MASTER THESIS

Exploring diversity in the project teams and how projects are affected

ANASTASIA DIMITRA KYRIAKOU
CME STUDENT - 5152429

TU Delft

Delft University of Technology

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GRADUATION COMMITTEE

Chairman: Prof. Dr. Hans Bakker
1st Supervisor: Dr. Ir. Marian Bosch-Rekveldt
2nd Supervisor: Dr. R.M. Robert Verburg

Department of Civil Engineering and Geosciences

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Summary

The construction industry is rapidly evolving, with increasing demands in a plethora of parameters, requiring skills and expertise from different functional backgrounds. Over the years, this has led to more diverse project teams. A high-level project performance is a matter of recognition of the diversity dimensions, aiming to maximize the performance of the team, and eventually of the project. However, the notion of diversity remains very broad and ill-defined, while the literature findings in the past indicate a mixture of positive and negative effects.

The objective of this research is to better define diversity, its dimensions and effects, and the ways in which projects are affected by it. This investigation will assist in the creation of a set of guidelines, which can be used to assess the current levels of diversity, and which will also lead to suggestions that minimize the negative and maximize its positive influence. To accomplish this, the research question is formulated as follows:

How are projects affected by diversity in the project teams?

Research design

The design of the research was divided in three phases. Firstly, an extensive literature review provided the insights of what is studied to date, the dimensions that are considered and the effects that are generated. In this way, a matrix that includes all diversity dimensions was created, categorizing them according to their visibility and job relatedness. Secondly, the knowledge gained through the literature review was tested in practice, by developing a questionnaire which explored the view of diversity and its effects in practice. The target group of respondents included project managers and team members that are involved in an ongoing or recently completed project. The analysis of the results gave the opportunity to adjust the diversity matrix using the updated information. In addition, the effects were coupled with the dimensions that trigger them, and the stronger relations were revealed. A statistical analysis discovered the statistically significant relationships and patterns between certain groups and dimensions or effects. This was followed by an evaluation process, aiming to better explain the findings and provide some insights in how certain conditions are managed. Ultimately, a set of guidelines was created about how projects can be positively affected by diversity.

Results

The diversity dimensions' matrix that was developed through the literature review assisted in the formation of the first, broad definition of diversity in literature. According to this definition, diversity in project teams encompasses all those characteristics that the team members bear and can differentiate them from others. These can be personal traits and characteristics like age, gender, physical attributes, language, nationality & origin, race & religion, family structure, sexual orientation, or political views, which are connected with the personality of an individual and affect the interpersonal relationships. Moreover, they can be characteristics and conditions that are closely related to the job, like the education & knowledge, the functional background, the experience, and the organizational and team tenure.

Five out of the six companies that were invited to participate in the survey accepted the invitation, leading to the collection of 74 survey responses. The statistical analysis of the responses led to the adjustment of the dimensions' matrix to make it more representative and up to date. The number of dimensions was decreased, by removing some of the visible dimensions that were considered either irrelative or not even present in the project teams. The diversity dimensions as shaped by the participants and that are mainly visible are: Age, Gender, Language and Nationality/Origin. The dimensions that are mainly job-related are: Education/Knowledge, Functional Background, Organizational Tenure, Team Tenure and Experience.

The investigation of the effects of diversity followed, along with their connection to the dimensions that mainly trigger them. The participants were asked to indicate the dimensions that mainly trigger each effect, leading to the creation of a cumulative table. As proved, effects are triggered by either the most present dimensions or by dimensions of special significance. These effects are the Task and the Process conflicts triggered by the Organizational Tenure dimension, the Innovation and the Decision-making effects, triggered by the Functional Background dimension, the Less Flexibility effect along with the Decision-making and the Team Cohesion & Coordination triggered by the Age dimension, the Relationship conflicts triggered by both the Gender and the Team Tenure dimensions, and finally the Cooperation effect, related to the Team Tenure dimension too. Most of the effects recorded do have a positive influence on the atmosphere of the team and the performance of the project, by achieving for instance better team cohesion and coordination, cooperation, decision-making and creativity. The two effects that proved to have a clearly negative influence are Relationship and Process Conflicts. By properly handing the diversity dimensions that trigger them, Team Tenure and Organizational Tenure respectively, the presence of these effects can be minimized.

Conclusions & Recommendations

As indicated in the findings, diversity should be further explored. The proposed guidelines can be used to recognize the levels of diversity in the project team and the effects that might be triggered. In this way, the ones that cause negative influence can be managed to boost the atmosphere of the project team and the project performance The process followed could be repeated by applying some alterations that will assist in the deeper investigation of the variables. For example, the implementation of the guidelines in real projects would verify or reject the findings, leading to the creation of a more extensive guidelines or even a framework for assessing and handling diversity. Similar research can also be designed, by changing the way the effects are defined. The evaluation process highlighted that some effects can be perceived in many ways, thus they should be well defined.

Professionals could also start applying the guidelines, aiming to recognize the mechanism and control the triggered effects efficiently. This is a basic observation and recommendation, since the evaluation process proved that even though the mechanism is recognized when presented to them, it was not realized in the project teams until now. Hence, team managers and members should be aware of this mechanism. Furthermore, the onboarding process followed by new employees and the team bonding are some aspects that should be handled carefully. Investing time and other resources related to these aspects should be among the priorities, since the influence on the team and project aspects is significant.

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1   Introduction

Even though each project has a unique character with special properties, and its categorization may be difficult, they all need to be managed properly. The first formal approach of project management as a distinctive field originates at the early missile and space programs from the 1950s. However, its roots can be traced even further back (Walker, 2015). The reasons that led to its evolution as a distinct discipline are the increase of projects' size and complexity, as well as the ineffectiveness of the existing tools and methods. Nowadays, the need for even better management approaches and tools, combined with an increased project complexity and dynamics, lead to a challenge that is not always successful (Sohi et al., 2016).

1.1   Context of the construction industry

The construction industry is an important and rapidly evolving industry. Increasing demands in project performance (functionally and aesthetically), time, costs, environmental and sustainability demands require multiple professionals to be working towards a common goal, lead to a similar evolution as the one of project management in general (Walker, 2015). At the same time, there is a higher prevalence of a multi-gender and multicultural workforce in project teams, while project management practice entails stronger integration and collaboration for the future. As a result, project teams are becoming more diverse, consisting of skills and expertise from different functional backgrounds. It is believed that more diverse teams are better able to tackle the needs of the project, with their performance to be increased (Edwards & Edwards, 2002). Nevertheless, the interaction and cooperation of the team members is influenced by their diverse characteristics, triggering tension and friction that influence the team performance. In this way, the project performance is affected. As a result, it is questionable to what extent more diverse project teams deliver better project performance (Wu et al., 2019).

Usually, due to the broader perspective and the higher adaptation to changes that diverse teams have and need, such teams potentially increase project performance (Mahalingam & Levitt, 2007). For this to be achieved, the project manager has to be able to recognize the different types of diversity, the advantages and the drawbacks of these types, and of course, to choose properly among the various management techniques and approaches, the ones that will maximize team and project performance. To tackle this practical problem a set of guidelines should be designed, including the aspects that are not yet identified for the process and construction industries.

1.2   Research objectives

Based on the fact that teams in process and construction industries are usually diverse, with group members bearing diverse characteristics, knowledge, and experience (Ankrah, 2007), a high-level project performance is a matter of recognition of the diversity dimensions and consequently of the use of appropriate management tools and methods. In order for this to be achieved, the notion of diversity needs to be better defined and the respective tools that can be used to assess the various diversity dimensions need to be found.

This is a complex procedure, since the first literature findings illustrate the mixture of positive and negative effects of diversity (Pelled, 1996; Wu et al., 2019). For instance, conflicts are a mediating variable that needs to be considered, since they have both constructive and destructive effects. As a result, the desired goal is to better define diversity and to analyze and categorize the diversity dimensions, drawing conclusions on which of these dimensions affect the team and project performances more, and in which ways. In addition, having the maximization of project performance as a driver, it would be interesting to define any obstacles that homogeneity may create, for example the groupthink phenomenon (Raven, 1998), aiming to discover advantageous aspects of diversity that are not easily perceived.
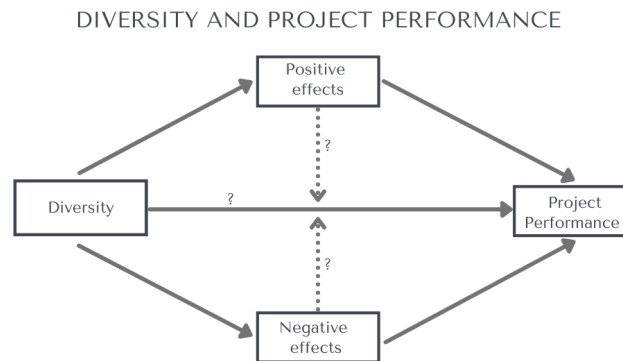
Figure 1.1 Connection between diversity, its effects and project performance

Another viewpoint that is essential in the research is the investigation of what the view of diversity in practice is. Along with diversity, its positive and negative effects and the way all of them are interrelated should be examined. Researchers in the past highlighted the importance of the attitude towards diverse teams and their management (Powers-Twichell & Murphy, 2011), consequently another parameter to be considered is the potentially subjective character of one or more diversity dimensions in practice, and to what extent this has an influence on the overall performance.

In conclusion, the research gap that currently exists and that this thesis targets to cover is the view of diversity both in literature and in practice, with a special attention on the empirical part, which will allow for the identification of the diversity dimensions and the ways in which it is handled. In this way, the results from the literature and the empirical data can be compared, to get a better view on the indicators that correlate the variables under examination and create a foundation for the proper management of the problematic aspects. Following that, a clearer view of how projects are affected will be possible.

1.3 Research Questions

The main research question is defined as follows:

How are projects affected by diversity in the project teams?

The main aim, a deep understanding of diversity as an independent variable in project teams, and the investigation of how this variable affects projects, outlines the research question. The model of thought through which a successful answer can be reached, leads to the introduction of four sub-questions, each of them addressing a different parameter of the main question.

Sub-question 1: What constitutes diversity in projects according to the literature?

The first sub-question constitutes the base of the research. Through an extensive literature review diversity and its dimensions will be defined. As a consequence, focus will be given to the dimensions that are related to project teams, their performance, and the ways in which this interaction can be balanced.

Sub-question 2: What are the types of diversity in projects in practice?

This second sub-question will act as a direct juxtapose between theory and practice. This will be achieved by making use of questionnaires completed by professionals. These questionnaires will be designed based on the literature findings, with the aim of getting insights on how diversity is perceived in practice. In this way an integrated approach of the concept of diversity will be reached.

Sub-question 3: How is diversity and its effects experienced in practice?

The third sub-question targets the examination of the effects that diversity creates. Improved problem solving, community relations and creativity are some of the positive effects that diversity promotes. However, some parameters like the mediating variable of conflicts tend to create negative effects that influence the processes and the progress of the project teams (Pelled, 1996; Wu et al., 2019). For this reason, both the positive and the negative effects will be analyzed based on existing literature, but also in practice. Semi-structured meetings with experts will delve deeper in the mechanism of how the effects are triggered. These expert meetings will not examine specific cases, but they will discuss experiences and incidents based on the survey findings, that will give the opportunity to draw conclusions and combine the practical findings with the theoretical ones.

Sub-question 4: How are the atmosphere of the project team and the performance of the project affected?

Ultimately, the examination of the atmosphere of the project team and the performance will assist in forming a clearer view on how projects are affected by more "soft" parameters such as diversity and its effects. For this reason, attention to these aspects and their influence on performances is essential. Additionally, the information that will be assessed in the evaluation process will examine those relationships between the variables.

1.4   Research Approach

The first analysis of the research question and the sub-questions indicates the research approach that is needed. Since the preliminary literature findings do not converge to one theory concerning the relationship between the variables (diversity, its positive and negative effects and team & project performances), an inductive approach will be followed to develop the set of guidelines. Of course, existing literature will be employed, but through the use of the questionnaire and the evaluation process, patterns and regularities that will be found will constitute the guidelines. The inductive approach is a method used to narrow down extensive and varied raw information, into a brief, summary format, through which links can be demonstrated that connect the research objectives to the findings from the raw data, ensuring the generalizability of the outcomes. A model or theory is produced, that

reaches the end goal of the research, as a result of the knowledge and experience produced (Thomas, 2003).

1.5 Overview of the phases

To get a clearer view of the approach, the whole research can be divided in three phases, consisting of four steps as illustrated in Figure 1.2. The first, essential step will be an extensive literature study into the role of diversity in the management of projects. The goal is to create an inventory with the literature findings on diversity dimensions and how they affect the relations and the outcomes, which will be the first indicators on how project performance is affected in general. Following this, the proposed measures to enhance the positive effects and to deal with the negative effects will be listed and stored for future use. The literature study will continue with the analysis of the effects, and of project performance. Concerning conflicts, which usually act as a mediating variable that triggers more negative effects, their types will be analyzed, and their subsequent effects in project teams will be addressed. Last but not least, project performance and its measurement through indicators will be defined, and the effect of the other variables on it will be analyzed. At the end of this step, which is the end of phase I, the base of the further analysis has been created.
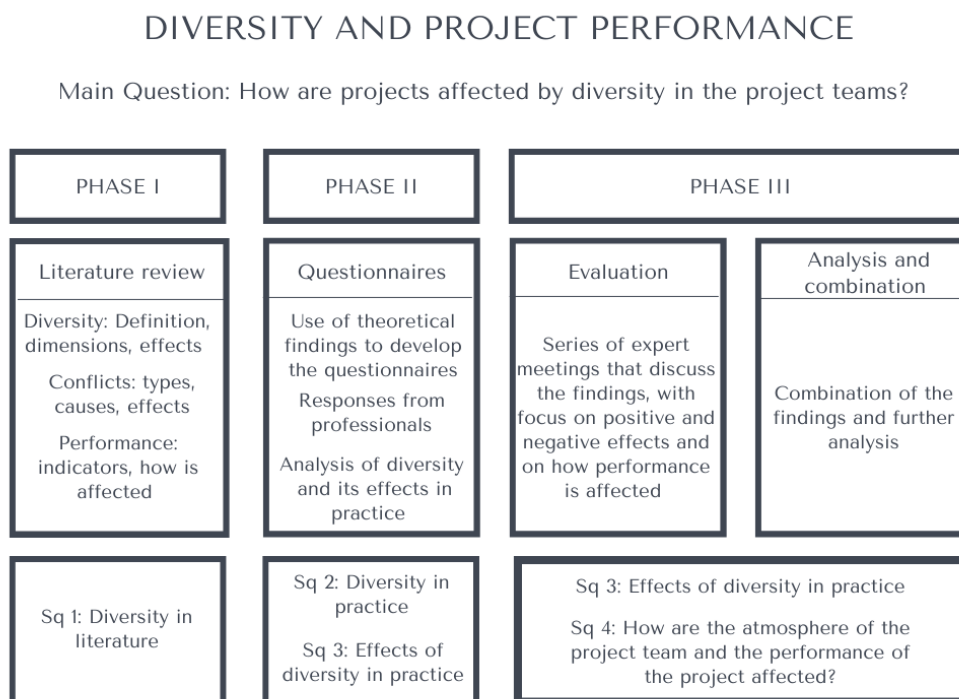
Figure 1.2 Research Approach

The next phase (phase II) targets the collection of data needed for two of the research sub-questions. A quantitative method, a questionnaire answered by experts in the field, will provide insights on what dimensions of diversity are present in practice, how they are perceived, and which of them have actual effects on project teams and on some of the performance indicators. The questionnaire will be comprised of both closed and open questions, to allow in this way more in-depth answers from the respondents. The participants will be professionals, project managers and members of project teams, who will provide their point of view and insights in their experience. The sampling size is expected to

be eighty to one hundred participants from different companies, which is considered enough to draw the desired conclusions on the view of diversity in practice, given that the questionnaire will be designed based on the literature findings (Walters, 2021).

