentors<br>• Reflect and learn from both success and failure (your own and other people's) |

### C. 1.5. By Bird (2019)

A list of success competencies for entrepreneurs with empirical support was presented by Bird (2019). Bird divide competencies into three categories. In the first category, Motive and traits are the hardest to change. Followed by the second category, social role and self-concept, which can be changed. And the third category is skills, which can easily be changed or developed.

*Motive and trait level:*
- Tolerance of ambiguity
- need for control of material (financial) outcomes
- Achievement/task motivation
- Drive

*Social role and self-concept level:*
- Recognizing the importance of business relationships
- Concern for the high quality of work
- Recognizing and acting on opportunity
- Assertiveness

*Skill level:*
- Designing specific products or services
- Designing the specific business organization
- Manoeuvring in the industry
- Motivating organization members
- Creating and utilizing networks
- Comprehensive and detailed planning
- Monitoring the work of others
- Knowledge of "nance/cash management
- Knowledge of engineering
- Knowledge of accounting
- Knowledge of marketing and sales
- Knowledge about leadership
- Knowledge about oral communication
  Knowledge about human relations skills

As mentioned in the main report, a rational choice was made between the above-mentioned list of competencies. The explanation for this rational decision can be found in the main report under section 5.2.

## C.2. Defining Q-set

Table C.0.7 illustrates the overlaps between the Entrepreneurial competencies presented by (Bacigalupo et al., 2016) and Project Management Componentises presented by (IPMA ICB 4.0, 2018). The last two columns cite the exact words mentioned in the literature.

*Table C.0.7 overlaps between the Entrepreneurial competencies presented by (Bacigalupo et al., 2016) and Project Management Componentises presented by (IPMA ICB 4.0, 2018)*

| S. No. | Entrepreneurial competencies (Bacigalupo et al., 2016) | Project Management Componentises (IPMA ICB 4.0, 2018) | Reference from EntreComp (Bacigalupo et al., 2016) | Reference from IPMA ICB 4.0 (2018) |
|---|---|---|---|---|
| 1 | Spotting opportunities | Risk and Opportunities | Identify and seize opportunities to create value by exploring the social, cultural and economic landscape. Identify needs and challenges that need to be met. Establish new connections and bring together scattered elements of the landscape to create opportunities to create value | Risk and opportunity include the identification, assessment, response planning and implementation and control of risks and opportunities around projects. |
| 2 | Creativity | - | Develop several ideas and opportunities to create value, including better solutions to existing and new challenges. Explore and experiment with innovative approaches. Combine knowledge and resources to achieve valuable effects | - |
| 3 | Vision | - | Imagine the future. Develop a vision to turn ideas into action. Visualise future scenarios to help guide effort and action | - |

| 4 | Valuing ideas | Resourcefulness | Judge what value is in social, cultural and economic terms. Recognise the potential an idea has for creating value and identify suitable ways of making the most out of it | Resourcefulness is the ability to apply various techniques and ways of thinking to define, analyse, prioritise, find alternatives for and deal with or solve challenges and problems. Analytical skills, imagining an unknown future state, Identifying and seeing different perspectives. |
|---|---|---|---|---|
| 5 | Ethical and sustainable thinking | Personal integrity & Reliability | Assess the consequences of ideas that bring value and the effect of entrepreneurial action on the target community, the market, society and the environment. Reflect on how sustainable long-term social, cultural and economic goals are and the course of action chosen. Act responsibly | Personal integrity means that the individual is acting in accordance with his or her own moral and ethical values and principles. Reliability is acting dependably, according to expectations and/or agreed behaviour. |
| 6 | Self-awareness & self-efficacy | Self-reflection & self-management | Reflect on your needs, aspirations and wants in the short, medium and long term. Identify and assess your individual and group strengths and weaknesses. Believe in your ability to influence the course of events, despite uncertainty, setbacks and temporary failures | Self-reflection is the ability to acknowledge, reflect on and understand one's own emotions, behaviours, preferences and values and to understand their impact.<br><br>Self-management is the ability to set personal goals, to check and adjust progress and cope with daily work in a systematic way. |
| 7 | Motivation & perseverance | Self-management | Be determined to turn ideas into action and satisfy your need to achieve. Be prepared to be patient and keep trying to achieve your long-term individual or group goals. | Self-management is the ability to set personal goals, to check and adjust progress and to cope with daily work in a systematic way. It includes managing changing conditions and dealing successfully with stressful situations. |

| | | | Be resilient under pressure, adversity, and temporary failure | |
|---|---|---|---|---|
| 8 | Mobilising resources | Resourcefulness | Manage the material, non-material and digital resources needed to turn ideas into action. Make the most of limited resources. Get and manage the competencies needed at any stage, including technical, legal, tax and digital competences | Resourcefulness is the ability to apply various techniques and ways of thinking to define, analyse, prioritise, find alternatives for and deal with or solve challenges and problems. It often requires thinking and acting in original and imaginative ways and stimulating the creativity of individuals and the collective creativity of the team. |
| 9 | Financial & economic literacy | Finance | Estimate the cost of turning an idea into a value-creating activity. Plan, put in place and evaluate financial decisions over time. Manage financing to make sure my value-creating activity can last over the long term | Finance includes all activities required for estimating, planning, gaining, spending- ing and controlling financial resources, both the inflow and outflow to the project. Finance, therefore, includes the cost management (outflow often related to a budget) as well as the financing (inflow external to the organisation) and/or funding (inflow from within the organisation) required for successful management of the project. |
| 10 | Mobilising others | Personal communication & Leadership & Teamwork | Inspire and enthuse relevant stakeholders. Get the support needed to achieve valuable outcomes. Demonstrate effective communication, persuasion, negotiation and leadership | Personal communication includes the exchange of proper information, delivered accurately and consistently to all relevant parties. Leadership means providing direction and guidance to individuals and groups. It involves the ability to choose and apply appropriate styles of management in different situations. |

| | | | | Teamwork is about bringing people together to realise a common objective. |
|---|---|---|---|---|
| 11 | Taking the initiative | - | Initiate processes that create value. Take up challenges. Act and work independently to achieve goals, stick to intentions and carry out planned tasks | - |
| 12 | Planning & management | Result orientation | Set long-, medium- and short-term goals. Define priorities and action plans. Adapt to unforeseen changes | Results orientation is the critical focus maintained by the individual on the outcomes of the project. The individual prioritises the means and resources to overcome problems, challenges and obstacles in order to obtain the optimum outcome for all the parties involved. |
| 13 | Coping with uncertainty, ambiguity & risk | Conflicts and crisis & resourcefulness | Make decisions when the result of that decision is uncertain, when the information available is partial or ambiguous, or when there is a risk of unintended outcomes. Within the value-creating process, include structured ways of testing ideas and prototypes from the early stages to reduce the risks of failing. Handle fast-moving situations promptly and flexibly | Anticipate and possibly prevent conflicts and crises. Analyse the cause and consequences of conflicts and crises. Mediate and resolve conflicts and crises. Resourcefulness is useful when risks, opportunities, problems and difficult situations arise. |
| 14 | Working with others | Relationships and engagement & Conflict | Work together and co-operate with others to develop ideas and turn them into action. Network. | Personal relationships build the foundation for productive collaboration, personal engagement and commitment to others. Conflict and crisis include moderating or solving conflicts |

| | | | | |
|---|---|---|---|---|
| | | s and crisis | Solve conflicts and face up to competition positively when necessary | and crises by being observant of the environment and noticing and delivering a remedy for dis-agreements. |
| 15 | Learning through experience | Self-reflectio n | Use any initiative for value creation as a learning opportunity. Learn with others, including peers and mentors. Reflect and learn from both success and failure (your own and other people's). | Reflecting on personal values and behaviour, seeking feedback and being aware of the individual natural primary reactions opens up the possibility of changing and improving behaviour Reflection and self-analysis techniques. Feedback rules and techniques. |

After Creating a list of statements (competencies), a single-line definition for defining each competency was produced. These definitions are used for the understanding of the participants. In the survey, competencies are accompanied by definitions mentioned in IPMA ICB 4.0 (2018) and EntreComp (Bacigalupo et al., 2016). **Following, you can see the full definitions with the bold parts, which were used to frame one-line definitions for the Q sorting survey.**

## 1    Project Management Competencies

**People-Based:**

1.  Self-reflection and Self-management: Self-reflection is the **ability to acknowledge, reflect on and understand one's own emotions, behaviours, preferences and values and to understand their impact.** Self-management is the **ability to set personal goals, to check and adjust progress and cope with daily work in a systematic way.** It includes managing changing conditions and dealing successfully with stressful situations.

2.  Personal integrity and reliability: The delivery of project benefits involves making many individual commitments to get things done. Individuals must demonstrate personal integrity and reliability because a lack of these qualities may lead to a failure of the intended results. Personal integrity means that the individual **is acting in accordance with his or her own moral and ethical values and principles.** Reliability is **acting dependably, according to expectations and/or agreed behaviour.**

3.  Personal communication: Personal communication includes **the exchange of proper information, delivered accurately and consistently to all relevant parties.**

4. Relationships and engagement: Personal relationships build the foundation for the productive collaboration, personal engagement and commitment of others. This includes one-to-one relationships as well as setting up a whole network of relations. Time and attention have to be invested in establishing durable and robust relations with individuals. The **ability to form strong relationships is primarily driven by social competencies such as empathy, trust, confidence and communication skills.** Sharing visions and goals with individuals and the team drives others to engage in tasks and to commit to the common goals.

5. Leadership: Leadership means **providing direction and guidance to individuals and groups**. It involves the ability to choose and apply appropriate styles of management in different situations. Besides displaying leadership with his or her team, the individual needs to be seen as a leader in representing the project to senior management and other interested parties.

6. Teamwork: Teamwork is about **bringing people together to realise a common objective**. Teams are groups of people working together to realise specific objectives. Project teams are commonly multi-disciplinary; specialists in different disciplines work together to realise complex outcomes. Teamwork is about building a productive team by forming, supporting and leading the team. Team communication and team relationships are among the most important aspects of successful teamwork.

7. Conflict and crisis: Conflict and crisis includes **moderating or solving conflicts and crises by being observant of the environment** and noticing and delivering a remedy for dis-agreements. Conflicts and crises may include events and situations, character conflicts, stress levels and other potential dangers. The individual must handle these scenarios appropriately and stimulate a learning process for future conflicts and crises.

8. Resourcefulness: Resourcefulness is the **ability to apply various techniques and ways of thinking to defining, analysing, prioritising, finding alternatives for and dealing with or solving challenges and problems.** It often requires thinking and acting in original and imaginative ways and stimulating the creativity of individuals and the collective creativity of the team. Resourcefulness is useful when risks, opportunities, problems and difficult situations arise.

9. Negotiation: Negotiation is the process between two or more parties that **aims to balance different interests, needs and expectations in order to reach a common agreement** and commitment while maintaining a positive working relationship. Negotiation includes both formal and informal processes such as buying, hiring or selling or regarding requirements, budget and resources in projects.

10. Results orientation: Results orientation is the critical focus maintained by the individual on the outcomes of the project. **The individual prioritises the means and resources to overcome problems, challenges and obstacles in order to obtain the optimum outcome for all the parties involved.** The results are continuously placed at the forefront of the discussion and the team drives toward these outcomes. One critical aspect of results orientation is productivity, which is measured as a combination of effectiveness and

efficiency. The individual needs to plan and deploy resources efficiently to realise the agreed results and be effective.

**Practice-Based:**

1. Project design: Design **describes how the demands, wishes and influences of the organisation(s) are interpreted and weighed by the individual and translated into a high-level design of the project to ensure the highest probability of success**. Derived from this outer context, design drafts a 'charcol sketch' - a blueprint or overall architecture of how the project should be set up, laid out and managed. This considers resources, funds, stakeholders' objectives, benefits and organisational change, risks and opportunities, governance, delivery, priorities and urgency. Because all outer factors and success criteria (and/or the perceived relevance of these) often change over time, this design needs to be evaluated periodically and, if necessary, adjusted.

2. Requirements and objectives: Every project is undertaken because internal and external stakeholders want to achieve something. This competence element describes the 'why' of the project – which goals are to be achieved, which benefits are to be realised, **which objectives are to be reached and which stakeholders' requirements are to be fulfilled.** They are derived from needs, expectations, requirements and strategic organisational goals from the stakeholders.

3. Scope: Scope defines **the specific focus or content of the project**. It describes the outputs, outcomes and benefits and the work required to produce them. It also deals with the counterpart – describing what is not contained in or part of the project. In essence, scope defines the boundaries of the project.

4. Time: Time includes **the identification and structuring of all components of a project in time** in order to optimise the execution.

5. Organization and information: Organisation and information includes the definition, implementation and management of the temporary project organisation. Organisation and information also includes **the definitions of required roles and responsibilities as well as effective information exchange for the temporary organisation.** This competence element also includes the creation and storage of documentation, reporting structures and the project internal communication flows.

6. Quality: Quality in projects has two key drivers. On the one hand, it is about the quality of the process, the way in which the project is organised. This is about developing, implementing and reviewing standards for the way quality is addressed in com- ponent sub-projects and tasks. On the other hand, it is about **managing, assuring and controlling the quality of the output and outcome of the project**. Quality encompasses the entire project from initiation to posttransition, throughout the whole lifecycle.

7. Finance: Finance includes all activities required for estimating, planning, gaining, spend- ing and controlling financial resources, both the inflow and outflow to the proj- ect. **Finance therefore includes the cost management (outflow often related to a budget) as well as the financing**

**(inflow external to the organisation) and/or funding (inflow from within the organisation) required for successful management of the project.**

8.  Resources: The resources competence element includes defining, acquiring, controlling and developing the resources that are necessary to realising the project's outcome. Resources include people, expertise, facilities, equipment, materials, infrastruc- ture, tools and other assets required to carry out the activities according to the objectives. This competence element includes **defining a strategy for acquiring and utilising the resources for the best performance of the project,** optimising the utilisation of the resources given the time and financial constraints and the continuous monitoring and control of these.

9.  Procurement: Procurement is a process of buying or obtaining goods and/or services from external parties. It includes all processes, from purchase planning to making the purchase and contract administration. Because procurement focuses on the suppliers outside the parent organisation, it procures resources (people, tools, material and sub-deliverables) that are not available from within the organisation. This competence element also includes **choosing or taking the optimal procurement routes,** which should fit the long-term objective of the client but also the organisation (e.g. partnership, joint ventures, etc). These routes can mean sharing funding, expertise, etc, but also entail the risks of failing on the market.

10. Plan and control: Based on the design, all elements come together in a balanced plan, the execution of which is controlled. The plan should **be regularly updated, based on changes happening within the project or in its context. Control is also regularly adapted and improved, so that the individual remains in control.**

11. Risk and opportunity: Risk and opportunity includes the **identification, assessment, response planning and implementation and control of risks** and opportunities around projects. Risk and opportunity management helps decision-makers to make informed choices, prioritise actions and distinguish among alternative courses of action. Risk and opportunity management is an ongoing process taking place throughout the lifecycle of the project.

12. Stakeholder: The stakeholders competence element **includes identifying, analysing, engaging and managing the attitudes and expectations of all relevant stakeholders**. All individuals, groups or organisations participating in, affecting, being affected by, or interested in the execution or the result of the project can be seen as stakeholders. This may include sponsors, clients and users, suppliers/subcon- tractors, alliances and partners and other projects, programmes or portfolios. Stakeholder engagement includes constantly revising, monitoring and acting upon their interests and influence on the project. Stakeholder engagement may also involve building strategic alliances that create organisational capacities and capabilities where both risks and rewards are shared.

13. Change and transformation: Newly developed capabilities only deliver benefits when they are put to use and when they are supported by the organisations and the people receiving them**. Change (improvement of a current situation, keeping the past in mind) and transformation (the emerging development of new situations, based on a vision of the future) provide the process**,

tools and techniques that can be utilised to help individuals and organisations make successful personal and organisational transitions resulting in the adoption and realisation of change.

**Perspective Based:**

1. Strategy: **The strategy competence describes how strategies are understood and trans-formed into manageable elements using projects.** This competence is therefore defining a performance management system in which projects are seen and managed in light of their alignment with the strategy and the vision and ensuring it is highly correlated with the mission and the sustainability of the organisation.

2. Governance, structure and processes: **The governance, structures and processes competence element defines the understanding of and the alignment with the established** structures, systems and processes of the organisation that provide support for projects and influence the way they are organised, implemented and managed. The governance, structures and processes of an organisation may comprise both temporary systems (such as projects) and permanent systems (such as programme and portfolio management systems, financial/administrative systems, supporting systems, reporting systems, and decisionmaking and auditing systems). Sometimes these systems can even form the strategic reason for a project, for example, when a project is initiated for the purpose of improving business processes or establishing new systems.

3. Compliance, standards and regulations: **The compliance, standards and regulations competence element describes how the individual interprets and balances the external and internal restrictions in a given area such as country, company or industry.** Compliance is the process of ensuring adequate adherence to a given set of norms. Compliance requirements operate on a spectrum from voluntary and informal to mandatory and formal. Standards and regulations influence and define the way projects should be organised and managed to be feasible and successful. Standards and regulations address compliance with requirements that include legislation and regulations, contracts and agreements, intellectual property and patents, health, safety, security and environmental protection and professional standards.

4. Power and interest**: The power and interest competence element describes how the individual recognises and understands informal personal and group interests and the result- ing politics and use of power**. This competence element defines how individuals participating in projects should recognise how informal influences (resulting from personal and group ambitions and interests and modified by personal and group relationships) relate with the project context. These informal influences differ from formal interests (as, for instance, formalised in a business justification) that derive from the organisation's strategy or from standards, regulations, etc.

5. Culture and values: The culture and values competence element describes **the individual's approach to influence on the organisation's culture and values and the wider society in which the project is situated**. It also includes the acknowledgement by the individual participating in or leading a project of the consequences of these cultural influences for the project and how to incorporate this knowledge in the management of the project. Culture may be defined as a set of related behaviours within a community and the importance that individuals within the community

attach to it. Values may be defined as a set of concepts on which the individuals in the community base their actions. Explicit definitions of values might include codes of ethics. Many organisations also describe corporate values explicitly in their strategy.

## 2 Entrepreneurial Competencies

1. Creativity: **Develop creative and purposeful ideas.** Develop several ideas and opportunities to create value, including better solutions to existing and new challenges. Explore and experiment with innovative approaches. Combine knowledge and resources to achieve valuable effects.

2. Vision: **Work towards your vision of the future**. Imagine the future. Develop a vision to turn ideas into action. Visualise future scenarios to help guide effort and action.

3. Taking Initiative: Go for it. **Initiate processes that create value**. Take up challenges. Act and work independently to achieve goals, stick to intentions and carry out planned tasks.

### C.3. Selecting the P-set
All information about selecting P-set is provided in the main report.

### C.4. Collect Q-sorts
Following are the set of definitions provided before the start of the survey:

**Risk management**, by definition, is a process of understanding and managing risk before it occurs; it increases the chances of success by dealing with threats and opportunities.

**Threats** are the **downside risks**, which means if a threat occurs, it would have a negative impact on the project.

**Opportunities** are the **upside risks**, which means if an opportunity occurs, it would have a positive impact on the project.

**Opportunity management** is a part of risk management. In the context of this research, opportunity management means the identification, assessment, response and implementation and control of upside risks (opportunities).

We have composed a combined list of project management and entrepreneurial competencies for Q sort. There are three types of competencies included:
1. **People competencies** are the personal and interpersonal competencies needed to successfully engage in or lead a project, program, or portfolio.
2. **Practice competencies** are the unique procedures, tools, and strategies utilized in projects, programs, or portfolios to achieve success.
3. **Perspective competencies** include the strategies, tools, and tactics by which individuals engage with their surroundings, as well as the reasoning that drives people, organizations, and communities to initiate and support projects, programs, and portfolios.

Followed by the definition, initial survey was carryout. The questionaries used for the initial survey is as mentioned below:

1. Are you a:
   a. Project Manager
   b. Business Developer
   c. A mix of both roles
2. The average size of the projects you work on (this is the total project cost, not the Royal HaskoningDHV consulting cost):
   a. 0-10 million
   b. 10-50 million
   c. More than 50 million
3. The average duration of the projects you work on:
   a. 0-6 months
   b. 6-18 months
   c. More than 18 months
4. The average number of parties involved in your projects?
   a. 0-3 parties
   b. 4-10 parties
   c. More than 10 parties
5. The average size of your project team (team of people working from Royal HaskoningDHV on a project):
   a. 0-3 people
   b. 4-10 people
   c. More than 10 people
6. How much freedom do you think you have in making changes in a project or adopting to the circumstances?
   a. Low
   b. Medium
   c. High

Following that, Q-sorting instructions were provided, and participants were asked to carry out the Q-sorting in 2 stages. Followed were the instructions provided to the participants:

First, participants are asked to read all the cards and divide them into 3 piles, i.e. "important for opportunity management", "not important for opportunity management", and "neutral"Then, furtherer instructions were given to sort the given cards on the sorting chart.