The analysis of the results along with the theoretical findings will assist in the formation of the evaluation process, which is the first step of the third phase (phase III). In these expert meetings, the findings will be discussed, addressing the effects of diversity. The way in which these mediating variables act and affect the atmosphere of the project team and the performance of the projects will be also addressed. In this way the provided data will be conceptualized to explore the variables under-analysis and their relationships (Chenail, 2014). The plan is to conduct four evaluation meetings with experts of construction and consulting companies. The reasoning for choosing an evaluation process is the inductive character of the research, which will allow for a better understanding and for the creation of the guidelines. Furthermore, the sensitive nature of the questions could make professionals reluctant to share specific sensitive and detailed information for the project in which they participate or for some intragroup conflicts. The expert meetings will be semi-structured, to give the freedom to the experts to raise and discuss issues that for them are worth mentioning.

The analysis of the data gathered up to this point will be combined to investigate relationships between the diversity dimensions, the triggered effects and the atmosphere of the project team and the performance of the project.

1.6 Deliverables

The final deliverable of this thesis will be a set of guidelines, that will describe the relationships between the variables, starting from a complete definition of diversity and its dimensions, continuing with the effects that these dimensions create and leading to their influence on projects. The guidelines can be used as a tool for the recognition of the diversity level of a project team, the peculiarities that this condition might entail, and the first signs of how it can be properly managed for the maximization of project performance.

1.7 Structure of the thesis & Reading guide

The thesis is structured in a total of eight chapters, starting with the introductory chapter. In this chapter, the research objectives and questions are presented, followed by the overview of the phases that will lead to the response of the research question.

The main body commences in Chapter 2, with the literature review. In this chapter, the concept of diversity is examined, accompanied by an extensive presentation of the literature to date, and the collection of all diversity dimensions that are cited. Next, the effects observed are collected and presented, with a special attention to conflicts, their different types and eventually the different effects that they trigger. Since the goal is to examine how these effects reflect on project performance, a section is devoted to defining the elements that constitute project performance and consequently how it can be measured effectively. The last section of the chapter refers to the combination of the literature findings, in order to respond to the first research sub-question and create the base for the guidelines.

Chapter 3 begins with the introduction of the questionnaire and its content. First, the concept and the structure of it are described, based on the sections that were created. The line of thought that led to these sections is analyzed, to make the reader familiar with the survey. The validity of the survey and the data collection process are the main topics of the next sections.

After having described the theoretical part of the survey, Chapter 4 approaches the preliminary findings, with some first implications on how they are connected and how they should be handled. The statistical analysis is presented, with the statistically significant results being discussed. The end of the chapter concludes the findings, responds to the second sub-question, and organizes the way how they are managed for the evaluation process.

Chapter 5 addresses the evaluation process. Its conceptualization is analyzed, along with the main findings. These findings refer both to the aspects evolved from the survey, but also to new aspects that the experts revealed, which add value to the conclusions. Eventually, the chapter answers to the third and fourth sub-questions

In Chapter 6, the main body of the thesis ends by the discussion of the results and the proposal of the set of guidelines. These guidelines can be used to assess the existing diversity of a project team and the effects that can be triggered. Some points of attention are presented, which can assist in maximizing both the atmosphere of the project team and the performance of the project. At the end, the limitations of the research are analyzed to provide a complete picture to the reader.

In Chapter 7, the conclusions are presented. This assists in the proper outline of the whole research, that addresses the research question. Then, the recommendations for both the practice and the future studies are collected.

Finally, Chapter 8 acts as a reflection of the study and the process followed. This includes the initial expectations, the difficulties that arose and the ways in which they were dealt with.

Aiming to assist in the proper display of the findings, three Appendixes accompany the main body. Appendix A includes the survey questions which were analyzed using the Qualtrics software. Next, in Appendix B, part of the preliminary results is displayed, including the ones that were not presented in the research's main body. In addition, some representative tables from the statistical analysis are added, to provide visualized results. Finally, the summaries of the evaluation meetings constitute the Appendix C, which provides an overview of the evaluation discussions.

2 Literature review

The present chapter demonstrates the key points of the extensive literature review, reaching to the design of the diversity dimensions' matrix based on the literature findings. The matrix includes all dimensions that can be present in project teams, categorized as regards their visibility and their job-relatedness, reaching a broad definition of diversity and an overview of the main effects caused.

The literature review commenced by online search with the use of key words, for instance "diversity", "workforce diversity", "conflicts", "project performance", in engines like Google Scholar and Research Gate, and in international journals and institutes like the "Project Management Institute". Of course, knowledge gained during the courses of the MSc Construction Management & Engineering (for example "Intercultural Relations and Project Management" and "Dynamic Control of Projects") was crucial for recognizing behavioral phenomena and effects and triggered the search for more academic papers and books. Furthermore, references of the researchers, indicating past research with important findings were used to get a deeper understanding of the notions.

To sum up, the chapter begins with the examination of the notion of diversity in general, continues with an analysis of the dimensions considered, and the reasons why these dimensions were selected for extensive analysis in previous works. For a more interactive presentation of the key points, figures and tables are employed when needed. Following this, the effects analyzed by the researchers are presented and grouped in a table (Table 2.2) for further use. Moreover, the next two sections (2.4 and 2.5) deal with the notions of conflicts and project performance, aiming to create a solid base for the design of the guidelines. The last section of the chapter presents the dimensions' matrix, which concludes the theoretical findings and provides the answer of the first research sub-question.

2.1 Diversity

Over the last decades, there is a growing attention to team diversity, its characteristics and the positive or negative influence that it creates on a project's execution and consequently performance (Pelled, 1996). The research on psychological and social aspects like these is a new necessity, since studies have shown that a more integrated approach to project management that takes them into account is needed (Bakker & de Kleijn, 2014, 2018). Further research would provide more insights on how diversity dimensions interact and evolve to assist the managerial approaches and the procedures of the teams. As in other types of projects, projects teams in the construction field are usually comprised of a plethora of members with heterogeneities in their knowledge, expertise, values and skills. In addition, temporariness of teams is another parameter, which follows the project life-cycle. The interaction of these parameters with diversity that is present and their connection to group and project performance constitutes a dynamic mechanism which has not been fully investigated.

Earlier studies which were usually focusing on demographic diversity, tended to follow two different approaches for diversity; either considering it a broad mix, like heterogeneity, or by focusing on specific dimensions, since not all dimensions lead to same results (Pelled, 1996). According to the Cambridge Business English Dictionary diversity is defined as "the fact of there being people of many different groups in society, within an organization, etc.". What is meant by this is that team members

bear characteristics such as cognitive skills or personality traits along with their identity characteristics (age, race, gender, etc.) that differentiate them from the rest of the group. Regarding workforce diversity, it is the projection of this definition in the workplace and means similarities and differences among employees in terms of age, cultural background, physical abilities and disabilities, race, religion, gender, and sexual orientation (Saxena, 2014). Globally, there is a tendency of embracing diverse project teams in various fields, since despite the challenges that heterogeneity creates in the aim to form an integrated team, such teams are believed to be better at complex problem solving and design of innovative solutions (Edwards & Edwards, 2002). At the same time the proper management of this diversity within organizations and project teams is of critical importance (Watson, Johnson & Merritt, 1998).

Trying to identify the reasons why there is this global tendency creating this driving force towards diversity, the main parameter is globalization and its effects. The interdependent and constantly evolving global economy has forced organizations towards the highest performing workforce, leaving no room for discriminatory behavior in the recruitment process. This ensures that they remain competitive and keep making progress (Saxena, 2014). To this extent, equality parameters also contribute to this tendency. Considerable emphasis is given to promoting equal opportunities and eliminating gender or age inequalities (Armstrong et al., 2010), by creating more diverse workplaces, where everyone is equal and has equal opportunities. Nonetheless, the management of this diverse workforce is challenging, since a new balance has to be achieved, which will consider diversity and employee development and in which the organizational objectives will still be achieved (Saxena, 2014). Literature studies have also recognized that there is an influence of diversity on group interactions and outcomes and have tried to identify these relationships. Even though researchers define the concept of team diversity in different ways, there is a consensus that it is a multi-dimensional concept, encompassing a variety of heterogeneities (Wu et al., 2019).

2.2   Diversity dimensions

The multi-dimensional concept of diversity encompasses all those characteristics that differentiate individuals. This section presents how researchers approached the concept of diversity and the dimensions which they considered. An overview of these dimensions is presented in Table 2.1. Even though the dimensions and their concepts vary, the table attempts to roughly categorize them, by placing dimensions with a common root in the same row, for example Profession and Functional Background.

Powers-Twichell & Murphy (2011) supported the idea that diversity is everywhere and present in every team, because even in the most homogenous groups the members have different age, expertise, experience, and other characteristics that influence their way of thinking and working. To visualize their theory, they illustrated the diversity iceberg (Figure 2.1), in which some forms of diversity like race, age and gender are visible, and some other forms, for instance income, education and political views are not visible.
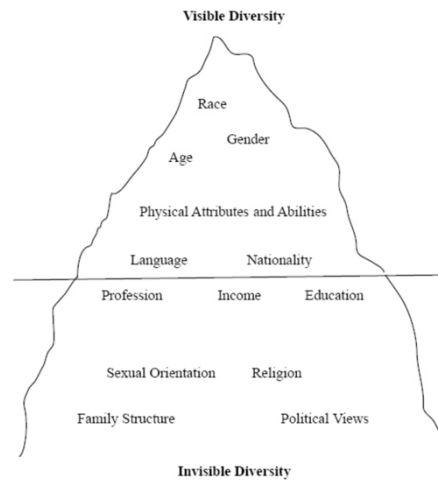
Figure 2.1 The diversity iceberg (Power-Twichell & Murphy, 2011)

Similarly, Saxena (2014) created a model that illustrates the workforce diversity dimensions. These are age, gender, different perceptions & attitude, caste & religion, language, experience, professional qualifications, and origins from different geographical locations. Pelled (1996), also created a model to examine how diversity predicts individual and team outcomes, with the dimensions considered to be age, gender, race, group tenure, organization tenure, education, and functional background. An interesting categorization that was made in this paper was that of visible and job-related dimensions. In this way, the dimensions that illustrate task perspectives and technical skills are grouped as job-related dimensions, while the rest of them that are not related to team tasks but are easily recognized are grouped as visible dimensions. The visible dimensions may not be directly related to the job procedures, however the rationale behind their recognition and categorization is based on their ability to affect the interpersonal relationships.

Table 2.1 Overview of diversity dimensions in previous studies

Powers-Twichell & Murphy, 2011	Saxena. 2014	Pelled, 1996	Ancona & Caldwell, 1992	Wu et al., 2019
Age	Age	Age		Value diversity
Gender	Gender	Gender		
Physical Attributes	Different Perception & Attitude			
Race / Religion	Caste & Religion	Race		
Language	Language			
Family Structure				
Sexual Orientation				
Political Views				
Profession	Experience	Functional Background	Mix of Functional Specialties	Knowledge Diversity
Income	Professional Qualification	Organization Tenure	Tenure (organizational)	
Nationality/Culture	Origin from different geographical location	Group Tenure		
Education		Education		

Furthermore, some researchers who studied diversity in project teams focused on few dimensions that were considered of particular importance. Ancona & Caldwell (1992) chose two broader dimensions,

the mix of functional specialties and on the organizational tenure. According to them, when professionals of different expertise constitute a group the direct access to this expertise facilitates the processes and provides useful insights, but at the same time the different ways of thinking and perceptions may create obstacles and difficulties in the development of a shared purpose. Similarly, organizational tenure, which refers to the timing when members joined the organization, is based on the fact that individuals who join an organization at the same time develop similar understandings and perceptions on the way of working and of social integration. Wu et al. (2019) considered two wider dimensions, value diversity and knowledge diversity. Value diversity refers to the cultural values of the members and their inclinations, that can affect the common goals, the prioritization of objectives and the social integration. Knowledge diversity, which is similar to the functional diversity that was previously mentioned, refers to the core knowledge characteristics, including profession, expertise and way of thinking.

After this overview of the main diversity dimensions and the ones that are appraised to be the most influential to team processes, it becomes clear that the concept of diversity is not univocal. Consequently, the categorization that some researchers perform, for instance the knowledge and the value diversity categories of Wu et al. (2019) or the visible and job-related categories of Pelled (1996), could be useful in this study.

2.3 Effects of diversity on team processes

Before analyzing and categorizing the diversity dimensions, it is essential to explore how these dimensions interact with each other, what their effects on the team processes and outcomes are, and how influential each dimension is. This procedure will assist in determining which dimensions are the most crucial, and by using this knowledge, diversity can potentially be scaled into high, medium, and low. For this reason, the main findings of the researchers related to the effects are presented in this section, while the main effects that are triggered are summarized in Table 2.2.

Ancona & Caldwell (1992), who analytically investigated the relationship between demography and performance, considered tenure diversity and functional diversity as their main dimensions. They also introduced two mediating variables, which are the task processes and the external communications. Task processes are all those procedures that aim at organizing members to get work done. Their effectiveness is linked to diversity because it increases conflicts, lowers cohesion and coordination, and constitutes internal communication more complex. On the contrary, external communications are enhanced by diversity, due to the wide range of expertise and contacts that these members have". There is more direct access to various networks, which facilitates external processes. The results showed that each demographic variable operates in different ways, and that there is a distinction between the direct and indirect effects of diversity. The direct effects have been found to be worse than the mediating effects and are all negative. Tenure diversity leads to more mild effects comparing to functional diversity. The reason behind this may be in terms of innovation for instance, that even though diversity brings more creative potential to problem-solving, progress is being impeded during implementation, because there is less flexibility and capability for teamwork.

Table 2.2 The effects caused by diversity

References: Ancona & Caldwell (1992), Pelled (1996), Wu et al. (2019), Watson, Johnson & Merritt (1998)

Effect	Description
Cohesion & Coordination	Because of conflicts, internal communications become more complex and lower cohesion and coordination
External Communications	Wider expertise and backgrounds increase the network
Creativity	More attitudes and experiences assist in a more creative way of working and finding solutions
Cooperation	The ability to cooperate can be either enhanced or reduced, due to the different ways of thinking
Innovation	Variety in the way of thinking leads to more innovative ideas and solutions
Decision-Making	Either enhanced due to constructive criticism, or impeded due to the difficulties in reaching a decision
Support of Complex Systems	Because of knowledge diversity, complex systems like the team are supported
Problem-Solving	Enhanced by the constructive character of conflicts and the various experiences and viewpoints
Task Conflicts	Their constructive character fosters the exchange of opposing views and creative criticism
	Enhance performance on cognitive tasks
Relationship Conflicts	Because of disagreements on interpersonal issues, leading to negative emotions, frustration, anxiety
Process Conflicts	Based on disagreements about the logistics of a task, are harmful since the real reason is deeper

Pelled (1996) created a model which examines the processes by which diversity predicts the individual and team outcomes, which were considered the team turnover and the team's performance on cognitive tasks. The research was related to demographic diversity and proposed that each demographic diversity variable can be classified according to its levels of visibility and of job-relatedness. Indeed, this classification is smart, since we should not focus on dimensions that are not visible or related, as they do not affect, or do affect but to a lesser extent the under-analysis outcomes. Visibility is the extent to which the team members can recognize and perceive the diversity dimension, while job-relatedness refers to the extent to which this dimension is involved and affects cognitive tasks that take place in the team. Hence, the seven diversity dimensions that were chosen are: Age, Gender, Race, Functional Background, Organizational Tenure, Group Tenure and Education. These were inserted and combined in a matrix that combines the two variables of visibility and job-relatedness.

The idea was that each of these two variables, visibility and job-relatedness, affect different parts of team's procedures and in different ways. Conflicts, that are introduced as mediating variable in the model, indirectly affecting performance. The intervening variable of the two-dimensional concept of conflict had a substantive component and an affective component, with each component affecting different aspects of team performance. In the model, after the classification of the diversity variables in the matrix, according to their job-relatedness and visibility, each one of these broader categories were related to one conflict component. This introduction of the conflict's two-dimensional concept is based on the constructive character that a conflict usually has, and which can prevent even negative results, if the conflict was absent. In this category falls the substantive conflict, in which the problem-solving procedure fosters debate over opposing positions. Such a desired constructive type of conflict

can actually prevent the overlook of important details and the groupthink phenomenon, which leads to catastrophic decisions i.e. the Bay of Pigs disaster (Raven, 1998). On the contrary, the affective component is closely related to negative emotions, such as frustration and anxiety. According to the researchers, the two components of conflict interact too, with the potentially positive effects of substantive conflicts to be restrained due to the presence of affective conflicts, which make people more resistant to new ideas and discussions of new or complex information.

Wu et al. (2019) included two diversity dimensions in their study: knowledge diversity and value diversity. In knowledge diversity basic knowledge heterogeneity between teams is contained, such as knowledge, expertise, and know-how backgrounds. Value diversity is related to the diversity of inclinations and of cultural values, including sharing common goals, the prioritization of project objectives and the consideration of the welfare of others. Through value diversity it is believed that tension and friction among the members increases, leading to more relationship conflicts, as well as task and process conflicts. In their study, it was found that knowledge diversity can assist in the support of complex systems like project teams, and in addition to the cooperative capability of the team. Cooperative capabilities seem to be positively related with value diversity too, along with creativity and better decision-making because of the multifaceted perspectives.

Watson, Johnson & Merritt (1998) studied the connection between team- and self-orientation and diversity in task groups. They highlighted the increased productivity of teamwork -in relation to individual work- in complex problem-solving and the importance of recognizing and coordinating the individual resources properly. Moreover, cultural diversity, even if it seems to increase process tasks, is advantageous if managed properly with frequent feedback that minimizes these task issues. Concerning the relationship between diversity and team performance, the duration of the tasks and the time to adjust play an important role. While diverse team members seem to have better ability to recognize the diversity differences and invest time and energy to increase team awareness and resolve interpersonal issues, these procedures require time, and consequently, if this time is available, diverse teams can perform better than non-diverse teams in early stages. Yet, these differences in performance between diverse and non-diverse teams have been shown to diminish over time. This finding was supported by the survey conducted using two large samples (226 participants in the first sample and 449 participants in the second) of student groups, which were characterized as diverse or non-diverse based on their nationality and ethnic backgrounds. Another important finding was that results were not impacted by age or gender. This indicates that the dimensions of age and gender do not have a significant influence on team processes and so on performance.

Another crucial parameter that affects the group processes is the attitude towards diversity, which influences our behavior as described by Powers-Twichell & Murphy (2011). It is often a matter of perspective and interaction, and not the diversity itself that promotes or impedes progress. Beliefs frequently drive someone's behavior, and this affects the team's procedures and results. At this point, both the role of the project manager and of the team's members are crucial.

2.4 Conflicts

Conflicts influence all projects to a greater or lesser extent. They emerge in every group of people due to their coexistence and interaction and need to be properly managed in order to avoid any undesirable influence on performance. The investigation of the different types of conflicts and their characteristics emerged due to the broader deployment of groups in organizations, which led to this need of determining the consequences of intragroup conflicts on group outcomes (de Wit, Greer & Jehn, 2012).

Intragroup conflicts appear through the perceived discordances or differences among the group members. Initially they were distinguished to task conflicts and relationship conflicts, but later the process conflicts category was added to better separate the incidents (Jehn, Northcraft, & Neale, 1999). Task conflicts are related to disagreements concerning the content and the outcomes of the task that is undertaken. Their effect on the group performance can be positive, by stimulating information processing and creativity, as they allow for productive disagreement and encourage feedback and testing of new ideas (Pelled, 1996). At the same time, they can hinder performance if they turn into emotional and personal conflicts. In this case the nature of the conflict is adjacent to the next type, relationship conflicts, in which disagreements refer to interpersonal issues and are not related to work, such as cultural and diversity issues or differences in norms and values (de Wit, Greer & Jehn, 2012). They are characterized by emotions such as frustration, anxiety, dislike, and other negative emotions (Pelled, 1996). Relationship conflicts generally hurt group performance (Wu et al., 2019), even though they can positively affect the relationship development, if properly managed. The third conflict type, process conflicts, concerns the disagreements about the logistics of a task, for instance the separation of responsibilities, and is considered to harm group performance, since the real issue behind the conflict is often deeper (e.g. fairness, respect) and its resolution can be complex (de Wit, Greer & Jehn, 2012).

The influence of conflicts and their connection to diversity has been investigated in the past. Pelled (1996), proposed the two-dimensional concept of conflicts, having a substantive and an affective component. These components were the task and the relationship conflicts, respectively. Although task conflicts usually have a constructive character, while relationship conflicts have a destructive character, it is also their interaction that is worth exploring. Indeed, the presence of both types of conflicts affects the outcomes of these conflicts. For example, the constructive effects of a task conflict may be minimized by the destructive effects of a relationship conflict that occurs at the same time. This may be the result of the hostility that is created during a relationship conflict, which will make the members less willing to accept and discuss new task-related ideas and proposals. In their study, Wu et al. (2019) related knowledge and value diversity to conflicts, because in a project team with heterogeneous knowledge, difficulties may arise during knowledge exchange due to different points of view. In addition, even though the negative effect of relationship conflicts and the positive effect of task conflicts were identified, the negative effects of the process conflicts could not be verified. The researchers mention that a potential reasoning for this finding may be that in construction projects, a task conflict is clarified before it is transformed into a process conflict, consequently worse outcomes are avoided. However, relationship conflicts not only have a clearly negative impact on the team's procedures and outcomes but are the strongest effects among the conflicts.

When examining relationship conflicts, it is interesting to investigate whether research and findings about them are sensitive to the culture on which the research focuses. For instance, Wu et al. (2019) executed their research in China, where society is highly emotional. It is evident that different cultures are making use of different patterns of thinking, feeling, and acting, which follow the people who belong to them in all aspects of their lives (Hofstede, 1991). In his theory, Hofstede (1991) studied the main problems that all societies face, leading to the creation of the initially four, and later six dimensions of cultures. One of these dimensions, power distance, refers to the extent to which the less powerful members of a society expect and accept the fact that power is distributed unequally. In countries where the power distance index is high, as for example the case of China (80), subordinate-superior relations are emotional. On the other hand, in countries with low power distance index, like The Netherlands (38), subordinate-superior relations are pragmatic. On that basis, relationship conflicts can emerge more in some cultures rather than others or can be related to an existing cultural diversity in the workspace. Of course, this also affects the subjectivity of the studies, which may lead to results that are culturally dependent.

Pelled (1996) also supported the idea that some dimensions are related to certain types of conflicts. Having categorized the diversity dimensions based on visibility and job-relatedness, she proposed that visibility-related dimensions could result in affective (relationship) conflicts, while job-related dimensions could result in substantive (task) conflicts. The difference between these hypotheses to the ones that Wu et al. (2019) have made is that they considered that both knowledge and value diversity are related to all conflict types and not to one type. It is evident that this connection of dimensions to respective conflict types is interesting and should be further investigated in order to reach more clear outcomes. Another point that seems to act as a parameter is the group longevity, the amount of time the group has spent in working together. The bond between diversity and conflicts seems to be weakened as the longevity time increases (Pelled, 1996). This happens because the relationships between the members evolve, and for this reason they have less tendency to categorize and stereotype visible diversity dimensions. Similarly, job-related dimensions that lead to different viewpoints and perceptions are becoming milder over time and evolve into more common understandings, which results into less task conflicts.

As mentioned earlier, conflicts act as intervening process on team's activities and actions (Pelled, 1996; Wu et al., 2019). Their effects can be both constructive and destructive, depending on the type, the causes and the ways used to manage them. Thus, it is important that they are taken into consideration along with the conclusions of the past studies.

2.5   Performance

Project performance is a notion that is defined in the front-end phase of the project, during which the ability to be influenced is maximum (Faniran, Love & Smith, 2000). For each project the performance indicators vary. The main indicators are usually time, cost, and quality, which constitute the 'iron triangle' (Samset & Volden, 2016), but environmental, ethical, legal, health and safety objectives are sometimes set as requirements that will constitute a project successful (Maylor, 2010). Other indicators that are set can be client satisfaction with the product or the service, defects, and productivity (Takim & Akintoye 2002). These indicators are the aftermath of a mixture of competences of different fields,

requiring and illustrating the need for managerial, financial, organizational, and technical competences. Therefore, it becomes clear that project performance is affected by multiple factors, and its success depends on the successful execution of the procedures required to realize the success criteria.

In addition, the stakeholders' viewpoint may affect the perceived performance. The more stakeholders are involved, the more perspectives and outcomes are expected, meaning that a project may be considered partially successful for one of the stakeholders, but partially unsuccessful for another since they prioritize differently the performance indicators and/or have different expectations according to their goals (Samset & Volden, 2016). Furthermore, the stakeholders' participation can accelerate or impede the planned project design and execution. The construction industry is an industry that is linked with the communities that interact with the projects, for instance the suppliers, meaning that good collaboration can optimize procedures and lead to successful outcomes and long-term partnerships.

When examining how these indicators are measured, it can be said that most indicators are result oriented, since their success is determined by the end result. Some other indicators like safety are process oriented, and the rest of them are procurement oriented, like the cost and time predictability both for the design and for the execution (Takim & Akintoye, 2002). This means that their success depends on the procurement of the project, which is the one that determines, through the procedures undertaken, the successfulness of such indicators. Ankrah (2007) describes this tendency of measuring performance during the construction/execution phase yet mentioning that in recent times interest has been also shifted towards pre-construction and operation phases. He also studied the prioritization that is made in these indicators in the construction industry in the UK and, surprisingly, cost was not the most important consideration. Health & Safety was ranked as the most important, followed by quality, cost, and time. Indeed, over the past decades health and safety in the workspace and especially in construction projects has become one of the main priorities (Bakker et al., 2010), aiming to eliminate accidents and unforeseen circumstances, a fact that also indicates that performance measurement is not only results-oriented, but also process-oriented.

Considering the variety of performance indicators and shifted interest from the exclusive interest in the time-cost-quality triangle, in this study the success criteria proposed by Bakker et al. (2010) are adopted. It is a set of six indicators, which are: no accidents, client satisfaction, budget, quality, schedule, and start-up. These criteria cover a variety of aspects and are considered to reflect the prevailing conditions of the construction industry. Success factors, which are also studied in the same research, and which influence one or more success criteria, have been found to be even more related to team and people management. Factors such as trust are being introduced, that illustrate the attention shifted to managing the people instead of managing the tools (Bakker et al., 2010). This focus onto the team and people management can also be an indicator that diversity influences success factors and consequently the total performance.

In general, diversity can be both positively and negatively associated with project performance. As Wu et al. (2019) mentioned, resource exchange and knowledge interaction are needed in systems like project teams, and that being the case, the varied insights and the knowledge range that are present in diverse teams positively contribute to the needs of a successful project. Nevertheless, in their conflict-

based model that was created representing the under-analysis mechanism, the result showed that higher levels of value diversity and knowledge diversity lead to all types of conflicts, but also contribute in many ways to project performance. This perception is related to the observation that task conflicts can be considered as constructive criticism, creating space for new ideas, opinions, and decisions, while at the same time the conflict does not evolve to a process conflict. On the other hand, process and relationship conflicts are the ones which have a negative impact on project performance, because the focus is often shifted to the interpersonal relationships, hindering the processes and the optimal performance. Despite the aspects and dimensions that seem to positively affect the desired outcomes, a wider picture shows that the destructive effects of the relationship conflicts were larger than the constructive effects that diversity promotes.

2.6   Conception of the first guidelines

It becomes clearer that there is a pattern that indicates the effects of diversity on team processes and on how the teams are affected. Even though there is a plethora of dimensions that can be present, their categorization is possible based on their nature and effects. Two broad categories in which the dimensions can be grouped are considered. The first is related to values, the personal and cultural characteristics, and inclinations. These are the dimensions that are not directly connected to the work and the team processes, but tend to increase tension and friction, leading to more relationship conflicts and affect the coordination and collaboration of the team members (Wu et al., 2019). As Pelled (1996) mentions, these dimensions are the visible ones and can be recognized and easily perceived. The second category includes all job-related dimensions, which directly affect the processes, such as decision-making, ability to solve complex problems and the cognitive tasks of the team. Ancona & Caldwell (1992) named this category functional diversity and was referred to as the mix of functional specialties that are present in a project group, that provides access to multiple networks, expertise, ways of thinking and facilitated procedures. In a similar logic, Pelled (1996), who was the one that first separated these two broader categories, included the dimensions of team and organizational tenure, education, and functional background to the job-related category.

As presented in Table 2.1, the diversity dimensions that researchers considered are not the same in every case but are analogous, and the use of a matrix similar to the one that Pelled (1996) created would be handy in this attempt to define and categorize diversity. Aiming to combine the findings, the matrix of Figure 2.2 was created. The dimensions that are not directly related to the workplace were characterized as low in the job-relatedness index, by the simultaneous characterization as visible or not. As a result, the race & religion dimension and the ones that are related to the family structure, sexual orientation and political views score low both in visibility and in job-relatedness, in accordance with the iceberg that Powers-Twichell & Murphy (2011) created.

Similarly, dimensions that are more visible but not directly job-related were inserted in the upper left quadrant of the matrix. These are language, age, gender, physical attributes, and nationality & origin. Even though this group of dimensions can be easily recognized, they are not expected to influence the team processes, yet they may affect the interpersonal relations. This consideration is partially in line with the findings of Watson, Johnson & Merritt (1998) that age and gender do not have any influence on team performance. At the same time, the rest of the dimensions may affect the atmosphere in the

team and the relationships among the members. The lower right quadrant shows the dimensions that are closely related to job but are not visible. These are education & knowledge, indicating the dimensions describing the educational background and the expertise of someone, the functional background, and the experience, which refer to the mix of functional specialties and the experience of different levels and functionalities respectively, and the organizational tenure, referring to the seniority and the experience within the organization of the team members. The last, upper right quadrant includes one dimension that is both job-related and visible, which is team tenure, involving the period that the members entered the team, and whether they participated in the same group development stages (Tuckman, 1965) or had to perform these stages in different periods because they entered the group separately. The high job-relatedness that characterizes these two right quadrants constitute them the most important and intervening dimensions for the team processes. Of course, the rest of the dimensions influence all procedures, for example the nationality & origin dimension may be characterized as low in their job-relatedness index, however as indicated earlier, different cultures employ different ways of perceiving conditions and reacting to them, based on the theory of dimensions of cultures (Hofstede, 1991) and this may affect the team in various ways.
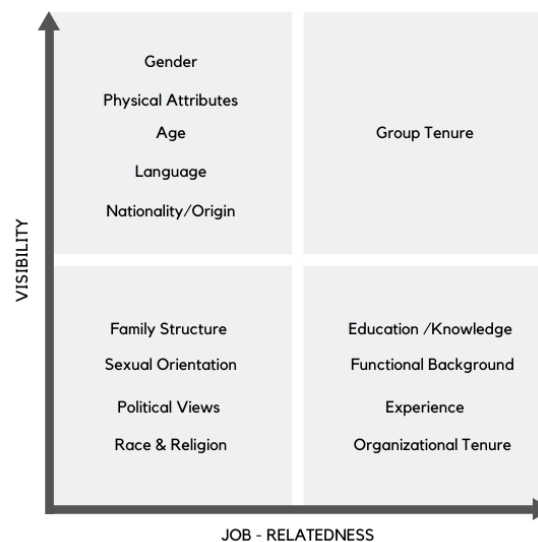
Figure 2.2 Diversity dimensions in the matrix - adjusted from Pelled (1996)

This is the reason why researchers also study these dimensions that are not job-related, which usually affect the interpersonal relations between the team members. Even though researchers did not attempt to classify diversity of a project team in total in high, medium, and low, such a classification in the context of the present thesis could be useful. First, the dimensions that belong to the lower left quadrant, namely the race & religion and the ones related to the family structure, sexual orientation and political views do not seem to affect the relationships and the tasks, as a result lead to low diversity index. Second, the dimensions that belong to the upper left quadrant could characterize the total diversity index as medium, since they may influence communication, interpersonal relations, and potentially result in relationship conflicts that are not related to the team tasks and processes (Pelled, 1996). Lastly, the dimensions included in the right quadrants and that are closely related to the job lead to a high diversity index, mainly because they lead to both task and process issues. Furthermore, the dimensions are not mutually exclusive, hence it is plausible that they can co-exist, a fact which increases the diversity index.