After completing Q-sorting, participants were asked to reflection on Q-sorting using seven subjective questions. Following were the questions asked for the reflection survey:

1. Could you please explain in more detail why you have set these competencies at "+3"?

Card no: ___, explanation:

2. Could you please explain in more detail why you have placed exactly these competencies at "+2"?

Card no.: ___, explanation:

Card no: ___, explanation:

Card no: ___, explanation:


3. Could you please explain in more detail why you have placed exactly these competencies on "-3"?

Card no: ___, explanation:

4. Could you please explain in more detail why you have placed exactly these competencies on "-2"?

Card no.: ___, explanation:

Card no: ___, explanation:

Card no: ___, explanation:

5. Are there any other competencies besides the 33 competencies mentioned here? If so, please list them below, including where you would place this factor on the previously used spectrum "-3", "+3"?

6. What other factors do you think influence opportunity management in a project (factors can be anything having a positive or negative influence on the opportunity management process)?

7. In what ways being entrepreneurial would help project managers become better at opportunity management?


## C.5. Q-analysis

Initial survey Results

The initial survey provides some inside about the P-set. Table C.0.8 illustrates the options that participants choose and followed by a few graphs illustrating the same result.

Table C.0.8 Initial Survey Results

| Perspective | No. | Are you a: | No. | The average size of the projects you work on (this is the total project cost, not the RHDHV consulting cost): | No. | The average duration of the projects you work on: | No. | The average number of parties involved in your projects? | No. | The average size of your project team (team of people working from RHDHV on a project): | No. | How much freedom do you think you have in making changes in a project or adopting to the circumstances? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2 | A mix of both roles | 2 | 0-10 million | 2 | 0-6 months | 2 | 0-3 parties | 1 | 0-3 people | 1 | Low |
| 1 | 3 | Business Developer | 3 | 10-50 million | 1 | 6-18 months | 1 | 4-10 parties | 3 | 4-10 people | 4 | Medium |
| | 4 | Project Manager | 4 | More than 50 million | 6 | More than 18 months | 6 | More than 10 parties | 5 | More than 10 people | 4 | High |
| | 2 | A mix of both roles | 1 | 0-10 million | 1 | 0-6 months | 1 | 0-3 parties | 0 | 0-3 people | 2 | Low |
| 2 | 3 | Business Developer | 4 | 10-50 million | 4 | 6-18 months | 4 | 4-10 parties | 5 | 4-10 people | 4 | Medium |
| | 1 | Project Manager | 1 | More than 50 million | 1 | More than 18 months | 1 | More than 10 parties | 1 | More than 10 people | 0 | High |
| | 1 | A mix of both roles | 1 | 0-10 million | 0 | 0-6 months | 0 | 0-3 parties | 0 | 0-3 people | 0 | Low |
| 3 | 2 | Business Developer | 2 | 10-50 million | 3 | 6-18 months | 4 | 4-10 parties | 3 | 4-10 people | 5 | Medium |
| | 3 | Project Manager | 3 | More than 50 million | 3 | More than 18 months | 2 | More than 10 parties | 3 | More than 10 people | 1 | High |

After the initial survey results, the first step in the analysis of the Q-sort is the correlation matrix.

## C.5.1. Correlation matrix

First, a correlation matrix is constructed to represent the relationship of Q-sort with each other Q-sort. Then, as the name implies, the correlation matrix displays contrasts between different points of view (Watts and Stenner, 2005). For example, the correlation matrix obtained by Q-sorting may be seen on the following page (Table C.0.9).

*Table C.0.9 Correlation Matrix*

| Participant | 2ZZM | 6YDQ | 865U | 8BCF | 8F27 | 8ZJ9 | 9XB6 | AT45 | B2L5 | BX9O | CFQM | CVTP | HX5L | MY2O | N3W3 | O467 | R6YT | RVAV | RVD4 | SWCE | UP7W | WDT5 | WI6T |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2ZZM | 1 | 0.64 | 0.38 | 0.37 | -0.13 | 0.34 | 0.39 | 0.52 | 0.66 | 0.37 | 0.04 | 0.15 | 0.46 | 0.18 | 0.38 | 0.1 | 0.55 | 0.11 | 0.52 | 0.09 | 0.03 | 0.16 | 0.74 |
| 6YDQ | | 1 | 0.29 | 0.31 | -0.02 | 0.43 | 0.43 | 0.47 | 0.54 | 0.46 | 0.18 | 0.12 | 0.62 | 0.14 | 0.29 | -0.01 | 0.47 | -0.05 | 0.4 | 0.26 | -0.09 | 0.07 | 0.57 |
| 865U | | | 1 | 0.12 | 0.09 | 0.29 | 0.14 | 0.39 | 0.44 | 0.39 | 0.18 | 0.42 | 0.28 | 0.15 | 0.28 | 0.1 | 0.21 | 0.09 | 0.51 | 0.26 | 0.09 | 0.19 | 0.53 |
| 8BCF | | | | 1 | -0.08 | 0.29 | 0.27 | 0.29 | 0.1 | 0.19 | 0.06 | 0.25 | 0.11 | -0.24 | 0.26 | 0.22 | -0.01 | -0.02 | 0.12 | -0.08 | 0.14 | 0.34 | 0.31 |
| 8F27 | | | | | 1 | -0.09 | -0.08 | 0.09 | 0.04 | -0.1 | -0.09 | -0.09 | 0.07 | -0.29 | -0.01 | -0.14 | -0.14 | -0.27 | -0.25 | -0.04 | -0.13 | 0.1 | -0.08 |
| 8ZJ9 | | | | | | 1 | 0.44 | 0.19 | 0.25 | 0.52 | 0.45 | 0.56 | 0.37 | 0.15 | 0.45 | 0.27 | 0.16 | 0.22 | 0.48 | 0.21 | -0.02 | 0.33 | 0.37 |
| 9XB6 | | | | | | | 1 | 0.32 | 0.29 | 0.17 | -0.03 | 0.05 | 0.26 | 0.03 | 0.17 | -0.2 | 0.07 | -0.28 | 0.16 | -0.07 | -0.2 | -0.21 | 0.37 |
| AT45 | | | | | | | | 1 | 0.67 | 0.22 | -0.05 | 0 | 0.6 | 0.03 | 0.22 | -0.06 | 0.34 | -0.14 | 0.15 | 0.22 | -0.04 | 0.18 | 0.64 |
| B2L5 | | | | | | | | | 1 | 0.18 | 0.17 | -0.05 | 0.59 | 0.2 | 0.14 | 0.13 | 0.32 | -0.15 | 0.39 | 0.21 | -0.14 | 0.16 | 0.46 |
| BX9O | | | | | | | | | | 1 | 0.24 | 0.41 | 0.43 | 0.39 | 0.55 | 0.06 | 0.25 | 0.29 | 0.52 | 0.27 | -0.04 | 0.34 | 0.61 |
| CFQM | | | | | | | | | | | 1 | 0.4 | 0.33 | -0.05 | 0.38 | 0.41 | 0.04 | 0.17 | 0.34 | 0.33 | 0.4 | 0.29 | 0.02 |
| CVTP | | | | | | | | | | | | 1 | 0.16 | 0.03 | 0.36 | 0.04 | -0.09 | 0.35 | 0.43 | 0.23 | 0.2 | 0.29 | 0.22 |
| HX5L | | | | | | | | | | | | | 1 | 0.14 | 0.31 | -0.12 | 0.44 | 0.11 | 0.22 | 0.19 | 0.05 | 0.25 | 0.48 |
| MY2O | | | | | | | | | | | | | | 1 | 0.2 | -0.16 | 0.37 | 0.34 | 0.2 | 0.1 | -0.17 | 0.05 | 0.26 |
| N3W3 | | | | | | | | | | | | | | | 1 | -0.04 | 0.29 | 0.39 | 0.57 | 0.22 | 0.22 | 0.31 | 0.48 |
| O467 | | | | | | | | | | | | | | | | 1 | -0.1 | 0.06 | 0.21 | 0.25 | 0.23 | 0.34 | -0.05 |
| R6YT | | | | | | | | | | | | | | | | | 1 | 0.08 | 0.23 | 0.08 | 0.02 | 0.05 | 0.42 |
| RVAV | | | | | | | | | | | | | | | | | | 1 | 0.45 | -0.05 | 0.03 | 0.35 | 0.17 |
| RVD4 | | | | | | | | | | | | | | | | | | | 1 | 0.3 | -0.06 | 0.14 | 0.44 |
| SWCE | | | | | | | | | | | | | | | | | | | | 1 | 0.14 | 0.2 | 0.19 |
| UP7W | | | | | | | | | | | | | | | | | | | | | 1 | 0.18 | 0.07 |
| WDT5 | | | | | | | | | | | | | | | | | | | | | | 1 | 0.17 |
| WI6T | | | | | | | | | | | | | | | | | | | | | | | 1 |

## C.5.2. Factor extraction

Following the correlation matrix (Table C.0.10), factor extraction is carried out. Here we have used centroid factor analysis (CFA) for factor extraction. The following table shows the unrotated factor loading for CFA.