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Several researchers have mentioned the importance of proper recognition and management of the existing diversity (Powers-Twichell & Murphy, 2011; Armstrong et al., 2010). Improved problem solving, community relations, creativity and enhanced company image are only a few of the advantages that diversity promotes. In their study, Armstrong et al. (2010) refer to the companies that are actively engaged in promoting diversity, mentioning that these companies also utilize certain procedures such as monitoring and reporting concerning the diversity targets and its proper management. Among the disadvantages, some types of conflicts are the ones that lead to both short- and long-term problems. The way how they influence the team processes should be further investigated, since researchers identify various ways of connecting them to diversity. For instance, Pelled (1996) correlates visibility dimensions to relationship conflicts and job-related dimensions to task conflicts, Wu et al. (2019) correlated both value and knowledge diversity, which is a similar categorization to the one that Pelled (2019) made, to both task, relationship, and process conflicts.

The goal should be not only to manage this problematic aspect that diversity may create, but to address diversity as a component of an integrated management system (Armstrong et al., 2010). In their study, Powers-Twichell & Murphy (2011) highlighted the importance of attitude and described with the See-Do-Get model the way that the beliefs drive the behaviors. First, at the See stage, beliefs, attitudes and paradigms lead to the formation of perceptions about others that result in behaviors and actions. These actions can either be restrictive and biased or proactive and encouraging. At the Get stage the results differentiate. Team members may feel that there is no space for their opinions and follow the team's way of thinking, or they may feel comfortable, with their ideas and opinions being considered, leading to better collaboration and more open, honest exchange of ideas. Therefore, it is not only a matter of diverse characteristics, but also the approach that the project manager and the members themselves follow to treat this diversity. This is also highlighted in the study of Watson, Johnson, and Merritt (1998), who mentioned that the process tasks that are increased due to diversity can be managed through feedback about interpersonal behaviors. The importance of proper periodic process feedback may be the key to balance between process issues, and as well as between self- and team-orientation.

After examining what past studies have found and how they considered diversity, a broad definition for diversity for this research can be sketched. It will constitute the first part of the guidelines that will be created, since it is the base for recognizing the diversity dimensions that are present. The definition also addresses the response to the first research sub-question. Of course, it cannot be absolute, since as mentioned in Section 2.1, diversity is a very broad notion with many aspects. Consequently, diversity in working groups encompass all those characteristics that the group members bear and can differentiate them from others. To be more precise, these could be personal traits and characteristics like age, gender, physical attributes, language, nationality & origin, race & religion, family structure, sexual orientation, or political views, which are connected with the personality of an individual and determine the way he/she perceives issues and conditions, reacts and affect the interpersonal relationships that are being built. Moreover, characteristics and conditions that are closely related to the job are among the most influential diversity parameters. These are education & knowledge, functional background & experience, organizational tenure, and team tenure.

3 Survey

The design of the dimensions' matrix that defines the broad notion of diversity was based on the literature findings and can act as a solid base for the next steps. Aiming to evaluate the matrix and better define it, the second phase of this research begins with the setup of a survey that will explore how diversity is perceived in practice. The chapter describes the survey set up, followed by the validity and the data gathering procedure.

3.1 Setup of the survey

The questionnaire consists of four parts in total, the first of which refers to the personal background of the respondent, while the three following parts refer to the diversity of the project team, as experienced in a project recently completed or ongoing. In this way, the responses will reflect the current perceptions and practices, leading to updated results. Of course, the survey is anonymous with all personal information being analyzed without any reference to certain projects or companies.

The first part is about the personal background and experience of the respondent. It was important that this part be placed first as the respondents should know upfront which of their personal information is required. In this way it was ensured that they would consent and then continue to the rest of the questionnaire. This is not considered sensitive information, given that the questions are related to aspects such as age, gender, study background and experience, that constitute not only the demographics of the analysis of the questionnaires, but also a first indication about the diversity dimensions that are present in the respondents themselves.

The second part is addressing the project and the project team, serving as a transition to the aspects that are of particular interest. The first questions concern brief explanations of the project's objectives and goals, the project phase, and the team development stage & experience. The reason for including these questions in the section is that the project phase and the team development stage & experience can be used in the analysis as criteria to recognize patterns of these combinations. This is because according to Tuckman's team development model, each team goes through stages during its development. These stages are forming, storming, norming and performing (Tuckman, 1965). During the first two stages, stability is not achieved yet, while especially in the storming stage conflicts are usual and concern the resistance that some members show, emotions and the establishment of the team's roles and tasks. As a result, diversity may be experienced differently in the early stages of team development, and this is the goal for targeting this criterion.

By a similar reasoning, the project phase may impact the way diversity is experienced. Zwikael & Meredith (2019) described the peculiarities of the front-end phase, that differentiate it from the other phases, for instance execution and completion phases. The strategic nature of the front-end phase, the plethora of parameters that need to be defined and the intragroup friction are some of the challenging parts of this project phase. As a result, the front-end may be affected by diversity both in positive and in negative ways. For example, creativity and innovation may add value to the decisions, while conflicts may lead to friction. Because of this, the project phase was considered as an important second

criterion for the analysis. The rest of the questions examine the attitude towards diversity and the atmosphere in the team.

The third part aims to identify the diversity dimensions that are present in the project team and how they are perceived. Starting with the assessment of the dimensions identified in the literature, the respondents are asked to rate their presence in the team and to mention any other dimension recognized, that was not reported in literature. In order to narrow down the length and the duration of the questionnaire, 11 out of the 14 diversity dimensions were considered in the questionnaire. The dimensions of Physical Attributes, Family Structure, Sexual Orientation and the one of Political Views were considered irrelevant regarding the aspects that are studied, therefore were not included in the questions. Following that, some open questions about a general description of diversity in the team and whether it was considered when forming the team are addressed. In the next question, respondents are asked to categorize each dimension based on their visibility and job-relatedness. These two broad categories constitute a base in the classification of the dimensions as proposed in the literature (Pelled, 1996), and were used in the designed matrix, leading to four sub-categories of high and low visibility and job-relatedness. This question aims to compare the theoretical matrix with the empirical views.

The last questions of the third part address the effects that are triggered by each diversity dimension. This is an extensive question, and the responses give the opportunity to examine which dimensions are mostly related to certain effects. These effects, as described in Table 2.2, can reflect either positively or negatively on the atmosphere of the project team and the performance of the project. Further exploration of this positive or negative character is investigated in the questionnaire, by asking how they are experienced, based on two parameters. The first is the atmosphere in the project team and the second is the influence on the performance of the project. In this way, two different areas of influence are examined, namely intragroup relations and project performance. The intention is to clarify the effects caused by each dimension, whether some dimensions trigger contradictory effects or whether some dimensions do not cause any effects. The data collected by these fields may influence the way in which the diversity dimensions are presented in the matrix created through the literature review (Figure 2.2), since the effects are interconnected to the way the matrix is structured.

The last part of the questionnaire addresses some statements about the company. Initially a question about the size of the company in terms of employees is asked. The company size will act also as a criterion for the analysis, aiming to examine whether smaller companies are more restricted in affecting the team composition because of the smaller number of employees, while bigger companies can influence the team compositions and handle diversity of the employees better. Last but not least, the respondents are asked to scale some statements to investigate whether diversity is recognized, encouraged and the employees feel safe to express themselves and develop their careers. The main aim of these questions is to gather some first insights about the attitude towards and the management of diverse teams, which will be further explored through the semi-structured interviews.

3.2   Validity of the survey

Aiming to ensure the validity of the survey, certain actions took place during its setup. First, the draft was reviewed by experts, starting the feedback rounds. Three more drafts were created and tested to

check the questions and their rationality. Some questions were added, while others were deleted or edited, creating the final version. Furthermore, all questions included neutral responses (e.g. not applicable, neither positive nor negative), that would protect from the collection of false answers, in case the respondents were not familiar or informed enough with the issue that the question addresses. The flow of the questionnaire was designed in a way that secures smooth transitions, and combined with a progress bar, the opinions and views of the respondents could be collected in a comfortable way.

Because the research required the involvement of humans, the guidelines designed by the Human Research Ethics Committee had to be followed, accompanied by a formal Data Management Plan (DMP), which had to be approved by the committee. The plan assessed the risk of all the aspects of the research, for instance the participants, the subject of the questions and the data processing. In this way ethics were secured and risks were mitigated. The HREC approval was obtained on February 18th, 2022.

3.3 Data Collection

The target group of the respondents included project managers and team members that are involved in an ongoing or recently completed project. These teams could belong to construction industry, to process industry or to life sciences and technology industry. Additionally, the roles of the companies which these teams belong to, could be contractor, consultant, or client. Six companies were invited to participate in the survey, of which five responded positively and participated in the questionnaire. Two of them are contractors, one is technical consultant and two are management consultant. The collection of the responses started on February 28th, 2022, and the deadline was set for March 15th. A reminder was sent five days before the deadline, to allow a better engagement with the participants that postponed the completion of it but were willing to participate. In total approximately 350 mails were sent to project managers and team members. The response rate was significantly satisfactory, with 150 responses being collected, which results in a positive response rate of 42,8%. Based on the sampling size theory and the response rate (Walters, 2021), the collection of responses was successful since the data collected exceeded the expectations. Nonetheless this number is not absolute, since some of the respondents answered only part of the questionnaire, without proceeding to the last parts. The full questionnaire was filled in by 74 respondents, leading to a response rate of 21,1%, which is closer to the typical rate, but still very satisfactory. Furthermore, the uncompleted responses were chosen to be part of the analysis, to make the results richer, even though they do not contain data on the whole questionnaire. In this way, the maximum insights from the professional practice are gathered.

4   Analysis of the survey

The chapter presents the analysis of the results, which is achieved partly through the Qualtrics "Data & Analysis" and "Results" features and partly through statistical analysis with the SPSS program. The Qualtrics features were chosen for the preliminary analysis since they can indicate patterns and tendencies, that indicate how the SPSS analysis can be optimized. Before exporting the results, the test responses were deleted as a first data cleaning step. Next, the respective features of Qualtrics were used to produce the first graphs.

The main analysis is covered in Sections 4.1-4.4, with each section to represent a part of the questionnaire. Moreover, secondary and/or more detailed Figures and Tables are attached in Appendix B. A crucial step, the combination of the results, is tackled in Section 4.5. First, by making use of the findings related to the diversity dimensions and their visibility and job-relatedness, the initial matrix is adjusted. Second, the statistical analysis takes place, by identifying the statistically significant combinations. Finally, the findings are concluded to provide the base of the next chapter and the evaluation process.

4.1   Preliminary results – Part I

The first part, which was completed by all participants provides the personal background and experience of the respondents.

- More than two thirds of the participants are male (77,3%), with the rest (22.7%) being females (Figure B.1, Appendix B).
- The dimension of age shows a wider diversity, with the vast majority of the respondents being between 30 and 50 years old (72%), followed by participants between 50 and 60 years old, and some participants younger and older than that. The results are illustrated in Figure 4.1, with the left axis representing the percentages and the bar depicting the number of responses for each age set.
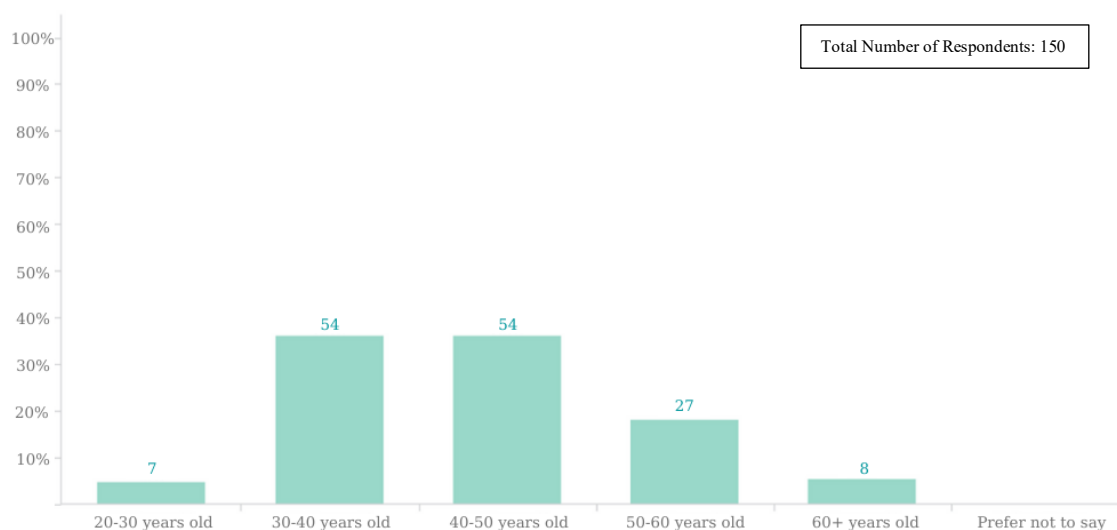

Figure 4.1 The age of the respondents

- Most participants (68%) are master's degree holders, or to a lesser extent (26%) hold a bachelor's degree (Figure B.2, Appendix B).
- As far as their study background is concerned, 80% has an engineering background, with the rest having a background in either business or science, or in two cases both in engineering and in business (Figure B.3, Appendix B).
- As for the years of work experience, a similar distribution to that of age is observed, with 19,3% having experience of less that 10 years, 35,2% working between 10 and 20 years, 29,3% working 20 to 30 years, another 13,6% working between 30 and 40 years and 2,6% of the respondents have more than 40 years of experience. It seems that most professionals have a similar career path in terms of their higher education level and the time that they entered the job market.