*Table C.0.10 Unrotated factor matrix*

| Participant | Factor 1 | Factor 2 | Factor 3 | Factor 4 | Factor 5 | Factor 6 | Factor 7 |
|---|---|---|---|---|---|---|---|
| 2ZZM | 0.731 | 0.42653 | -0.15655 | -0.25075 | 0.10669 | -0.06368 | -0.15593 |
| 6YDQ | 0.65547 | 0.41151 | -0.02098 | 0.18272 | 0.09896 | -0.1095 | -0.0967 |
| 865U | 0.55797 | 0.03055 | 0.09168 | 0.12256 | 0.01574 | 0.11853 | 0.10971 |
| 8BCF | 0.33691 | 0.0536 | 0.10822 | -0.35345 | 0.03922 | 0.297 | -0.38708 |
| 8F27 | -0.15576 | 0.19309 | 0.28752 | 0.08597 | -0.06716 | 0.21385 | 0.26693 |
| 8ZJ9 | 0.68373 | -0.17863 | 0.02659 | 0.23362 | 0.05995 | 0.16238 | -0.27462 |
| 9XB6 | 0.25538 | 0.40688 | -0.05187 | 0.25094 | 0.11873 | 0.20624 | -0.36487 |
| AT45 | 0.49881 | 0.61184 | 0.25578 | -0.06732 | 0.19537 | 0.09343 | 0.31282 |
| B2L5 | 0.5451 | 0.48357 | 0.16804 | 0.1364 | 0.12827 | -0.21491 | 0.09259 |
| BX9O | 0.69133 | -0.14105 | -0.1925 | 0.1253 | 0.05054 | 0.15709 | 0.14201 |
| CFQM | 0.42961 | -0.45262 | 0.37363 | 0.14349 | 0.19637 | -0.30568 | -0.15074 |
| CVTP | 0.4503 | -0.39362 | 0.11344 | 0.15275 | 0.10987 | 0.36764 | -0.1167 |
| HX5L | 0.61543 | 0.29167 | 0.08635 | 0.10717 | 0.04572 | -0.09172 | 0.20488 |
| MY2O | 0.25158 | -0.02939 | -0.51353 | 0.07072 | 0.15171 | -0.11336 | 0.35875 |
| N3W3 | 0.64371 | -0.19954 | -0.13841 | -0.0377 | 0.03447 | 0.18507 | 0.02786 |
| O467 | 0.17243 | -0.29888 | 0.38946 | -0.12094 | 0.11422 | -0.17312 | -0.19271 |
| R6YT | 0.42004 | 0.23289 | -0.28141 | -0.06599 | 0.06178 | -0.35713 | 0.16844 |
| RVAV | 0.26979 | -0.512 | -0.33867 | -0.18476 | 0.22069 | 0.11066 | 0.17289 |
| RVD4 | 0.69834 | -0.19348 | -0.2058 | 0.09441 | 0.05808 | 0.00682 | -0.05018 |
| SWCE | 0.34897 | -0.16688 | 0.18305 | 0.1634 | 0.0514 | -0.19029 | 0.0845 |
| UP7W | 0.10777 | -0.21062 | 0.25665 | -0.34789 | 0.08771 | -0.15174 | -0.05073 |
| WDT5 | 0.39712 | -0.24981 | 0.35864 | -0.25697 | 0.10514 | 0.10174 | 0.26726 |
| WI6T | 0.75998 | 0.32625 | -0.17174 | -0.14439 | 0.061 | 0.17553 | 0.11391 |

The factors obtained are summarized below (Table C.0.11). Eigenvalues, explained variance, cumulative explained variance, and the application of Humphrey's rule are all covered here. As stated in Chapter 5, the number of factors is determined by three rules.

*Table C.0.11 Eigenvalues, Explained Variance and Humphrey's Rule of factors from Centroid Factor Analysis*

| Column1 | Factor 1 | Factor 2 | Factor 3 | Factor 4 | Factor 5 | Factor 6 | Factor 7 |
|---|---|---|---|---|---|---|---|
| Eigenvalues | 5.84873 | 2.38765 | 1.35006 | 0.75846 | 0.27332 | 0.86685 | 1.00175 |
| % Explained Variance | 25 | 10 | 6 | 3 | 1 | 4 | 4 |
| Cumulative % Expln Var | 25 | 36 | 42 | 45 | 46 | 50 | 54 |
| Humphrey's Rule | 0.55555 | 0.31326 | 0.2 | 0.12296 | 0.04334 | 0.1313 | 0.14123 |
| Standard Error | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 |

Three factor solution was chosen based on the application of three rules. Table C.0.12 depicts the relationship among the three factors. It is also worth noting that the correlation factors are not particularly high (less than 0.5).

*Table C.0.12 Correlation between factor scores*

| | Factor 1 | Factor 2 | Factor 3 |
|---|---|---|---|
| Factor 1 | 1 | 0.19007 | 0.39993 |
| Factor 2 | | 1 | 0.44764 |
| Factor 3 | | | 1 |

The viewpoints are understood and described using a factor array. In this process, the average of Q-sorts is calculated and compared to the individual factors (Table C.0.13).

*Table C.0.13 Factor array of the three-factor solution*

| Number | Statement | Factor 1 Z-score | Factor 1 Rank | Factor 2 Z-score | Factor 2 Rank | Factor 3 Z-score | Factor 3 Rank | Average |
|---|---|---|---|---|---|---|---|---|
| 1 | *Change and transformation* | 0.56598 | 1 | 1.5458 | 2 | -0.38448 | -1 | 1 |
| 2 | *Compliance, standards and regulations* | -1.67564 | -3 | -0.18933 | 0 | -1.78608 | -2 | -2 |
| 3 | *Conflict and crisis* | -0.66439 | -1 | -0.07764 | 0 | -1.68819 | -2 | -1 |
| 4 | *Creativity* | 1.88731 | 2 | -0.25806 | 0 | 1.91534 | 2 | 2 |
| 5 | *Culture and values* | -0.2174 | 0 | -1.03377 | -1 | -0.60878 | -1 | -1 |
| 6 | *Finance* | -0.97143 | -1 | 1.34726 | 2 | -0.17104 | 0 | 0 |
| 7 | *Governance, structure and processes* | -1.46798 | -2 | -0.85895 | -1 | -0.69139 | -1 | -2 |
| 8 | *Leadership* | 1.59578 | 2 | 0.99997 | 1 | 0.644 | 1 | 2 |
| 9 | *Negotiation* | 0.58902 | 1 | 0.57983 | 1 | 0.75104 | 1 | 1 |
| 10 | *Opportunity* | 2.03423 | 3 | 1.97742 | 3 | 2.0895 | 3 | 3 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 11 | Organization and information | -0.78666 | -1 | -0.58513 | -1 | 0.06358 | 0 | -1 |
| 12 | Personal communication | 0.1729 | 0 | -0.07722 | 0 | 0.6667 | 1 | 0 |
| 13 | Personal integrity | -0.13708 | 0 | -1.55126 | -2 | -0.8305 | -1 | -1 |
| 14 | Plan and control | -0.38527 | -1 | 1.57024 | 2 | 0.07881 | 0 | 1 |
| 15 | Power and interest | -0.79895 | -1 | -0.5409 | -1 | 0.20399 | 0 | -1 |
| 16 | Procurement | -1.50125 | -2 | -0.57027 | -1 | -0.15443 | 0 | -1 |
| 17 | Project design | -0.18936 | 0 | -0.6368 | -1 | -0.33863 | -1 | -1 |
| 18 | Quality | -0.83284 | -1 | 0.5228 | 1 | -0.43221 | -1 | 0 |
| 19 | Relationships and engagement | 0.72324 | 1 | -0.98099 | -1 | 0.37503 | 1 | 0 |
| 20 | Reliability | -0.02767 | 0 | -1.12377 | -2 | 0.21728 | 0 | -1 |
| 21 | Requirements and objectives | -1.24506 | -1 | -0.60607 | -1 | 0.98825 | 1 | 0 |
| 22 | Resourcefulness | 1.10291 | 1 | 0.25973 | 0 | 0.70378 | 1 | 1 |
| 23 | Resources | 0.38889 | 0 | 0.78502 | 1 | 0.24943 | 0 | 1 |
| 24 | Results orientation | 0.93686 | 1 | -0.53452 | 0 | 0.3225 | 1 | 0 |
| 25 | Scope | -0.85205 | -1 | 0.27279 | 0 | 1.36026 | 2 | 1 |
| 26 | Self-management | -0.07424 | 0 | -2.09492 | -3 | -1.96296 | -2 | -3 |
| 27 | Self-reflection | 0.10461 | 0 | -1.6409 | -2 | -1.97572 | -3 | -2 |
| 28 | Stakeholder | -0.26864 | 0 | 1.29211 | 1 | 1.18036 | 2 | 2 |
| 29 | Strategy | -0.18632 | 0 | 0.76743 | 1 | 0.11952 | 0 | 0 |
| 30 | Taking the initiative | 1.30932 | 2 | -0.09662 | 0 | 0.81751 | 1 | 1 |
| 31 | Teamwork | 1.06924 | 1 | 0.93479 | 1 | -0.79907 | -1 | 1 |
| 32 | Threat | 0.6043 | 1 | -0.21944 | 0 | -1.1133 | -1 | 0 |
| 33 | Time | -1.52817 | -2 | 1.07113 | 1 | 0.14268 | 0 | 0 |
| 34 | Vision | 0.72582 | 1 | -0.24973 | 0 | 0.04726 | 0 | 0 |

## C.6. Identifying Perspectives

Following are the three perspectives identified using the Q-methodology.

| -3 | -2 | -1 | 0 | 1 | 2 | 3 |
|---|---|---|---|---|---|---|
| 2. Compliance, standards and regulations | 7. Governance, structure and processes | 14. Plan and control | 23. Resources | 22. Resourcefulness | 4. Creativity | 10. Opportunity |
| | 16. Procurement | 3. Conflict and crisis | 12. Personal communication | 31. Teamwork | 8. Leadership | |
| | 33. Time | 11. Organization and information | 27. Self-reflection | 24. Results orientation | 30. Taking the initiative | |
| | | 15. Power and interest | 20. Reliability | 34. Vision | | |
| | | 18. Quality | 26. Self-management | 19. Relationships and engagement | | |
| | | 25. Scope | 13. Personal integrity | 32. Threat | | |
| | | 6. Finance | 29. Strategy | 9. Negotiation | | |
| | | 21. Requirements and objectives | 17. Project design | 1. Change and transformation | | |
| | | | 5. Culture and values | | | |
| | | | 28. Stakeholder | | | |

Distinguishing Statements

Consensus Statements

*Figure 7 Composite Q-sort for Factor 1*

| -3 | -2 | -1 | 0 | 1 | 2 | 3 |
|---|---|---|---|---|---|---|
| 26. Self-management | 20. Reliability | 15. Power and interest | 25. Scope | 28. Stakeholder | 14. Plan and control | 10. Opportunity |
| | 13. Personal integrity | 16. Procurement | 22. Resourcefulness | 33. Time | 1. Change and transformation | |
| | 27. Self-reflection | 11. Organization and information | 12. Personal communication | 8. Leadership | 6. Finance | |
| | | 21. Requirements and objectives | 3. Conflict and crisis | 31. Teamwork | | |
| | | 17. Project design | 30. Taking the initiative | 23. Resources | | |
| | | 7. Governance, structure and processes | 2. Compliance, standards and regulations | 29. Strategy | | |
| | | 19. Relationships and engagement | 32. Threat | 9. Negotiation | | |
| | | 5. Culture and values | 34. Vision | 18. Quality | | |
| | | | 4. Creativity | | | |
| | | | 24. Results orientation | | | |

Distinguishing Statements

Consensus Statements

*Figure 8 Composite Q-sort for Factor 2*

| -3 | -2 | -1 | 0 | 1 | 2 | 3 |
|---|---|---|---|---|---|---|
| 27. Self-reflection | 3. Conflict and crisis | 17. Project design | 23. Resources | 21. Requirements and objectives | 4. Creativity | 10. Opportunity |
| | 2. Compliance, standards and regulations | 1. Change and transformation | 20. Reliability | 30. Taking the initiative | 25. Scope | |
| | 26. Self-management | 18. Quality | 15. Power and interest | 9. Negotiation | 28. Stakeholder | |
| | | 5. Culture and values | 33. Time | 22. Resourcefulness | | |
| | | 7. Governance, structure and processes | 29. Strategy | 12. Personal communication | | |
| | | 31. Teamwork | 14. Plan and control | 8. Leadership | | |
| | | 13. Personal integrity | 11. Organization and information | 19. Relationships and engagement | | |
| | | 32. Threat | 34. Vision | 24. Results orientation | | |
| | | | 16. Procurement | | | |
| | | | 6. Finance | | | |

Distinguishing Statements

Consensus Statements

*Figure 9 Composite Q-sort for Factor 3*

## C.6.1 Consensus statements

The Q-Analysis was performed using Q Method Software yielded four consensus statements. The Z-scores are used to establish consensus statements (Table C.0.14).

*Table C.0.14 Consensus Statements*

| S. No. | Statement | Factor 1 Z-score | Factor 1 Rank | Factor 2 Z-score | Factor 2 Rank | Factor 3 Z-score | Factor 3 Rank | Over all |
|---|---|---|---|---|---|---|---|---|
| 9 | *Negotiation* | 0.59 | 1 | 0.58 | 1 | 0.75 | 1 | 1 |
| 10 | *Opportunity* | 2.03 | 3 | 1.98 | 3 | 2.09 | 3 | 3 |
| 17 | *Project design* | -0.19 | 0 | -0.64 | -1 | -0.34 | -1 | -1 |
| 23 | *Resources* | 0.39 | 0 | 0.79 | 1 | 0.25 | 0 | 1 |

## C.6.2 Descending factor array of differences

The difference between factors arrays is calculated for each combination of two factors. Tables C.0.15, C.0.16, and C.0.17 offer a full overview of descending factor arrays for each of the three-factor combinations. The difference in Z-scores between any two factors can also be observed in the tables below.

| Statement Number | Statement | Factor 1 | Factor 2 | Difference |
|---|---|---|---|---|
| 4 | *Creativity* | 1.88731 | -0.25806 | 2.14537 |
| 26 | *Self-management* | -0.07424 | -2.09492 | 2.02069 |
| 27 | *Self-reflection* | 0.10461 | -1.6409 | 1.74551 |
| 19 | *Relationships and engagement* | 0.72324 | -0.98099 | 1.70423 |
| 24 | *Results orientation* | 0.93686 | -0.53452 | 1.47138 |
| 13 | *Personal integrity* | -0.13708 | -1.55126 | 1.41418 |
| 30 | *Taking the initiative* | 1.30932 | -0.09662 | 1.40594 |
| 20 | *Reliability* | -0.02767 | -1.12377 | 1.0961 |
| 34 | *Vision* | 0.72582 | -0.24973 | 0.97555 |
| 22 | *Resourcefulness* | 1.10291 | 0.25973 | 0.84319 |
| 32 | *Threat* | 0.6043 | -0.21944 | 0.82374 |
| 5 | *Culture and values* | -0.2174 | -1.03377 | 0.81637 |
| 8 | *Leadership* | 1.59578 | 0.99997 | 0.59581 |
| 17 | *Project design* | -0.18936 | -0.6368 | 0.44744 |
| 12 | *Personal communication* | 0.1729 | -0.07722 | 0.25012 |
| 31 | *Teamwork* | 1.06924 | 0.93479 | 0.13445 |
| 10 | *Opportunity* | 2.03423 | 1.97742 | 0.05681 |
| 9 | *Negotiation* | 0.58902 | 0.57983 | 0.00919 |
| 11 | *Organization and information* | -0.78666 | -0.58513 | -0.20153 |
| 15 | *Power and interest* | -0.79895 | -0.5409 | -0.25805 |
| 23 | *Resources* | 0.38889 | 0.78502 | -0.39613 |
| 3 | *Conflict and crisis* | -0.66439 | -0.07764 | -0.58675 |
| 7 | *Governance, structure and processes* | -1.46798 | -0.85895 | -0.60903 |
| 21 | *Requirements and objectives* | -1.24506 | -0.60607 | -0.63899 |
| 16 | *Procurement* | -1.50125 | -0.57027 | -0.93097 |
| 29 | *Strategy* | -0.18632 | 0.76743 | -0.95375 |
| 1 | *Change and transformation* | 0.56598 | 1.5458 | -0.97981 |
| 25 | *Scope* | -0.85205 | 0.27279 | -1.12483 |
| 18 | *Quality* | -0.83284 | 0.5228 | -1.35564 |
| 2 | *Compliance, standards and regulations* | -1.67564 | -0.18933 | -1.48631 |
| 28 | *Stakeholder* | -0.26864 | 1.29211 | -1.56075 |
| 14 | *Plan and control* | -0.38527 | 1.57024 | -1.95551 |
| 6 | *Finance* | -0.97143 | 1.34726 | -2.31869 |
| 33 | *Time* | -1.52817 | 1.07113 | -2.5993 |

*Table C.0.16 Descending Array of Differences Between Factor 1 and Factor 3*

| Statement Number | Statement | Factor 1 | Factor 3 | Difference |
|---|---|---|---|---|
| 27 | *Self-reflection* | 0.10461 | -1.97572 | 2.08033 |
| 26 | *Self-management* | -0.07424 | -1.96296 | 1.88872 |
| 31 | *Teamwork* | 1.06924 | -0.79907 | 1.86832 |
| 32 | *Threat* | 0.6043 | -1.1133 | 1.7176 |
| 3 | *Conflict and crisis* | -0.66439 | -1.68819 | 1.0238 |
| 8 | *Leadership* | 1.59578 | 0.644 | 0.95178 |
| 1 | *Change and transformation* | 0.56598 | -0.38448 | 0.95047 |
| 13 | *Personal integrity* | -0.13708 | -0.8305 | 0.69342 |
| 34 | *Vision* | 0.72582 | 0.04726 | 0.67857 |
| 24 | *Results orientation* | 0.93686 | 0.3225 | 0.61436 |
| 30 | *Taking the initiative* | 1.30932 | 0.81751 | 0.49181 |
| 22 | *Resourcefulness* | 1.10291 | 0.70378 | 0.39913 |
| 5 | *Culture and values* | -0.2174 | -0.60878 | 0.39138 |
| 19 | *Relationships and engagement* | 0.72324 | 0.37503 | 0.34821 |
| 17 | *Project design* | -0.18936 | -0.33863 | 0.14927 |
| 23 | *Resources* | 0.38889 | 0.24943 | 0.13947 |
| 2 | *Compliance, standards and regulations* | -1.67564 | -1.78608 | 0.11044 |
| 4 | *Creativity* | 1.88731 | 1.91534 | -0.02804 |
| 10 | *Opportunity* | 2.03423 | 2.0895 | -0.05527 |
| 9 | *Negotiation* | 0.58902 | 0.75104 | -0.16202 |
| 20 | *Reliability* | -0.02767 | 0.21728 | -0.24495 |
| 29 | *Strategy* | -0.18632 | 0.11952 | -0.30583 |
| 18 | *Quality* | -0.83284 | -0.43221 | -0.40063 |
| 14 | *Plan and control* | -0.38527 | 0.07881 | -0.46408 |
| 12 | *Personal communication* | 0.1729 | 0.6667 | -0.4938 |
| 7 | *Governance, structure and processes* | -1.46798 | -0.69139 | -0.77659 |
| 6 | *Finance* | -0.97143 | -0.17104 | -0.80039 |
| 11 | *Organization and information* | -0.78666 | 0.06358 | -0.85024 |
| 15 | *Power and interest* | -0.79895 | 0.20399 | -1.00294 |
| 16 | *Procurement* | -1.50125 | -0.15443 | -1.34682 |
| 28 | *Stakeholder* | -0.26864 | 1.18036 | -1.449 |
| 33 | *Time* | -1.52817 | 0.14268 | -1.67085 |
| 25 | *Scope* | -0.85205 | 1.36026 | -2.21231 |
| 21 | *Requirements and objectives* | -1.24506 | 0.98825 | -2.23331 |

*Table C.0.17 Descending Array of Differences Between Factor 2 and Factor 3*

| Statement Number | Statement | Factor 2 | Factor 3 | Difference |
|---|---|---|---|---|
| 1 | *Change and transformation* | 1.5458 | -0.38448 | 1.93028 |
| 31 | *Teamwork* | 0.93479 | -0.79907 | 1.73387 |
| 3 | *Conflict and crisis* | -0.07764 | -1.68819 | 1.61055 |
| 2 | *Compliance, standards and regulations* | -0.18933 | -1.78608 | 1.59675 |
| 6 | *Finance* | 1.34726 | -0.17104 | 1.5183 |
| 14 | *Plan and control* | 1.57024 | 0.07881 | 1.49143 |
| 18 | *Quality* | 0.5228 | -0.43221 | 0.95501 |
| 33 | *Time* | 1.07113 | 0.14268 | 0.92845 |
| 32 | *Threat* | -0.21944 | -1.1133 | 0.89386 |
| 29 | *Strategy* | 0.76743 | 0.11952 | 0.64791 |
| 23 | *Resources* | 0.78502 | 0.24943 | 0.5356 |
| 8 | *Leadership* | 0.99997 | 0.644 | 0.35597 |
| 27 | *Self-reflection* | -1.6409 | -1.97572 | 0.33483 |
| 28 | *Stakeholder* | 1.29211 | 1.18036 | 0.11175 |
| 10 | *Opportunity* | 1.97742 | 2.0895 | -0.11208 |
| 26 | *Self-management* | -2.09492 | -1.96296 | -0.13196 |
| 7 | *Governance, structure and processes* | -0.85895 | -0.69139 | -0.16756 |
| 9 | *Negotiation* | 0.57983 | 0.75104 | -0.17121 |
| 34 | *Vision* | -0.24973 | 0.04726 | -0.29698 |
| 17 | *Project design* | -0.6368 | -0.33863 | -0.29817 |
| 16 | *Procurement* | -0.57027 | -0.15443 | -0.41585 |
| 5 | *Culture and values* | -1.03377 | -0.60878 | -0.42499 |
| 22 | *Resourcefulness* | 0.25973 | 0.70378 | -0.44406 |
| 11 | *Organization and information* | -0.58513 | 0.06358 | -0.64871 |
| 13 | *Personal integrity* | -1.55126 | -0.8305 | -0.72076 |
| 12 | *Personal communication* | -0.07722 | 0.6667 | -0.74392 |
| 15 | *Power and interest* | -0.5409 | 0.20399 | -0.74489 |
| 24 | *Results orientation* | -0.53452 | 0.3225 | -0.85702 |
| 30 | *Taking the initiative* | -0.09662 | 0.81751 | -0.91412 |
| 25 | *Scope* | 0.27279 | 1.36026 | -1.08747 |
| 20 | *Reliability* | -1.12377 | 0.21728 | -1.34105 |
| 19 | *Relationships and engagement* | -0.98099 | 0.37503 | -1.35602 |
| 21 | *Requirements and objectives* | -0.60607 | 0.98825 | -1.59432 |
| 4 | *Creativity* | -0.25806 | 1.91534 | -2.17341 |