4.2 Preliminary results – Part II

In the second part, the questions addressed the project and the project team.
- 75,6% of the projects are related to the construction industry, with the rest of them being related to the process industry, the life science & technology industry and/or other industries.
- Next, the role of the company in the project was investigated. Almost half of the respondents (48,6%) indicated that their company has the role of the consultant, while a bit more than 41% indicated that their company has the role of the contractor (Figure B.4, Appendix B).
- Almost half of the responses (48,1%) focus on the Initiation/Front-end phase, while 36,4% focus on the Execution phase (Figure B.5, Appendix B).
- Aiming to identify the sizes of the project teams and be able to make the analysis in a meaningful way, the project team size was investigated. It was shown that more than half of the professionals (53,6%) are part of a team counting a maximum of 20 members, while another 22,7% are part of teams counting 20-40 members. Based on this, it can be concluded that the responses have a small team size as a center of attention.
- What is more, it was proven that most teams are newly formed, with 84,9% of the respondents mentioning that it is the first time working in their current team's composition. Therefore, the results show a potential to be more objective and reveal the actual diversity dimensions existing within the teams and their members. Indeed, when a team has been working together for quite a long time, the experience of the team development phases may affect their objectivity related to the diversity of the project team. The members may get used to the diversity dimensions that are present and tend to evaluate with milder criteria.
- It was considered appropriate to also include a question about the team development phase that has been reached within the team. As mentioned earlier, according to Tuckman's revised model of group development (Tuckman & Jensen, 1977), each of the phases has certain characteristics. The phases are consecutive, even though their duration may vary. However, it seems every team follows this sequence before reaching the goal of performing. That being the case, the respondents had to select all phases that they recognized during their collaboration, as illustrated in Figure 4.2. The figure displays the cumulative results with all phases that each respondent considered his/her team experienced. A bit more than half of the teams (53,1%) have reached the performing stage. Not all participants have identified the storming phase, since this phase received less answers than the norming phase that is the next identified phase across the team development procedure. It may be an indication of less intragroup conflict and polarization was

observed during the storming phase. This should be considered when analyzing the effects caused by diversity.
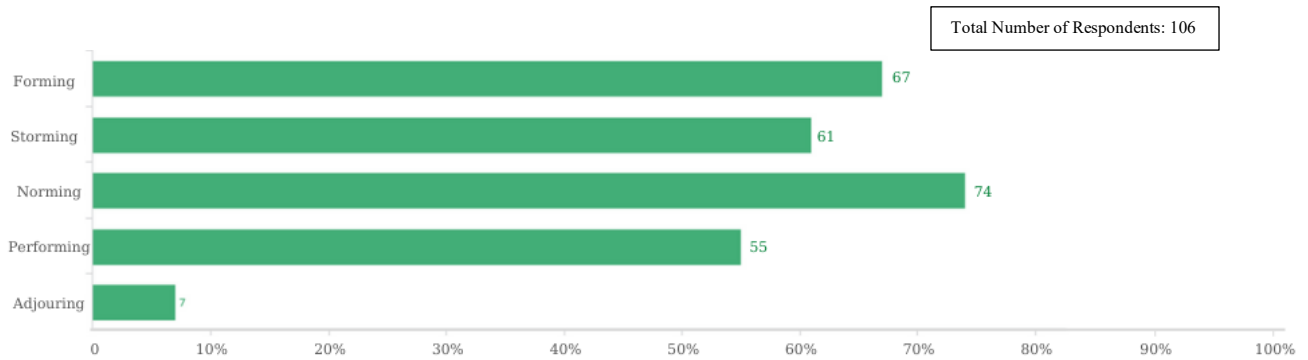
Figure 4.2 The phases of team development (cumulative)

- Lastly, a group of statements related to the project team in a Likert scale was examined. The respondents' selections are presented in Figure 4.3. More than 50% of the respondents claimed that there is a positive attitude towards diversity, while more than 70% agreed with the statement that team members respect diverse values, opinion, and views (mean=4.06). Almost none of the respondents disagreed with these statements. A key finding is that the teams usually do not have (enough) time to recognize diversity and to take the maximum advantage of it. The mean is 3.08 which indicates that most participants neither agree nor disagree with the statement. Plus, it seems that most participants agree or strongly agree with the statement that diversity has a positive effect on the performance of the project (mean=3.83). These findings show optimistic attitudes towards diversity and its dimensions.
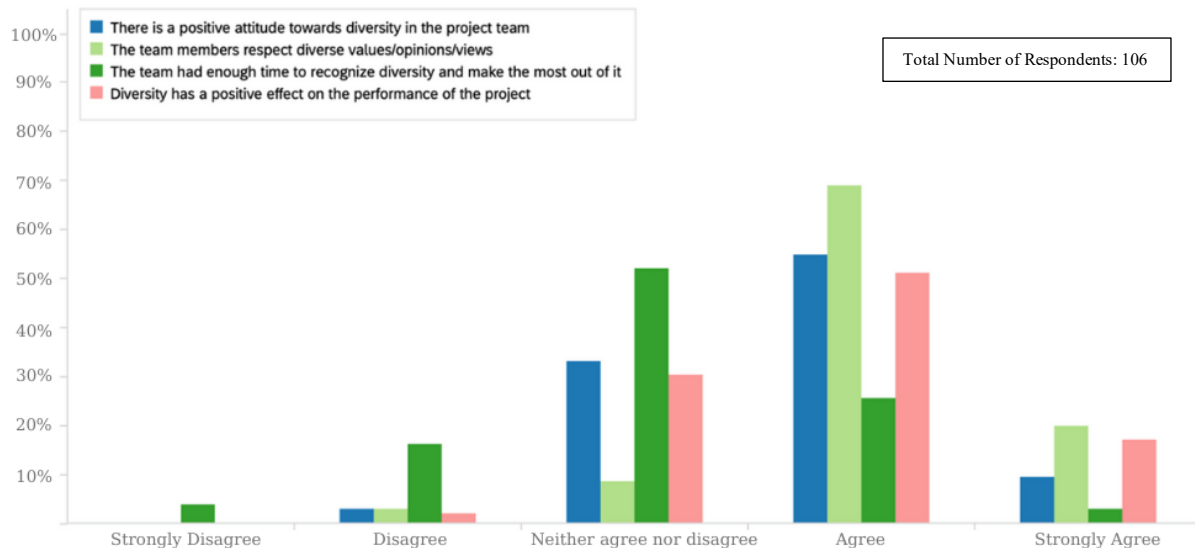
Figure 4.3 Statements concerning diversity and the project team

4.3   Preliminary results – Part III

The first question of the third part delved deeper into the recognized diversity dimensions with a Likert Scale which asks participants to rate each dimension based on the degree to which it is recognized

within the project team (Figure 4.4 & Table 4.1). Based on the mean values of the results, the dimensions of Functional Background and Experience, by having a mean value above 3 indicate that they constitute the most present and frequent dimensions recognized within the project teams.
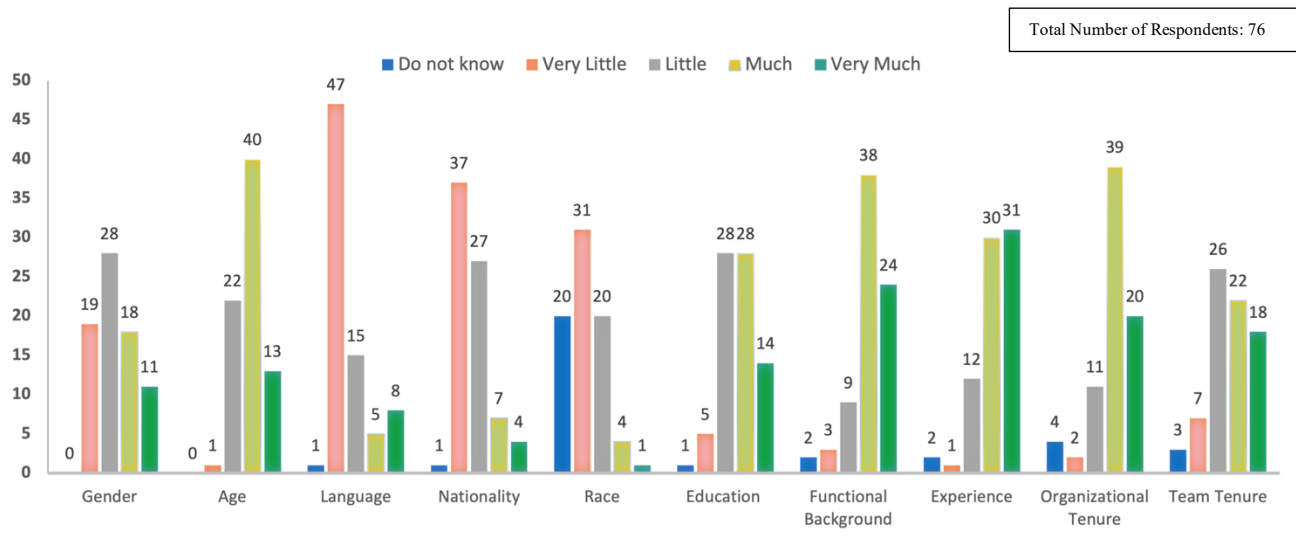

Figure 4.4 The degree to which each diversity dimension is recognized in practice - results

On the contrary, the dimensions of Language, Nationality & Origin and Race & Religion scored less than 2 in mean value, meaning that participants recognize little or very little these dimensions. When examining the Race & Religion dimension, which had a mean value of 1.14, was the least recognized category, concentrating 20 out of the 76 responses (26,3%) as "Do not know". It most probably should not even be considered as a dimension for this research and the professional practice in The Netherlands. These results are presented in detail in Appendix B (Figure B.6 and Table B.1)

Table 4.1 The degree to which each diversity dimension is recognized in practice - mean and Std deviation

Total Number of Respondents: 74

Dimension	Minimum	Maximum	Mean	Std Deviation
Gender	1	4	2,28	0,99
Age	1	4	2,86	0,70
Language	0	4	1,63	1,01
Nationality/Origin	0	4	1,68	0,86
Race/Religion	0	4	1,14	0,91
Education/Knowledge	0	4	2,64	0,90
Functional Background	0	4	3,04	0,91
Experience	0	4	3,14	0,91
Organizational Tenure	0	4	2,91	0,99
Team Tenure	0	4	2,59	1,07

Followed by this, the participants were asked to rate the diversity dimensions according to the perceived visibility and job-relatedness. For this reason, each dimension was characterized as high or low in visibility and in job-relatedness. In this way, the proposed matrix (Figure 2.2) can be adjusted, considering both the views of the diversity dimensions in literature and in practice.

- When visibility is examined (Figure 4.5), it is observed that the dimensions of Age, Gender and Experience are the most visible according to the respondents.
- On the contrary, the dimensions of Nationality & Origin, Race & Religion and Organizational Tenure collected the lowest scores in terms of visibility.

The most interesting finding is related to the dimensions of Experience, Education & Knowledge and Functional Background which also score high in the visibility index. When the diversity dimensions matrix was created, these dimensions were considered low in visibility, but highly job-related. The finding may mean that the respondents perceived visibility as a broader notion than what was initially considered in the research. For instance, an experienced professional can illustrate this knowledge and experience of his/her background within the first few minutes of a discussion. This constitutes the dimension of experience quite visible. Consequently, the initial matrix needs to be adjusted based on these answers. This new version of the matrix will be presented in the section that follows the ones of the preliminary analysis.

Total Number of Respondents: 76
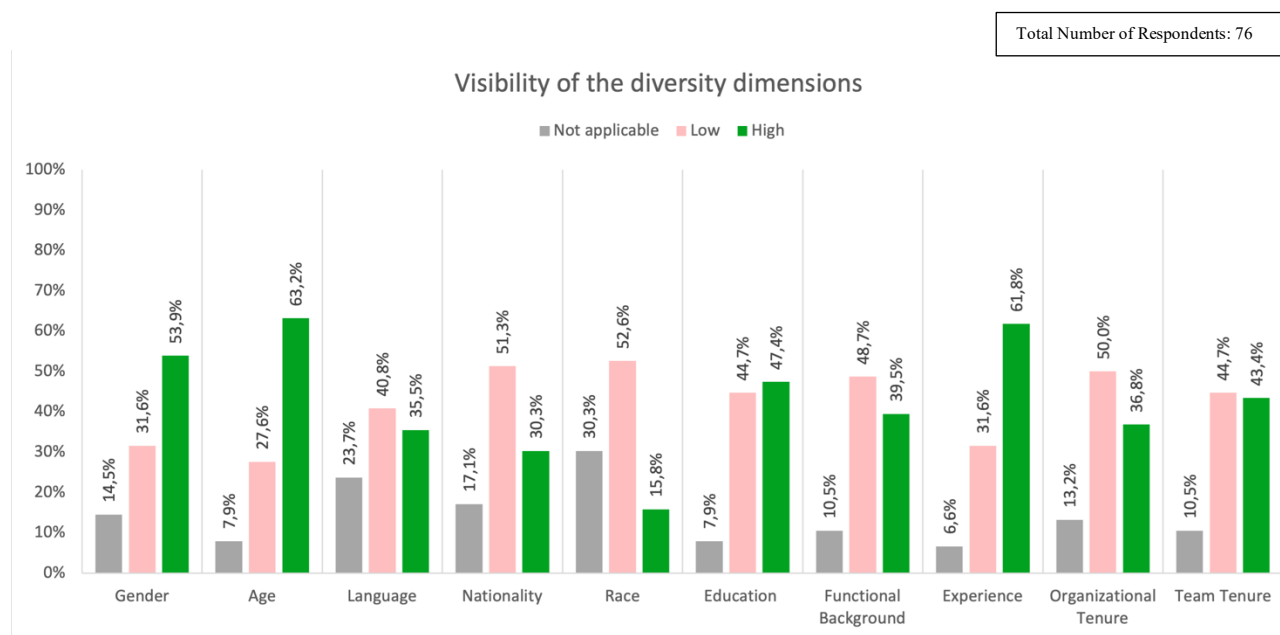
Figure 4.5 Characterization of the visibility level of each dimension

In a similar way, the dimensions were rated for their high or low job-relatedness.

- As presented in Figure 4.6, the most job-related dimensions are Experience, Education & Knowledge, and the Functional Background. The least job-related dimensions are the ones of Gender, Nationality & Origin and Race & Religion. These results do agree with what was initially considered concerning job-relatedness.
- Another interesting point is related to the dimensions that are mainly visible, for example Gender and Language, where the job-relatedness is considered by 18% of the respondents as not even applicable.

Job-relatedness of the diversity dimensions

■ Not applicable ■ Low ■ High
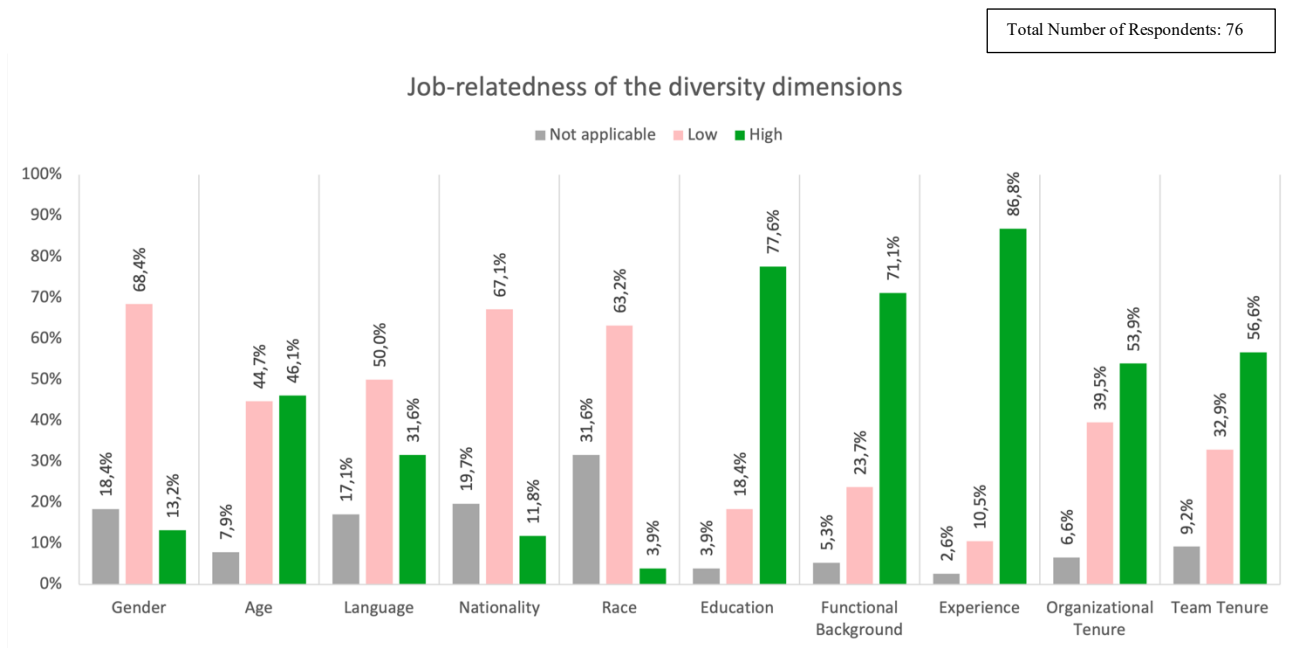
Figure 4.6 Characterization of the job-relatedness level of each dimension

This part of the questionnaire also examined which diversity dimensions trigger each effect. The key elements are presented in Figure 4.7, while the full, detailed tables are available in Appendix B.

- Experience seems to be the most important diversity dimension that affects most of the effects, while Education & Knowledge and Organizational and Team Tenure are among the most influential dimensions.
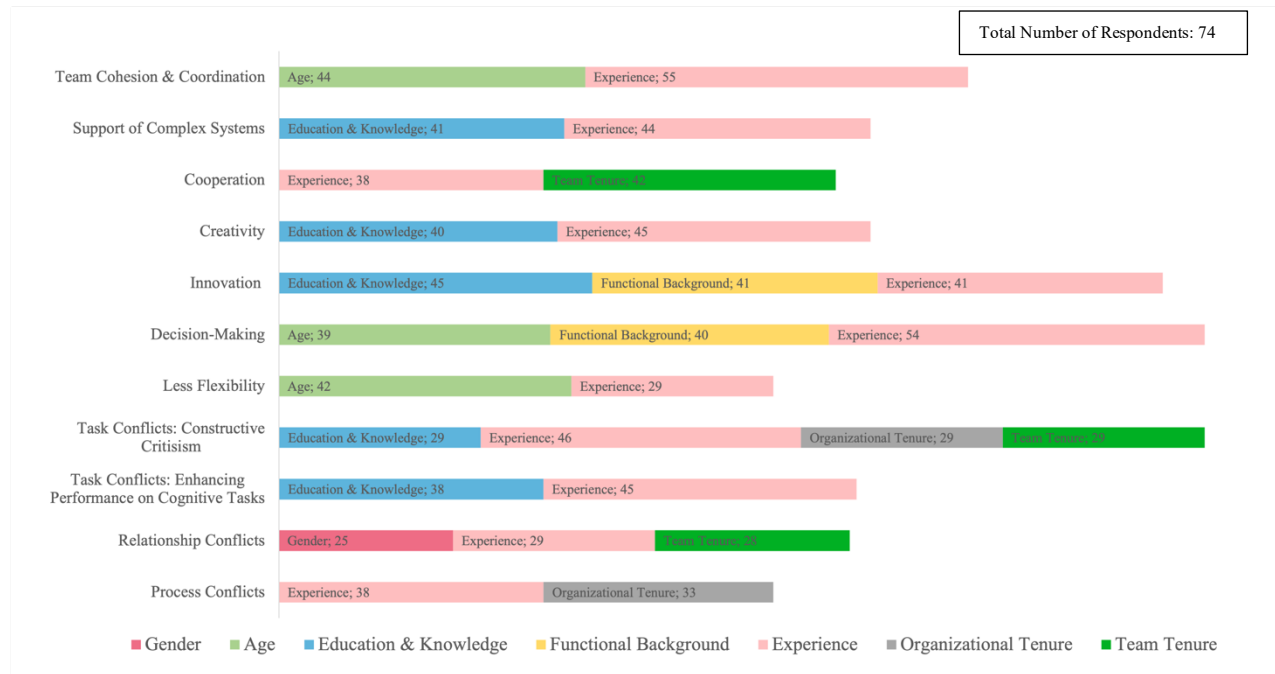
Figure 4.7 The dimensions by which each effect is mainly triggered (selection of multiple dimensions for each effect)

- According to the responses, Team Tenure is affecting not only the Cooperation of the team members, but also the Task and Process Conflicts. As a result, it can be considered as one of the most influential dimensions in terms of balancing between cooperation, conflicts, and enhancement of the team's performance.

- Some findings that are worth mentioning are the dimension of Age, which is believed to affect both Team Cohesion and Coordination and Flexibility, so it can be claimed that it also belongs to the influential dimensions.
- Gender was the third most influential dimension among the ones that trigger Relationship Conflicts. This is an issue that should be further investigated in the next phase of the research. When examining the dimensions triggering Relationship Conflicts, Team Tenure and Experience should be considered along with the dimension of Gender.

Regarding the positive or negative influence of these effects, the last part of Appendix B presents the cumulative findings (Tables B.2 and B.3). As already mentioned, each effect was examined for its positive or negative influence in terms of the atmosphere of the project team and of the performance of the project.

- Confirming what the literature indicated, when focusing on the atmosphere of the project team, Relationship and Process Conflicts have mainly negative or somewhat negative influence, while Task Conflicts sometimes have a somewhat positive (33,8%) or even positive (10,8%) influence.
- When exploring how these effects affect the performance of the project, most of these effects have a positive influence, except of the "Less flexibility" effect.
- Task Conflicts seem to have a very positive impact too, with the part of "Constructive criticism" to have collected 44,6% and 27% somewhat positive and positive responses respectively, while the "Enhancing performance on cognitive tasks" part collected 47,3% and 14,9% of somewhat positive and positive responses respectively. It can be concluded that even though Task Conflicts do exist, they positively affect both the team atmosphere and the performance of the project.
- One last observation when reflecting on project performance is that Relationship Conflicts and Process Conflicts affect in a clearly negative way performance, with 44,6% and 36,5% of negative responses respectively. This should be considered and further investigated in the next parts of this research, given that the 25,7% and 32,4% reported somewhat negative influence too, while the "No influence" choice collected a percentage of 18,9% in both types of conflicts.

It can be claimed that the findings of the questionnaire confirm most of the literature findings. However, the diversity dimensions' matrix and definition require some adjustments before designing representative guidelines of the current conditions and practices in The Netherlands. Such findings will be discussed in the evaluation process, and the final adjustments will be made in the Discussion chapter (Chapter 6).

4.4 Preliminary results – Part IV

The fourth part of the questionnaire investigated the size of the companies and their attitude towards diversity.

- As shown in Figure 4.8, half of the companies (50%) employ 1000 to 4999 professionals, while one third (31,1%) of them has 50 to 999 employees.
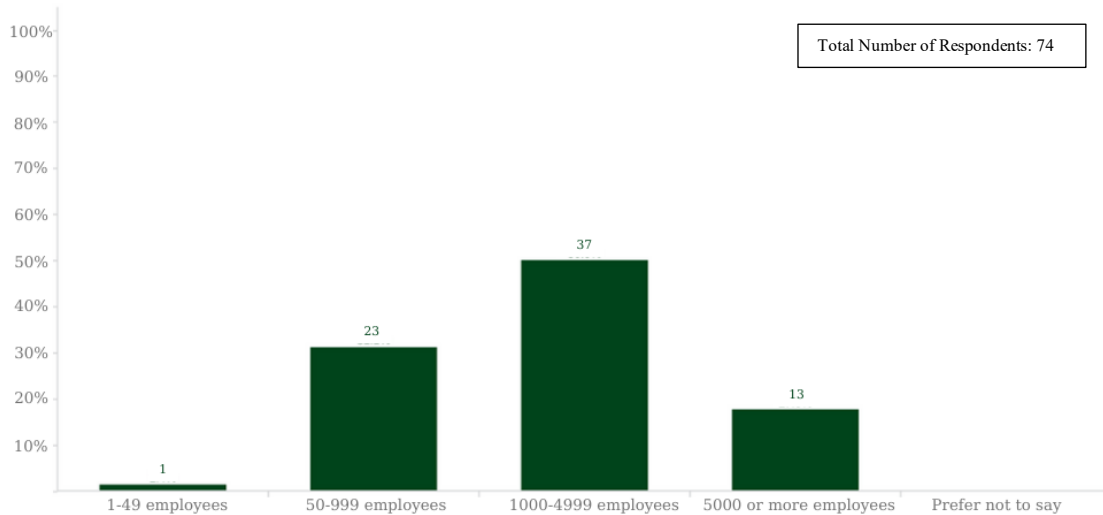
Figure 4.8 The number of company employees

- Concerning the statements that the respondents were asked to evaluate, the results seem to be encouraging (Figure 4.9), since the companies respect diversity and foster a workplace that allows all employees to be themselves. Most of the statements concentrate their responses to around 60% of the "Agree" option, while none of the respondents chose the Strongly Disagree option for the statements.
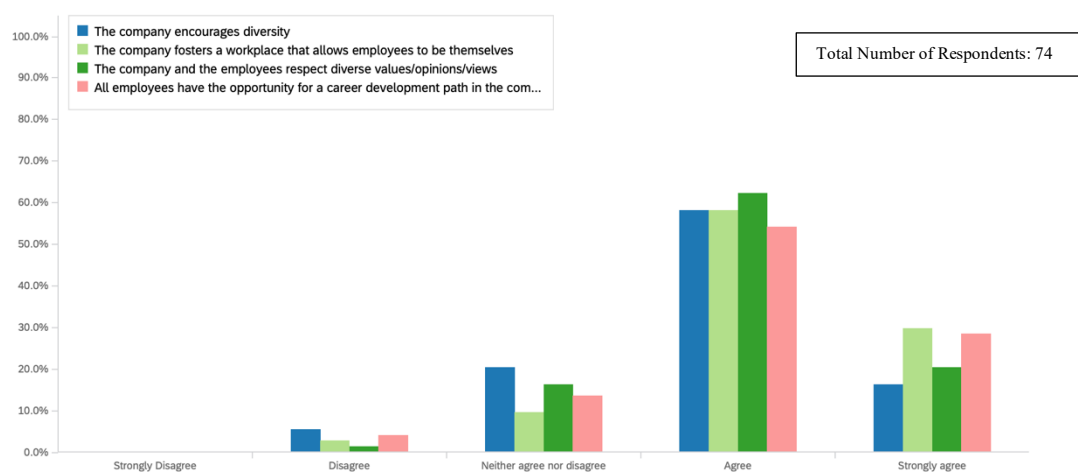
Figure 4.9 Statements about the attitude of the companies towards diversity

Looking at the bigger picture, the results of the survey can be considered encouraging, giving the opportunity for the design of promising guidelines that will better define the team diversity, its effects and the main actions that have to take place to ameliorate the atmosphere of the team and the project performance.

4.5   Result combination

Following the analysis of the individual questions and parts, a systematic approach was followed to combine the findings with the main aim being threefold. First, the adjustment of the matrix with the diversity dimensions, to reflect the current perceptions and practices in The Netherlands. Second, the

use of the findings concerning effects that will determine the most crucial dimensions and the modifications that will assist in the maximization of project performance. Third, the design of the evaluation process.

4.5.1   Adjusting the Dimensions' Matrix

In order to assess the dimensions that were included to the matrix, the responses of the respective questions were examined. The basis of the assessment was the mean value, while the general tendencies of the results were observed. For instance, the presence of the Race & Religion dimension was assessed with a mean value of 1.14 which indicates that most of the responses, 51 out of 76, indicated very little/little presence, while 20 respondents chose the answer "Do not know". It can be concluded that this dimension is almost insignificant, since even if is present, it cannot be considered crucial or influential to any aspect of the project team.

The dimensions were divided in three categories of high, medium, and low value, as illustrated in Table 4.2. The aim of this step was to get a clearer view on the results and adjust the matrix accordingly. The second step was the utilization of the assessment of the visibility and job-relatedness categories. In the third part of the questionnaire, where the diversity dimensions were examined, there was a question in which the respondents were asked to assess each dimension as high or low in terms of these two indexes. The basic finding was that the respondents indicated a different way of perceiving the two indexes.

Table 4.2 Categorization of the presence of diversity dimensions in the team based on their assessment by the respondents

Low Value	Medium Value	High Value
Language (1.63)	Gender (2.28)	Functional Background (3.04)
Nationality/Origin (1.68)	Age (2.86)	Experience (3.14)
Race & Religion (1.14)	Education/Knowledge (2.64)	Organizational Tenure (2.91)
	Team Tenure (2.59)	

This way of perception differentiates a bit from the one followed both in this study and in the study of Pelled (1996), who first made this separation as described in Section 2.6. As a result, dimensions that were initially considered high in job-relatedness and low in visibility because of their nature, for instance Experience and Team tenure, were surprisingly rated as high in visibility too. The main reasoning behind this tendency is probably that even if not directly visible, these dimensions could be perceived as visible since they are present and easily observed even in the first interactions of a recently formed team. By this is meant for instance that a highly experienced team member has respectively highly visible attitude and opinions related to his/her expertise, which can be recognized even during a short introduction of himself. As a result, it is evident that this experience will be perceived by others as a visible dimension and not as a merely job-related characteristic.

Based on a closer look at the results, the dimension of Experience should be moved to the upper right quadrant, with 61.8% of the responses indicating high visibility, while the dimension of Language should be considered as low in visibility, receiving 40.8% of the responses. Another dimension that was not perceived as visible as initially perceived is the Nationality/Origin dimension. Counting 51.3% of the responses indicating that it is a dimension low in visibility, it was moved to the lower left

quadrant. As mentioned, the Race & Religion dimension should be removed, since the vast majority does not even recognize this dimension in the workplace. Therefore, it is not part of the adjusted matrix, along with the dimensions of Family structure, Sexual orientation, Physical Attributes and Political views, which were considered irrelevant when designing the questionnaire. The old and new matrices are presented in Figures 4.10 and 4.11.
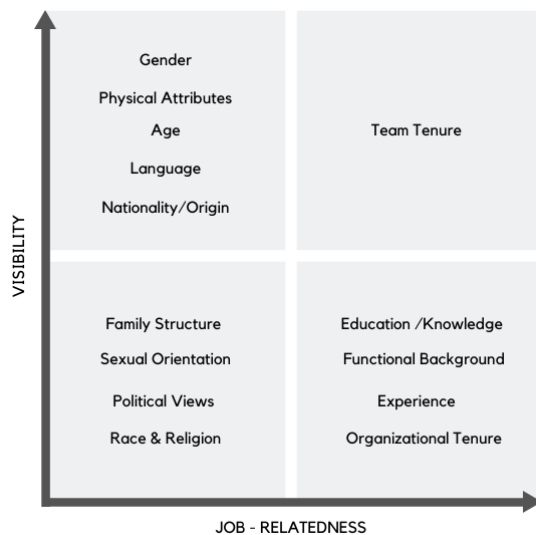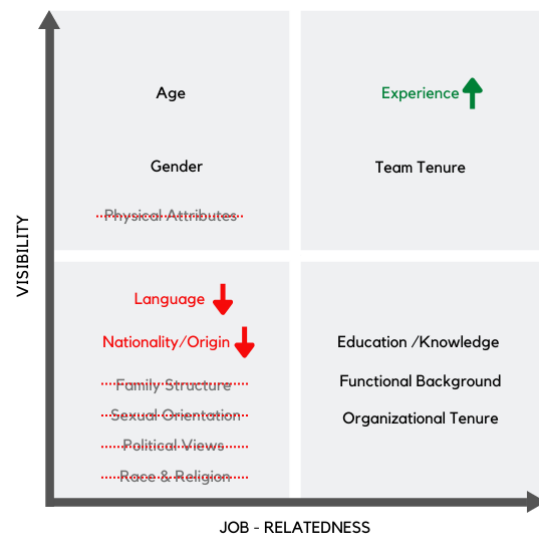

Figure 4.10 The initial form of the matrix   Figure 4.11 The adjusted matrix

4.5.2   Statistical evaluation of the dimensions and the effects of diversity

An important parameter for the design of the diversity guidelines is the evaluation of the effects that are triggered by the diversity dimensions, examined as mediating conditions that improve or deteriorate both the atmosphere of the project team and the performance of the project. That being the case, the third part of the questionnaire addressed this goal, asking to select the dimensions that mostly trigger each effect. Initially a cumulative graph was created (Figure 4.7, Section 4.3), presenting for each effect two or three diversity dimensions with which it is mostly related. As already mentioned, some dimensions that are mainly visible but not very job-related, can trigger effects to a large extent, and this is the main reason why the parameter of visibility was introduced in the matrix along with the job-relatedness. In this graph (Figure 4.7, Section 4.3), it can be observed that Age seems to be important for the Team Cohesion and Coordination, the Less Flexibility and the Decision-making effects. What is more, Gender is the third most influential dimension for the Relationship Conflicts effect, a finding that should be taken into account and be further investigated. Except of this set of questions that connected the dimensions with the effects, two more questions investigated the positive or negative implication of these effects on the atmosphere of the project team and on project performance.