# Appendix D: Q Survey Data

This appendix provides a detailed overlook of the data collected from the Q-methodology survey. As the survey was conducted anonymous, all of the participant's data is associated with a computerized study code. Following, you can find the participant code written next to the participant number. The surveys are first sorted based on perspectives and further based on the role in the organization.

## Perspective 1

**Participant 1** A mix of both roles (9XB6)

Card No. 34: *Vision (+3):*

NA

Card No. 1: *Change and transformation (+2)*

NA

Card No. 3: *Conflict and crisis (+2)*

NA

Card No. 29: *Strategy (+2)*

NA

Card No. 2: *Compliance, standards and regulations (-3)*

NA

Card No. 11: *Organization and information (-2)*

NA

Card No. 14: *Plan and control (-2)*

NA

Card No. 33: *Time (-2)*

NA


*Any other competencies besides the 33 competencies were mentioned.*

*NA*


*Other factors influencing opportunity management in a project*

*NA*


*How would entrepreneurial competencies help project managers to become better at opportunity management?*

Important is the culture in which they thrive, how management appreciates their actions and results, long term


**Participant 2** A mix of both roles (HX5L)

Card No. 10: *Opportunity: (+3)*

For opportunity management you need opportunity as a competence.


Card No. 22: *Resourcefulness (+2)*

*P*rioritizing different task could result in opportunities


Card No. 30: *Taking the initiative (+2)*

Initiative is important for discovering new business opportunities


Card No. 19: *Relationships and engagement (+2)*

Relationship with other stakeholders could help develop new business opportunities


Card No. 21: *Requirements and objectives (-3)*

No reason

Card No. 7: *Governance, structure and processes (-2)*

No reason

Card No. 16: *Procurement (-2)*

Does not add any value to opportunities

Card No. 20: *Reliability (-2)*

Does not relate to opportunities

*Any other competencies besides the 33 competencies were mentioned.*

I think you have covered the most relevant and important ones.

*Other factors influencing opportunity management in a project*

Location- can have both positive as well as a negative influences on the process
Traditional ways of working- can have a negative influence on the process
Knowledge- can influence in both ways
Environment- can influence in both ways

*How would entrepreneurial competencies help project managers to become better at opportunity management?*

It will change the mindset of project managers who generally stick to the set standard procedures and work according to the project needs.
It will help them to move out of their comfort zone and think of ways that can add value to the project.
Having a long-term perspective rather than short term.
Help them become a good leader.

**Participant 3** Business Developer (2ZZM)

Card No. 8: *Leadership (+3)*

Good leadership will encourage entire team to highlight opportunities.

Card No. 4: *Creativity (+2)*

NA

Card No. 10: *Opportunity (+2)*

NA

Card No. 22: *Resourcefulness (+2)*

NA

Card No. 33: *Time (-3)*

Time is a constraint

Card No. 2: *Compliance, standards and regulations (-2)*

NA

Card No. 15: *Power and interest (-2)*

NA

Card No. 16: *Procurement (-2)*

NA

*Any other competencies besides the 33 competencies were mentioned.*

NA

*Other factors influencing opportunity management in a project*

stakeholders and organizational setup

*How would entrepreneurial competencies help project managers to become better at opportunity management?*

NA

**Participant 4** Business Developer (AT45)

Card No. 10: *Opportunity: (+3)*

By name and definition, itself showcase importance for opportunity management.

Card No. 4: *Creativity (+2)*

Creating new opportunities require creativity.

Card No. 24: *Results orientation (+2)*

Result orientation is important because of that you will stay focused towards results and exploit opportunities for achieving that result.

Card No. 23: *Resources (+2)*

defining resources could help find potential opportunities.

Card No. 25: *Scope (-3)*

It is a limiting factor towards Opportunity management

Card No. 33: *Time (-2)*

Constraint towards Opportunity Management

Card No. 2: *Compliance, standards and regulations (-2)*

Constraint towards Opportunity Management

Card No. 21: *Requirements and objectives (-2)*

Constraint towards Opportunity Management

*Any other competencies besides the 33 competencies were mentioned.*

NA

*Other factors influencing opportunity management in a project*

Many. biggest one is the industry constraints.

*How would entrepreneurial competencies help project managers to become better at opportunity management?*

Provide them with flexible thinking.

**Participant 5** Business Developer (B2L5)

Card No. 10: *Opportunity: (+3)*

For improving opportunity management opportunity competency is most important.

Card No. 1: *Change and transformation (+2)*

By bringing people together one can recognize opportunities there.

Card No. 4: *Creativity (+2)*

Creative ideas are very important for creating new opportunities.

Card No. 32: *Threat (+2)*

Knowing threats could help create opportunities. It is a good Idea to create opportunity out of threats.

Card No. 13: *Personal integrity (-3)*

not sure why dis i rate it, but is not very much related to opportunity management.

Card No. 3: *Conflict and crisis (-2)*

Not related to opportunity management.

Card No. 16: *Procurement (-2)*

Not related to opportunity management.


Card No. 18: *Quality (-2)*

Not related to opportunity management.


*Any other competencies besides the 33 competencies were mentioned.*

NA


*Other factors influencing opportunity management in a project*

The field of work or industry itself might be a limiting factor.


*How would entrepreneurial competencies help project managers to become better at opportunity management?*

Entrepreneurial competencies are what makes a great entrepreneur. Working on that could help project managers look at projects from entrepreneurs point of view and discover opportunities.


**Participant 6** Project Manager (6YDQ)

Card No. 30: *Taking the initiative (+3):*

self-explanatory


Card No. 10: *Opportunity (+2)*

Self-explanatory


Card No. 8: *Leadership (+2)*

Leadership is important to motivate others and create more opportunities

Card No. 4: *Creativity (+2)*

Creativity will bring more opportunities


Card No. 6: *Finance (-3)*

It could limit opportunities


Card No. 26: *Self-management (-2)*

No answer


Card No. 11: *Organization and information (-2)*

Limiting competency


Card No. 7: *Governance, structure and processes (-2)*

Limiting competency


*Any other competencies besides the 33 competencies were mentioned.*

NA

*Other factors influencing opportunity management in a project*

NA

*How would entrepreneurial competencies help project managers to become better at opportunity management?*

NA



**Participant 7** Project Manager (865U)

Card No. 4: *Creativity (+3)*

NA


Card No. 30: *Taking the initiative (+2)*

NA

Card No. 33: *Time (+2)*

NA

Card No. 34: *Vision (+2)*

NA

Card No. 6: *Finance (-3)*

NA

Card No. 5: *Culture and values (-2)*

NA

Card No. 20: *Reliability (-2)*

NA

Card No. 27: *Self-reflection (-2)*

NA

*Any other competencies besides the 33 competencies were mentioned.*

NA

*Other factors influencing opportunity management in a project*

NA

*How would entrepreneurial competencies help project managers to become better at opportunity management?*

the awareness

**Participant 8** Project Manager (R6YT)

Card No. 27: *Self-reflection (+3)*

NA


Card No. 4: *Creativity (+2)*

NA


Card No. 10: *Opportunity (+2)*

NA


Card No. 22: *Resourcefulness (+2)*

NA


Card No. 2: *Compliance, standards and regulations (-3)*

NA


Card No. 5: *Culture and values (-2)*

NA


Card No. 29: *Strategy (-2)*

NA


Card No. 33: *Time (-2)*

NA

*Any other competencies besides the 33 competencies were mentioned.*

Communication card: I would place it at +2. In a project where multi-cultural and multi-lingual personals are working. This factor is key to the project.

*Other factors influencing opportunity management in a project*

Cost overruns and delays can have a negative impact on opportunity management.

*How would entrepreneurial competencies help project managers to become better at opportunity management?*

Entrepreneurial competencies can help to identify when an opportunity arise during the project time.

**Participant 9** Project Manager (WI6T)

Card No. 8: *Leadership (+3):*

Team and stakeholders should be willing to think about and accept opportunities. This needs "power" from the PM.

Card No. 4: *Creativity (+2)*

 NO

Card No. 24: *Results orientation (+2)*

NO

Card No. 30: *Taking the initiative (+2)*

NO

Card No. 7: *Governance, structure and processes (-3)*

In governmental projects for their organisation, rules seem to be more important than result.

Card No. 2: *Compliance, standards and regulations (-2)*

NO


Card No. 16: *Procurement (-2)*

 NO


Card No. 33: *Time (-2)*

 NO


*Any other competencies besides the 33 competencies were mentioned.*

NA


*Other factors influencing opportunity management in a project*

Possibilities fore creating positive image for organisations.


*How would entrepreneurial competencies help project managers to become better at opportunity management?*

NA

**Participant 1** A mix of both roles (O467)

Card No. 31: *Teamwork (+3)*

NA

Card No. 23: *Resources (+2)*

NA

Card No. 25: *Scope (+2)*

NA

Card No. 33: *Time (+2)*

NA

Card No. 15: *Power and interest (-3)*

NA

Card No. 11: *Organization and information (-2)*

NA

Card No. 27: *Self-reflection (-2)*

NA

Card No. 30: *Taking the initiative (-2)*

*Any other competencies besides the 33 competencies were mentioned.*

NA

*Other factors influencing opportunity management in a project*

NA

*How would entrepreneurial competencies help project managers to become better at opportunity management?*

**NA**

**Participant 2** A mix of both roles (UP7W)

Card No. 14: *Plan and control (+3)*

For any project, planning is important but it always does not go according to the plan.So a combination of planning & control is essential for any project.

Card No. 2: *Compliance, standards and regulations (+2)*

For a project to run without much hindrance compliance, standards and regulations are necessary.

Card No. 24: *Results orientation (+2)*

Results are the reason that shows the project is running in the right direction. So this is necessary.

Card No. 8: *Leadership (+2)*

Without leadership, the entire project can be delayed due to a lack of proper guidance and planning.

Card No. 26: *Self-management (-3)*

If everyone has a different self managmenet setiing, it will lead to issues in a team.

Card No. 17: *Project design (-2)*

This project design card attributes are mostly covered in the stakeholder (card no 28) and power & interest card (card no 15)

Card No. 12: *Personal communication (-2)*

This is important and a standard measure for any activity. It does not have a big impact on the project.

Card No. 13: *Personal integrity (-2)*

This is not relevant for a project setup.

*Any other competencies besides the 33 competencies were mentioned.*

NA

*Other factors influencing opportunity management in a project*

Communication can positively influence the process of opportunity management.

*How would entrepreneurial competencies help project managers to become better at opportunity management?*

The freedom to let their creativity flow into their work

**Participant 3** Business Developer (CFQM)

Card No. 28: *Stakeholder (+3)*

It is critical to manage needs and engage the appropriate stakeholders at the appropriate stages of the project. This will help reduce the conflicts arising in the project process.

Card No. 6: *Finance (+2)*

Financing plays an important role in order to realize the project within the set budget.

Card No. 1: *Change and transformation (+2)*

Change and transformation should be an ongoing process, if you are not able to change according to the market & trends then you won't be able to compete and build a strong business.

Card No. 10: *Opportunity (+2)*

With regards to the research, it is important to identify and analyze the opportunities that will add value to the project.

Card No- 26: *Self-management (-3)*

This is more towards personal development & is less important for project development.

Card No. 13: *Personal integrity (-2)*

There are many people involved in the project with different cultural backgrounds and ethical beliefs. Aligning personal integrity is not a good solution and will take a lot of time to do so.

Card No. 4: *Creativity (-2)*

Developing creative ideas will only work if it is feasible for a particular project and if the project requirements ask for it.

Card No. 5: *Culture and values (-2)*

Culture and values- same as the first point

*Any other competencies besides the 33 competencies were mentioned.*

Ambidexterity (+1) - the ability of an organization to keep a balance between exploring new opportunities and exploiting current opportunities and knowledge is key for successful opportunity management.

Openness (+2) - The organization should be flexible and open enough to new ideas and perspectives to enhance its opportunity management competency.

*Other factors influencing opportunity management in a project*

Coordination and collaboration of the team, Diversity in expertise within the team can positively impact the opportunity management process.

*How would entrepreneurial competencies help project managers to become better at opportunity management?*

Entrepreneurial competencies prepare the project managers to handle risk and uncertainties and observe the opportunities from a holistic perspective.

**Participant 4** Business Developer (SWCE)

Card No. 1: *Change and transformation (+3)*

It is important and quite vital to adapt to emerging changes. The quicker one adapts to these changes, they can then assess the new developments that took place because of the change which in turn will help them in identifying possible opportunities that can be exploited.

Card No. 10: *Opportunity (+2)*

Identifying and assessing opportunities can be considered one of the important steps for opportunity management.

Card 33: *Time (+2)*

Opportunity exploited at the right time is what entrepreneurs need to be good at.

Card 8: *Leadership (+2)*

Right Leadership skills are quite vital when it comes to leading your organization towards an opportunity.

Card 2: *Compliance, standards and regulations (-3)*

Couldn't relate this to opportunity management

Card 7: *Governance, structure and processes (-2)*

Doesn't quite link with opportunity

Card 5: *Culture and values (-2)*

It is about an individual's own approach which may or may not affect the opportunity management part

Card 18: *Quality (-2)*

Controlling quality should be the aim for the whole project not just when exploiting opportunities.

*Any other competencies besides the 33 competencies were mentioned.*

NA

*Other factors influencing opportunity management in a project*

workplace, team culture

*How would entrepreneurial competencies help project managers to become better at opportunity management?*

They could help them bring more opportunities to the organization.

**Participant 5** Business Developer (WDT5)

Card No.10: *Opportunity (+3)*

Identifying and assessing an opportunity is the primary step that defines opportunity management. Challenging one's observation capacity paves the way to find new opportunities and management in due course of project completion.

Card No. 11: *Organization and Information (+2)*

Defining and allocating roles and responsibilities in a team/organization enhances the effectiveness of their output. Moreover, updating the team members with information provides a direction, freedom, and clarity to explore opportunities.

Card No. 14: *Plan and Control (+2)*

The uncertainty in the market leads to a varied level of opportunities (both upside and downside). The ability of an organization to adapt to these changes shows its capacity to explore and exploit opportunities they encounter.

Card No. 23: *Resources (+2)*

Set of tools and are required to materialize any opportunity. Clear understanding of the resources available, their strategic usability and technical expertise is required for exploiting the opportunities and its management.

Card No. 27: *Self-Reflection (-3)*

Weighing individual preferences and emotion can be roadblocks.

Cards No. 25: *Scope (-2)*

Exploring opportunity encounters a vulnerability of scope in terms of resources and output at different stages. Hence a clearly defined scope at the beginning of opportunity management is not a correct measure.

Cards No. 13: *Personal Integrity (-2)*

Moral values and principles contribute less while working in opportunity management. They might hinder the effectiveness of opportunity management.

Card No. 32: *Threat (-2)*

Identifying opportunities should be valued more than identifying threats. The team should be more prepared to materialise opportunities rather than checking the threats.

*Any other competencies besides the 33 competencies were mentioned.*

Technical Soundness = +1

*Other factors influencing opportunity management in a project*

The willingness of the company to venture into an uncharted territory

*How would entrepreneurial competencies help project managers to become better at opportunity management?*

Like with any other style of management, a well-rounded individual equipped with the right set of skills is principal in becoming better in opportunity management.

**Participant 6** Project Manager (CVTP)

Card No. 4: *Creativity (+3)*

As a Project Manager (PM), we are tasked with the responsibility of achieving our goals to better fit the cost, time & quality of the project. while focussing on these aspects, a PM with a high aptitude for creativity will find innovative ways to identify opportunistic risks.

Card No. 18: *Quality (+2)*

A PM should never compromise on the quality of the project. In the pursuit of finding opportunities, a competent PM would always access the quality of the proposed opportunistic risk.

Card No. 15: *Power and interest (+2)*

Having the right leverage and understanding of the power and interest of the company can benefit in identifying opportunistic risks.

Card No. 1: *Change and transformation (+2)*

Understanding the emerging trends is imperative in visualising opportunity management because one can find a novel path/method that could benefit in this ever-changing environment.

Card No: 27: *(-3)*

One needs to look beyond their self to capture an ideal opportunity

Card No. 20: *Reliability (-2)*

Reliability does not help in recognizing opportunity management. This competency involves benefitting teamwork within a project.

Card No. 24: *Results orientation (-2)*

Focusing on the results does not spark creativity and thus does not give more room to explore opportunities

Card No. 17: *Project design (-2)*

The project design limits the scope of innovation

*Any other competencies besides the 33 competencies were mentioned.*

NA

*Other factors influencing opportunity management in a project*

NA

*How would entrepreneurial competencies help project managers to become better at opportunity management?*

**NA**

## Perspective 3

**Participant 1** A mix of both roles (RVD4)

Card No. 4. Creativity: *(+3)*

Imagination is very important, not just believe what is written but think ahead, look aside (at other businesses), think about the purposes of the project and try to imagine how to reach the goals, what has been done already and what can possibly be adjusted

Card No. 9. Negotiation *(+2)*

Important that one is able to motivate the sense of an opportunity to a client

Card No. 33. Time *(+2)*

Important to be sure that the opportunity fits into the time goals of the project

Card No. 10: *Opportunity (+2)*

Opportunity is ofcourse important to identify opportunities

Card No. 27: *Self Reflection (-3)*

knowing your own + and -, is less important for opp. man.

Card No. 3: *Conflict and crises (-2)*

Acting in conflict situations may give opportunities, but in a normal situation one tries to avoid conflicts, for instance by listening well and strive to fulfill the project objectives

Card No. 2 *Compliance, standards and regulations (-2)*

Card No. 7:

*Governance, structure and processes*

*(-2)*

Not important for opportunity mgmt., but later on, when the client wants to implement the opp. this has to fit.

*Any other competencies besides the 33 competencies were mentioned.*

curiosity, +2
ownership (for the project result), +2

*Other factors influencing opportunity management in a project*

the possibility to communicate with the client (positive)
shortage of time and/or money (negative)

*How would entrepreneurial competencies help project managers to become better at opportunity management?*

When PM's are/act like entrepreneurs they look further then just controlling the project. They don't look just at the contract, but to the purposes of a project. Clients like that and there is a fair chance that they will be interested.

**Participant 2** Business Developer (8F27)

Card No. 12: *Personal communication* (+3)

NA

Card No. 1: *Change and transformation (+2)*

NA

Card No. 2: *Compliance, standards and regulations (+2)*

NA


Card No. 11: *Organization and information (+2)*


Card No. 9: *Negotiation (-3)*

NA


Card No. 6: *Finance (-2)*

NA


Card No. 15: *Power and interest (-2)*

NA


Card No. 25: *Scope (-2)*

NA


*Any other competencies besides the 33 competencies were mentioned.*

NA


*Other factors influencing opportunity management in a project*

NA


*How would entrepreneurial competencies help project managers to become better at opportunity management?*

NA


**Participant 3** Business Developer (MY2O)

Card No. 10: *Opportunity: (+3)*

This exactly dicribes what an opportunity manager should do. However, the questions are: WHY focus on this opportunity and HOW to do it. Very important: assesment/selction of must-win opportunities, as such we utalize our resources (time, money, fte) wisely

Card No. 19: *Relationships and engagement (+2)*

It's is cruscial that we know the clients DMUs wrt the opportunity. So they can tell use usefull information and we can influence them

Card No. 21: *Requirements and objectives (+2)*

It's crucial to understand the clients objectives and requirement of the subject opportunity. so we can act upon

Card No. 17: *Project design (+2)*

To me, this is the next step after card no 21: we know clients objectives and requirements. As such we are able to position ourselfs timely (eg; gather best team, define tender-strategy, gather relevant innovations, understand the competition)

Card No. 2: *Compliance, standards and regulations (-3)*

This is not relevant in this stage. This will get more important during tendering

Card No. 34: *Vision (-2)*

Vision is highly overrathed. I would rather have a aseesment of must wins that are in line with internal startegy.