The statistical analysis was achieved using the SPSS software. The Kruskal-Wallis H Test was chosen as the most suitable based on the data. The Kruskal-Wallis H test is a non-parametric statistical test that assesses the differences among three or more independently sampled groups on a single, non-normally distributed continuous variable (McKight and Najab, 2010a). It is the non-parametric equivalent of the one-way ANOVA test. The choice of performing a parametric or a non-parametric

test depends on whether the variables are normally distributed or not. Since they are not normally distributed, one of the non-parametric tests has to be performed, but in this way null hypothesis is rejected when p-value is less than 0.05. The null hypothesis assumes that any difference between the chosen characteristics in a set of data is due to chance. When p-value is less than 0.05, rejecting it, the statistically significant relationships are discovered.

The variables for which such differentiations where examined are the Age, the Role of the Company, the Team Size, and the Company Size, while the effects were examined against two different parameters, the atmosphere of the project team and the performance of the project. Furthermore, except for the effects, the correlation of the dimensions themselves to the groups of the same variables was examined using the same non-parametric test.

- In terms of diversity dimensions, it was proven that teams of different sizes present statistically significant differences in the way they assess the Team Tenure dimension, while employees in companies of different sizes assess in a different way the Functional Background and the Organizational Tenure dimensions.

As already mentioned, the effects of diversity were examined in terms of their positive or negative influence on the atmosphere of the project team and on the performance of the project. This parameter was the dependent variable, while the independent variables were one of the following: Age, Role of the Company, Team Size, and Company Size.

- In the combination of the Atmosphere of the project team (dependent variable) and the Role of the Company to the project (contractor, consultant, or client - independent variable), statistically significant differences were found for the effect of Innovation. As illustrated in Table 4.3, the p-value for this combination was 0.027.
- For the same dependent variable, when the Team size was chosen as an independent variable, it was found that different team sizes assessed the Cooperation effect in a different way.
- In terms of the Performance of the project, respondents belonging to companies of different sizes evaluated the Less flexibility effect alternatively (Table 4.3).
- All statistically significant findings of the Kruskal-Wallis H Test are presented in Table 4.3, acting as a first indication. To discover between which groups these differences are located, a series of Mann-Whitney U Tests is required. For this reason, these sets were examined again, using couples of independent groups to discover in which this statistical significance is present.

Table 4.3 The Significant Results of the Kruskal-Wallis H Test

Independent Variable	Dependent Variable	Statistically Significant Variable	p-value
Company Role	Atmosphere of the project team	Innovation	0.027
Team Size	Atmosphere of the project team	Cooperation	0.002
Company Size	Performance of the project	Less Flexibility	0.037
Team Size	Dimensions	Team Tenure	0.008
Company Size	Dimensions	Functional Background	0.008

The nature of the Mann-Whitney U Test, comparing the differences between two independent groups, required the examination of these groups two by two. The Mann-Whitney test is the non-parametric version of the parametric t-test (McKight and Najab, 2010b). It tests the differences between two groups on a single variable with no specific distribution. By examining the respective p-values the statistically significant relationships are found. The null hypothesis is rejected when the p-value is less than 0.05, as in the Kruskal-Wallis Test. In the results of the Mann-Whitney tests some extra statistically significant results were found, which were not detected during the Kruskal-Wallis tests. For instance, Decision-making and Relationship conflicts are assessed differently by employees of different Company Sizes, in terms of Performance of the project. As shown in Table 4.5, when examining two groups, one of companies having 50-999 employees and one of companies having 1000-4999, the results indicate that in larger companies, better decision-making is achieved, with a positive influence of the performance of the project. The reason why these statistically significant results were not found in the Kruskal-Wallis tests, is probably due to the examination of all the groups together, where the p-value was slightly higher than the 0.05 threshold (e.g. the p-value for the combination of the company size to relationship conflicts was 0.076), while when examining them in detail the statistical significance was detected in a clearer way.

Table 4.4 The Significant Results of the Mann-Whitney U Tests

Independent Variable	Dependent Variable	Statistically Significant Variable	Combined Groups	p-value	Description
Company Role	Atmosphere of the project team	Innovation	Contractor & Consultant	0.042	In Consulting companies, Innovation has a positive influence on the Atmosphere of the project team
Team Size	Atmosphere of the project team	Cooperation	≦20 & 41-60	0.013	In smaller teams, Cooperation has a positive influence on the Atmosphere of the project team
			21-40 & 41-60	0.011	
			41-60 & 60+	0.015	In very large teams, Cooperation has a positive influence on the Atmosphere of the project team
Company Size	Performance of the project	Less Flexibility	50-999 & 5000+	0.011	Very large companies experience Less Flexibility with a negative influence on Project Performance
Company Size	Performance of the project	Decision-making	50-999 & 1000-4999	0.033	In larger companies there is better decision-making related to the performance of the project
Company Size	Performance of the project	Relationship Conflicts	50-999 & 5000+	0.028	Larger companies experience more Relationship Conflicts with a negative impact on the performance of the project
Team Size	Dimensions	Team Tenure	≦20 & 21-40	0.001	Teams that are not too small consider Team Tenure an important dimension
Team Size	Dimensions	Organizational Tenure	≦20 & 21-40	0.008	Teams that are not too small consider Organizational Tenure an important dimension
Team Size	Dimensions	Gender	≦20 & 21-40	0.021	Teams that are too small (≦20) consider Gender an important dimension
Company Size	Dimensions	Functional Background	1000-4999 & 5000+	0.02	Larger companies consider Functional Background a more important dimension
Company Size	Dimensions	Functional Background	50-999 & 5000+	0.004	Larger companies consider Functional Background a more important dimension
Company Size	Dimensions	Organizational Tenure	50-999 & 1000-4999	0.03	Larger companies consider Organizational Tenure a more important dimension

There are two more steps that should be part of this research. First, by knowing which specific groups indicate special attitude towards certain effects, their further correlation with the dimensions that trigger those effects would be useful. For instance, the Mann-Whitney test proved that in larger companies (1000-4999 employees) there is Decision-making with a positive influence on the performance of the project. The diversity dimensions that are mostly related to the Decision-making effect were found to be Experience, Functional background, and Age (Table 4.2). Consequently, it should be investigated whether it is not solely the size of the company that makes the difference, but also the presence and distribution of the diversity dimensions, with which this effect is related. In this way, the approach that should be followed in achieving the goals of both the team and the project will be clearer. Second, the most important findings and indications should be concluded.

4.6   Conclusions

After analyzing the findings of the questionnaire using descriptive statistics and the Kruskal-Wallis and Mann-Whitney tests, the key points should be summarized to respond to the second research sub-question, to assist in the design of the evaluation process and ultimately the design of the guidelines.

The second research sub-question aimed to explore the types of diversity in practice. The matrix of the diversity dimensions that was created through the literature review was adjusted to describe the findings from practice, hence is the one that better describes the types of diversity in practice. The diversity dimensions that are recognized fall under two different categories, namely visibility and job-relatedness. The diversity dimensions that are mainly visible are: Age, Gender, Language and Nationality/Origin. The dimensions that are mainly job-related are: Education/Knowledge, Functional Background, Organizational Tenure, Team Tenure and Experience.

The analysis set the base for the assessment of the effects triggered, the ways they are perceived in practice and their positive or negative influence. As revealed in the statistical analysis, some dimensions are perceived differently by different groups. These dimensions might trigger certain effects thar are or are not desired. Additionally, certain groups may experience differently some effects, which is another issue to be considered. One group of effects that is related to the interaction and processes of the team, like Team Cohesion & Coordination, Cooperation and Flexibility, is connected to the dimensions of Age, Team Tenure and Organizational Tenure. Another group of effects is related to conflicts, correlating them with Gender, and Team and Organizational Tenure. A condition worth mentioning is the positive attitude towards Task Conflicts, being considered even desirable for the enhancement of project performance. Moreover, the other two types of conflicts, which tend to be triggered by Team and Organizational Tenure, cannot be considered helpful neither for the atmosphere of the team nor for project performance. At this point, especially the connection between Relationship Conflicts and the Gender dimension should be handled carefully, given that almost 80% of the respondents were male, and this can have affected the objectivity of the results.

5 Evaluation of the Survey findings

The fifth chapter of the thesis aims to evaluate the findings that emerged by the survey. The main tool for achieving this goal is a series of meetings with experts, whose experience allowed for detailed discussion of the most crucial findings and the investigation of the reasons behind them. As a result, these meetings did not have the usual interview setup, asking for the personal opinion of the interviewees concerning the topics. The experts were asked to respond as representatives of the field, and to describe in a more explanatory way where these findings are based upon. The goal of this procedure is to manage to respond to the third and to the fourth research sub-questions, which reflects on the connection between diversity and its effects, influencing the atmosphere of the team and the project performance.

5.1 Evaluation Process Setup

The findings of the Kruskal-Wallis and Mann-Whitney tests should be further analyzed to better explore their origins and influences. Focus should be given on dimensions and effects that are present but affect certain aspects of the project, and which show differentiations based on specific parameters, like the size of the company. For this reason, the base of the evaluation process was chosen to be each dimension, while the effects and the observed parameters were coupled with them. This base consists of five dimensions, namely Organizational Tenure, Functional Background, Age, Gender, and Team Tenure. Only five out of the nine dimensions of the adjusted matrix are targeted since the dimensions of Language and Nationality/Origin seem to be insignificant regarding the team processes and cooperation. What is more, investigating the dimensions of Experience and Education/Knowledge that trigger all or almost all effects would not be effective. Figure 5.1 visualizes the setup process in a flowchart.

As illustrated, the diversity dimensions constitute the base, the effects that are triggered by each dimension are added, accompanied by the extra findings of the statistical analysis. The dimensions chosen are the ones which with their presence or absence trigger certain effects. Next, the parameters that emerged from the statistical analysis, for instance the company or team sizes were matched to these effects and dimensions.

The first dimension explored, Organizational Tenure, is one of the most present dimensions within the project teams (mean 2.91 out of 5). It was mostly recognized in larger companies (1000-4999 employees) and medium sized teams (21-40 members). What is more, it presents a stronger positive connection with task conflicts and a stronger negative connection with process conflicts. In this way the atmosphere of the project team and the performance of the project are affected positively or negatively respectively. The goal of the evaluation would be the exploration of why these findings emerged both in general terms and in these specific company and team sizes.

The second diversity dimension under-examination is Functional Background. The findings showed that there is a linear relationship between the company size and the presence of diversity in Functional Background. Plus, the effects of Decision-making and Innovation seem to benefit from this dimension.

This is a statement that should be better analyzed and is the main topic of discussion concerning this dimension.
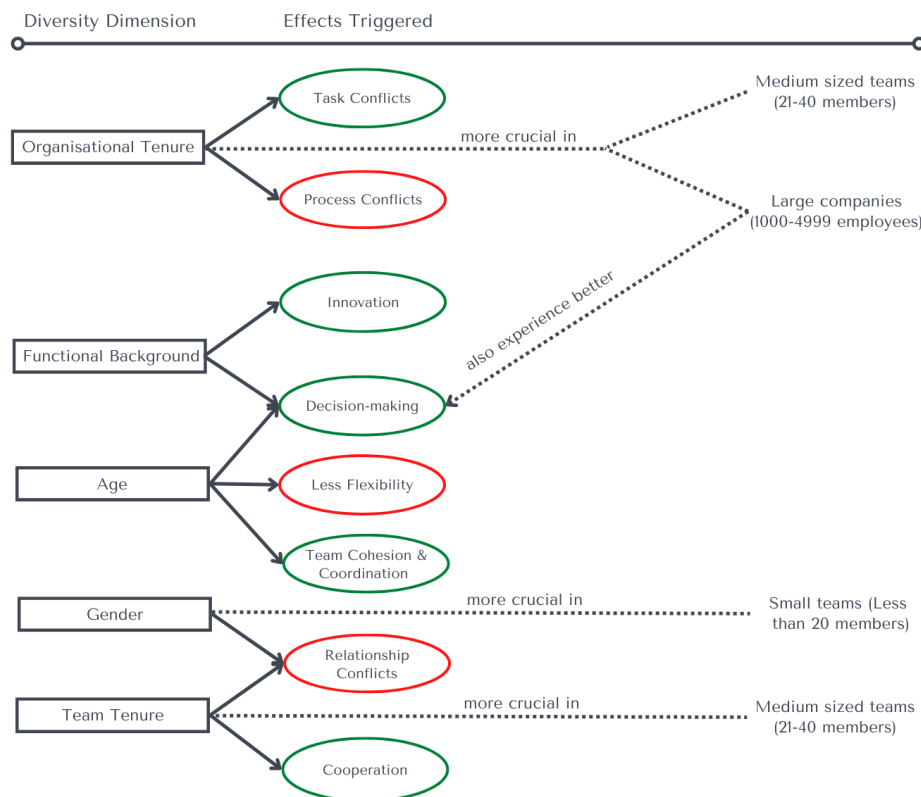

Figure 5.1 The setup of the evaluation visualized

Next, the evaluation process will continue with two dimensions that were not among the most recognized or job-related. However, they can affect in various ways the procedures and the atmosphere of the team and the performance of the project. These are Age and Gender. Concerning the Age dimension, when present, it has a positive connection with the effects of Team Cohesion & Coordination and of Decision-making, although it presents a negative connection with Flexibility. Hence, the statement explored the positive impact on the Decision-making effect, related to the traits and characteristics that members of various ages bear, but also the reasoning behind the less flexibility that is observed. By this the goal is to recognize the conditions under which the desired or the undesired effects are caused and propose the most adequate guidelines.

Concerning the Gender dimension there were two main observations, with the first being the fact that it is more present is small teams (<20 members). The second observation and discussion topic is that in larger companies (1000-4999 employees) it seems to have a stronger influence on relationship conflicts, leading to a negative effect to both the atmosphere of the project team and the performance of the project. Hence, the reasoning behind this should be explored, and especially the statistically significant finding related to the larger companies. The statement provided to the experts queries whether diversity by one may create more conflicts or diversity by more could minimize conflicts. Indeed, the goal of this statement is to explore whether the low levels of gender diversity that characterize construction industry is one of the main reasons why relationship conflicts are triggered.