Card No. 18: *Quality (-2)*

This is not really relevant in this stage. When we'll get to the next fase (tendering) this will get more important

Card No. 3: *Conflict and crisis (-2)*

It would be very strange to have a conflict already during opportunity phase.

*Any other competencies besides the 33 competencies were mentioned.*

+3 sense of priority and discipline: It is crucial that line mangement acknowledge opportunity mangement as a crucial step towards a winning tender! we have a lot of opportunities in our CRM system. it will require discipline of the opportunity manager  to seek information and talk to the client

+3 organisational-network sensitivity: sure, you can form a strong cleint-relationship yourself. But you don't need to form a strong clientrelationship if a colluege already has a strong relationship with the specific client-DMU. But we need to know this!

+3 (recruitment of) DEDICATED commercial people (not technical project managers) who actually like to talk with the client and organise the commercial flow

*Other factors influencing opportunity management in a project*

to be clear; there ar 2 types of opportunity management!

1) cold/new opportunities: projects that are comming on the market in the near future
2) hot/recuirring opportunities: basically recognising additional work within a project for wich the client is willing to pay for

I personlly talk about No. 1.!!! this will reflect all my awnsers above!

Number 2 is just doing your work as a projectmanager

*How would entrepreneurial competencies help project managers to become better at opportunity management?*

do you job as project manager: talk to client and recognize opportunities when outside scope of the original contract

**Participant 4** Project Manager (BX9O)

Card no 4: *Creativity (+3)*

Creativity is essential to see opportunities.

Cards no 10: *Opportunity (+2)*

NA

Card No. 34: *Vision (+2)*

NA

Card No. 30: *Taking the initiative (+2)*

Have vision, take initiative and introduce the opportunity.

Card no 32: *Threat (-3)*

A threat will never be an opportunity.

Cards no 27: *Self-reflection (-2)*

NA

Card No. 3: *Conflict and crisis (-2)*

NA

Card No. 26: *Self-management (-2)*

Individual improving competencies are not interesting for opportunity management.

*Any other competencies besides the 33 competencies were mentioned.*

NA

*Other factors influencing opportunity management in a project*

The location of project, type of project, stakeholders engagement.

*How would entrepreneurial competencies help project managers to become better at opportunity management?*

Don't know exactly. But it will be helpful.

**Participant 5** Project Manager (N3W3)

Card No. 10: *Opportunity: (+3)*

If you are not able to recognize opportunities, you will never take the opportunities.


Card No. 2: *Compliance, standards and regulations (+2)*

NA


Card No. 24: *Results orientation (+2)*

NA


Card No. 30: *Taking the initiative (+2)*

NA


Card No. 13: *Personal integrity (-3)*

Personal Integrity is something that is a fundament to everything, to all the cards.


Card No. 26: *Self-management (-2)*

NA


Card No. 31: *Teamwork (-2)*

NA


Card No. 32: *Threat (-2)*

Too many cards to explain.


*Any other competencies besides the 33 competencies were mentioned.*

Entrepreneurial: the balance between trying to achieve an opportunity by taking a certain (calculated) risk. I thinks is an important one in opportunity management.


*Other factors influencing opportunity management in a project*

The most important factor is 'stakeholdermanagement'. In the end it is all people oriented work and decision making.

*How would entrepreneurial competencies help project managers to become better at opportunity management?*

Project managers are trained in eliminating risks and to operate within the scope provided. Often, by changing the scope (convince the client!) there are opportunities that will unlocked. So, 'shifting perspectives outside the project scope' is something that can in unlocking additional project potential.

**Participant 6** Project Manager (RVAV)

Card No. 25: *Scope (+3)*

NA

Card No. 11: *Organization and information (+2)*

NA

Card No. 21: *Requirements and objectives (+2)*

NA

Card No. 28: *Stakeholder (+2)*

NA

Card No. 26: *Self-management (-3)*

NA

Card No. 1: *Change and transformation (-2)*

NA

Card No. 17: *Project design (-2)*

NA

Card No. 27: *Self-reflection (-2)*

NA

*Any other competencies besides the 33 competencies were mentioned.*

Initiative & Pro-activity
Commercial skills

*Other factors influencing opportunity management in a project*

NA

*How would entrepreneurial competencies help project managers to become better at opportunity management?*

Actively approach potential clients

# Appendix E: Expert Validation

Following are the quesitons used and the answers obtianed from the expert valiadtion.

Part 1: Slides for commonalities in perspectives

1. During the survey analysis, I identified a few competencies that everyone rated very high and very low.
   a. Do you recognize the importance of these competencies for opportunity management in all types of projects?

Expert 1

> Opportunity: Yes
> Creativity: Yes
> Leadership: Yes

Expert 2

> Opportunity: Yes
> Creativity: Yes
> Leadership: Yes

Expert 3

> Opportunity: Yes. Opportunity is defining it, so it is very important for any risk. It kind of defining the role of a project manager, so definitely is important for any risk, it is a very general one.
> Creativity: Yes. You have to think outside the box when defining opportunities. So, definitely creativity is important.
> Leadership: Yes. Leadership is important as even after identifying opportunities, you have to take control and exploit them.

   b. Do you recognize the negligible importance of these competencies for opportunity management in all types of projects?

Expert 1

> Compliance, standards and regulations: Yes
> Government, structure and processes: Yes
> Self-management: No. If you want to be creative and have a leadership role you have to do self-management. I am surprised that it is rated one of the lowest. To implement and control things also you need to have self-management.

Expert 2

Compliance, standards and regulations: Yes
Government, structure and processes: Yes
Self-management: No. Project Mangers are busy with their work. And when you are too busy in the work and don't do self-management, it could lead to neglecting opportunities as they are not a requirement.

Expert 3

Compliance, standards and regulations: Yes. It is almost going in the opposite direction of being creative.
Government, structure and processes: Yes. Same as above.
Self-management: Yes. It is very important in general but not very relevant to opportunity management

2. Is this set of most and least important competencies complete, or do you recognize anything missing?

Expert 1

Opportunity management not only depends on individual competencies, but also circumstances. So, if people feel safe and secure and are not blamed for mistakes, then they will more easily try things out. You need a stable and socially safe environment. Leadership is of course very important as good leadership can help build a safe environment.

Expert 2

Resources: Managing resources is very important. At present you have war in Ukraine and oil and gas prices going up. So, managing resources could be very important for opportunity management.
Time: Management of time also plays a big role, because you need to have time to think about opportunities.

Expert 3

Requirements and Objectives: For opportunity also, you need to be considering the objective of the project and create opportunities that align with the objective of the project. It is the overarching goal.
Culture and values: The culture of project and the value of clients and RHDHV are important, as you will investigate the opportunities in that direction.
Finance: It is the incentive as you are trying to make more money from those opportunities.

Part 2: Slide showing a comparison between Project Manager and Business developer ratings

1. A comparison was made between the opinion of the project manager and the business developer, and a few differences were highlighted. Some competencies business developers found more important than project managers and vice versa. Do you recognize these differences in perspective? And what could be the reason behind these differences?

Expert 1

Yes, I can see the differences. BD are more involved in the front-end development of a project; they are often involved in conceptual or initiation phase. So, all of the competencies rated higher by project manager are not required in that phase. And all of those competencies of a project manager are used in later stage of a project. Project managers are not so involved in the explorative stage of a project. So, all of competencies rated higher by BD are the ones required in that exploratory phase of a project. In that phase you need to have an open mind and think outside the box.

Expert 2

Yes, I do recognize these differences. Most of the project managers work as technicians and management is a different kind of job, and we need to divide both of these. As a technician you want to solve a problem and finish your project in time. BD job is to think out of the box, and I guess that's why they rated them higher. Technician say it is either black or white, but BD go totally broader.

Expert 3

All of the things that BD rated higher are developed in their phase, so project manager does not have to deal with it and therefore they do not find it important. But BD have to work on it as they have to define the business itself.
BD have to look at the bigger picture, also looking into the vision of RHDHV.
Personal communication is important for all, I wonder my project manger and BD had different opinion on this.
On the right-hand side, all of these are useful in the project execution, therefore they find it important. These are project details and does not concern BD.

2. The list of competencies we used for this research was a mix of project manager and entrepreneurial competencies. It was noticed that business developers rated entrepreneurial competencies higher, and project managers rated project management competencies higher. As an entrepreneur's job is to discover and exploit the business opportunities, do you think we need to expand the project management competencies (including entrepreneurial competencies) in order to improve opportunity management in our projects?

Expert 1

I don't think that we need to expand the PM competencies list, but team up with BD and integrate their skills. I don't believe in project managers who can do anything and everything. Connecting the dots is here the answer.

Expert 2

It could help learning about these competencies, but a PM tries to deliver project to the client as they want. Normally we are doing our project at the last time, so we cannot go back and think about

creativity and that kind of limits our ability. So, maybe learning those competencies help in some limited case, as it is the other constricts that limits our ability.

Expert 3

Yes, it is always useful to have the two rules connect, share the competencies or capabilities. There should be some crossover.

3. Literature review and exploratory interviews suggest that project managers are good at exploiting opportunities, and entrepreneurs are good at discovering opportunities. At RHDHV, do you see any issues in handovers from business developers to project managers? Will it help if the business developer involves the project manager early on in the process (while working on creating a new business opportunity)?

Expert 1

Yes. They are living in their own bubble, so when they really start connecting, they could do better. BD should keep in mind that someone else needs to follow though on what he has discovered. And also phrase it and frame it in a way that someone can pick it up. Including PM early on in the process and BD should not leave too soon, to they need to work on a parallel track for a while.

Expert 2

I also see that problem. Because as a project manager is involve at a stage where he tries to manage risk and get the job done, but does not have enough possibility to explore opportunities. PM involvement in early stage could be helpful.

Expert 3

Yes of course we need to increase the overlap. We can learn a lot from each other. BD also do not consider the small details how project mangers work and they don't include that in there plan, which leads to unrealistic opportunities or unrealized gains.