Last but not least is the dimension of Team Tenure. The dimension was reported as more present in medium sized teams, while it was found to affect positively the Cooperation and to trigger more Relationship Conflicts. These observations led to the need for exploration of the way in which diversity in Team Tenure is handled when forming a team and how the negative effects could be minimized.

5.2   Context

For the evaluation of the findings to be successful, two series of meetings were considered essential. Two of the companies that had already participated in the survey were chosen, aiming to avoid deviating from the culture of the companies that sketched these findings. Two experts from each company were interviewed as representatives, one representing the project team and one representing the human resources department, which determines and organizes the project teams and their composition. Therefore, the two representatives act as internal and external team executives. A set of slides was used to facilitate the introduction of the research and the dimensions and effects studied. In this way the evaluation sessions had the shape of semi-structured interviews, which left room for open conversation and follow-up questions. This structure assists in serving the same purpose and thematic approach in all evaluation meetings, allowing at the same time for the content to be more flexible and intelligible (Sandy & Dumay, 2011).

The duration of these expert meetings was around forty minutes, with the first couple of minutes including the introduction and the goals of the research and the questionnaire. The findings were organized based on the dimensions of diversity and the effects that they trigger, as well as the observations that emerged from the statistical analysis. In consequence, for each diversity dimension, a brief definition was provided, accompanied by the most triggered effects and observations, either in the form of a statement or in the form of a specific question. The experts were asked to comment on these findings and add their input and perspective.

The expert meetings took place online, during the last week of May and the first week of June. An automatic transcript was created during each interview, which was then edited to formulate the formal transcript. These transcripts are available upon request, while their summaries are presented in Appendix C.

5.3   Evaluation Process - Results

The evaluation meetings were held successfully, by discussing and discovering the reasoning behind the findings that emerged. Along with the explanations, more aspects of the dimensions emerged, giving the opportunity for a more integrated approach, that will be discussed in Chapter 6. In this section, the results of the process are presented. They are separated in subsections with each subsection to be based on one out of the five dimensions discussed. The names of each subsection refer to that dimension, as well as the main effects that are connected to this dimension and which sketch the discussion topics. Finally, the experts are named by their role and the numbers 1 or 2, with an abbreviation being used in the text as follows: HR manager 1 (HR1), Project Manager 1 (PM1), Project Manager 2 (PM2), HR manager 2 (HR2).

5.3.1 Organizational Tenure & Task and Process Conflicts

The statement that was discussed during the meetings was referred to the finding that this diversity dimension is more present in larger companies (1000-5000 employees) and in medium sized teams (21-40 members). In addition, it was connected to the existence of more task and process conflicts, with the former being related to positive influence and the latter being related to negative influence on both the atmosphere of the project team and the performance of the project. The two project managers confirmed the findings, with PM2 mentioning that it is probably because of the interaction between the younger and the older generations. On the one hand, younger employees are used to working digitally, positively affecting the elder employees in adopting the digital tools that emerge, while on the other hand, the older generations employ the experience gained to properly guide the younger employees. What is more, HR2 confirmed that when there is more organizational tenure and diversity in seniority, communication becomes more explicit. Even though this is helpful, sometimes it increases tension and the balance between discussing and giving orders is interrupted.

Furthermore, PM1 highlighted that those mechanisms between dimensions and effects that were identified are not commonly known within the teams and the working practice. As a result, even though they are recognized when presented to them, they are not handled properly because of this lack of combination between the cause and the effect. For instance, in this case the cause is the diversity in Organizational Tenure, and the effects are some of the Task and the Process Conflicts observed. Even though the degree to which this causation exists in the project teams vary, dealing with minimizing the effects is possible under the condition that the causation is found.

Another important aspect is the onboarding process that is followed when a new employee joins the organization, as well as the team bonding procedures. HR1 explained why the onboarding process is challenging, potentially even more challenging in larger companies than in the smaller ones. Even though they have a formal guide with the procedure and the steps that should be followed by both the new employee and the manager, this is often not easily applicable. These difficulties arise not only in the organizational tenure itself, but also in the lack of time. As a result, the new employee may need to undertake tasks before the onboarding process reaches a satisfactory degree, which can create tension and friction. HR2 highlighted the importance of attitude during the onboarding. The lack of time constitutes attitude a very important parameter since collaboration during the onboarding can lead to conflicts if there is not adequate attitude by both sides. The new member should be eager both to learn and to ask, while the older members should be willing to help and facilitate the process.

5.3.2 Functional Background & Innovation and Decision-making

The presence of the Functional Background dimension was found to have a linear relationship with the size of the company, while Decision-making and Innovation are benefited by this presence. In general, all experts confirmed this statement, although they had to propose some warnings. Firstly, PM1 highlighted that diversity in Functional Backgrounds is not necessarily needed within the company, but within the project. Therefore, this can be achieved by other mechanisms as well, for instance by partnering up with other companies. The second point of attention should be the line that separates the quality from the process of Decision-making. As PM1 mentioned, the quality of decision-making is actually benefited, while the process may be challenging. This is logical due to the

combination of different worlds, which can increase innovation, but which may be complex when considering a successful process. This consideration was confirmed by PM2 as well, by mentioning the difficulties that may arise when the various ideas that originate from different functional backgrounds need to be merged. Remarkable is that both project managers reached this conclusion about the benefited quality of Decision-making which is separated by the process of Decision-making, consequently it can be claimed that this observation is double confirmed.

HR2 confirmed the findings, illustrating similar points of attention. According to him, functional background diversity benefits the quality of decision-making by the different perspectives that are provided, ensuring that all aspects are considered. However, the process of decision-making is more difficult since reaching a decision that satisfies all sides is not easy. At the same time, it is fertile ground for innovation, because innovation in practice flourish mainly in the interfaces between the disciplines.

5.3.3 Age & Decision-making and Flexibility

As indicated from the analysis, Age positively influences Team Cohesion & Coordination as well as Decision-making, but restricts Flexibility. These findings were a fertile ground for conversation in the meetings. HR1 highlighted the importance of exchange of knowledge and expertise between the team members, but also the difficulties that may rise when it comes to adopting new working methods or technologies. As described, her organization always tries to take the people along with the new wave, by organizing educational sessions on new technological evolutions or new perspectives. Even if the sessions are sometimes only partially successful, it is essential to find ways of combining both sides, the higher affinity of younger generations with new technologies and methods, with the experience and perspicacity of the older generations. On top of that, the fact that the process of exchanging knowledge and expertise is ameliorated year by year is encouraging.

PM1 made a distinction between the quality and the process of decision-making. While diversity of Functional Backgrounds affects mainly the quality of Decision-making, when focusing on Age diversity the process of Decision-making is the affected aspect. And this is probably happening because of the willingness to explain and the lack of experience, which open up new possibilities. This consideration comes in line with the opinion of PM2, who claimed that even if it is true that older people might not be so flexible to change their ways or methods of working, they are somehow forced to do so to some extent. And, thus, the best of both worlds is brought together, leading to better decision-making. But this facilitation of different opinions and ways of working that diverse ages bring to the project team can also lead to less Flexibility. As HR2 described, different angles can boost problem solving, under the condition that all members want and feel free to express their opinion. The difficulty lies in the more dominant character that older members may have, that make younger members feel restricted in expressing their opinions, but also the older members themselves in proposing new ideas.

Another point for which PM1 raised a concern was the aspect of Flexibility. According to her, when considering Flexibility, it is more of what age brings as a quality, for instance a better sight on the risks and some other elements. A personal example of her was that the goal is not only the project to be

delivered well, but also the company to continue existing or the payments to be arranged on time. It is very important that flexibility should be balanced with experience and risks. Hence, the reduced flexibility effect should be considered more like a point of attention rather than a serious drawback.

5.3.4 Gender & Relationship Conflicts

The diversity dimension of gender was found to be more present in small teams (less that 20 members) and to be mainly related to relationship conflicts in the questionnaire. What is more, relationship conflicts were more present in large companies (1000-5000 employees). Along with these findings, the statement that was discussed in the evaluation was whether diversity by one may create more conflicts and whether diversity by more could minimize conflicts. What is meant by this is that a more balanced situation in terms of gender diversity could assist in creating a more balanced exchange of opinions and points of view. The statement implicates that gender diversity should be increased in order to minimize conflicts.

During the first meeting, HR1 stated that the company really believes in and encourages gender diversity. It is also considered that women bring other competences to the team, which improve decision-making. Moreover, the performance of the team, and eventually of the project becomes better, because problems and issues are spoken out from all different angles. According to her, there is not enough evidence within the organization that connects gender diversity and relationship conflicts to date, so the finding cannot be verified. On the contrary, the observations of the HR department in the company indicate the need for the increase of gender diversity, even though the field is not only male-dominated, but there are still men who believe that women cannot perform at the same level as men.

Similarly, PM1 provided an explanation looking at the bigger picture of the industry. As stated, the observation that gender diversity is more present in smaller teams may be related to the fact that there is a lack of females in the sector, not only based on the absolute numbers, but also on given that most of the females of the sector are engineers and not in senior positions. And this is why they are mainly part of smaller project teams and projects. Another input of this discussion was that conflicts that are observed may originate from the different perspectives and the tendency of female leaders to have a project-oriented goal setting rather than organizational- and personal-oriented goal setting that men usually have. But exactly because of this, the different perspectives should be spoken out, benefiting the project. Based on this, in a more balanced condition (increased gender diversity), the same exchange of opinions would feel more like a discussion rather than a conflict. HR2 expressed a similar opinion that conflicts may be result of different communication, goals and competition between the genders. Additionally, they may be related to the lack of female leaders in hierarchy, as well as to the positive discrimination that exists towards this. Aiming to correct gender equality in the company and in hierarchy leads to gender inequity due to the positive discrimination. On account of that relationship conflicts may occur when following that positive discrimination policy.

Furthermore, PM2 also confirmed the hypothesis that diversity by more would assist in minimizing conflicts. As explained, even though when describing him the findings, they and their potential connection are recognized, it was not realized until now. As for most of these diversity dimensions, the causes of the effects are not easily observed in everyday life. When being aware of this connection,

the manager agreed that the increase in gender diversity would potentially minimize conflicts since the attitude and reactions of males would be affected, and this imbalance would be tackled. The new competences added when increasing gender diversity that are much needed, constitute an extra reason why gender diversity would benefit not only the projects but the whole industry.

5.3.5 Team Tenure & Cooperation and Relationship Conflicts

The dimension of Team Tenure was reported as more present in medium sized teams (21-40 members), triggering the effect of collaboration in a positive way and relationship conflicts in a negative way. The discussion also addressed the way in which the dimension is handled when forming the team, as well as what measures are taken to minimize the negative effects.

HR1 agreed with the beneficial effects of team tenure but in her view, it is not necessary that the existence of tenure would increase the conflicts. It is possible that conflicts are mostly related to unsuccessful team bonding and not per se to the joining of new members. Indeed, there was a similar statement which the respondents were asked to answer in the questionnaire. In the last question of the second part of the questionnaire, when participants were asked to agree or disagree with the statement "There was enough time to recognize diversity in the project team and make the most out of it", most of them agreed that there is not enough time. Therefore, this is another indication of poor team bonding. At the same time, the longevity of the team is highly dependent on the nature of each project and its needs. It is always helpful to retain the composition of a team, but not always possible. When problems or conflicts arise, interventions start, with an external coach if needed, to tackle the challenging aspects.

This lack of possibility to control the exchange of the members within the teams was mentioned by PM2 as well, since it is a practical-based decision. By this it meant that the phase and progress of the project are the main criteria when deciding the size, composition, and longevity of a team. As a result, having the same composition of the team in the long term or in more than one project is usually a coincidence, even though there is a tendency to collaborate with the same partners and continue the same joint ventures. As a result, there is a fine line between keeping productive team compositions and strategically selecting new team members. HR2 is in favor of changing team compositions frequently, in order to retain aspects like the knowledge exchange, creativity and flexibility in high levels. Changing the compositions should be done gradually and by keeping balance on the tasks and responsibilities that each member has. Gradual transition to the new composition is essential to avoid the negative consequences that hurried changes may create.

Also, PM1, who did recognize the effects as well as the increased presence in medium sized teams, focused on this team size. According to her, even in extensive teams (counting 100-150 members) there is a core of 20 to 40 people that are continuously present in the project, while a lot of people join or leave the team in the meanwhile. This is also beneficial for speeding up things and different task or different knowledge. So, this team size may actually be beneficial for the triggered effects.

5.4   Conclusions

Before answering the main research question, the third and the fourth sub-questions should be answered. The analysis of the questionnaire along with the evaluation process tackle the two last sub-questions. The third research question explores how diversity and its effects are experienced in practice. Although several effects are present, some of them proved to be triggered by either the most present dimensions or by dimensions of special significance. These effects are the Task and the Process conflicts triggered by the Organizational Tenure dimension, the Innovation and the Decision-making effects, triggered by the Functional Background dimension, the Less Flexibility effect along with the Decision-making and the Team Cohesion & Coordination triggered by the Age dimension, the Relationship conflicts triggered by both the Gender and the Team Tenure dimensions, and finally the Cooperation effect, related to the Team Tenure dimension too.

The third sub-question is connected to the fourth sub-question, which explores how the atmosphere of the project team, and the performance of the project are affected. The first indications of how these two parameters are affected were provided by the survey responses, while the mechanism was then discussed in the evaluation process. First, according to the observations both the atmosphere of the project team and the performance of the project are affected either positively or negatively. Second, an encouraging element is that most effects create a positive influence. The only effects with a negative influence on both the atmosphere of the project team and the performance of the project are the Relationship and the Process Conflicts, along with the Less Flexibility one.

The evaluation proved to be essential for the better interpretation and understanding of the results. New perspectives and insights emerged, leading to the creation of more complete picture. The guidelines for managing the existing diversity are presented in the next chapter.

6 Discussion

After completing the literature review, the survey and the evaluation process, the combined findings can be summed up to provide a better understanding and to draw the desired guidelines. Firstly, the diversity dimensions' matrix that was created through the literature review, provides the first indication of the dimensions that are crucial in the workplace and answers the first research sub-question. Secondly, the questionnaire that was based on the literature findings and was answered by professionals, assisted in the exploration of how diversity and its effects are experienced in practice. In this way, it was possible to adjust the dimensions' matrix and respond to the second research sub-question. The steps following this part provided even more insights, which assisted in the better understanding of the view on diversity in practice. Third, the statistical analysis of the survey findings, along with the evaluation process allowed for a better visualization of the way in which the diversity dimensions interact with the effects and what this may implicate for the atmosphere of the project team and the performance of the project. This led to the response of the third and the fourth research sub-questions, and eventually to the design of the guidelines. The present chapter illustrates the guidelines and refers to the limitations of this study.

6.1 Guidelines for assessing diversity and its effects

The proper recognition of the diversity dimensions and of the mechanisms that associated them with the various effects is essential for each project team. These effects have either positive or negative influence on the atmosphere of the project team and the performance of the project, hence their proper handling is of crucial importance. To date, as mentioned by the experts that participated in the evaluation process, this mechanism is not known within the project teams. According to both the project managers and the HR managers, even though most of the effects are common, their connection to the diversity dimensions and the positive or negative outcomes that follow is not clear.

Step 1: Presence of diversity in the project team
During the composition of a project team, the existing diversity should be assessed. The adjusted matrix of Figure 6.1 is a useful tool for recognizing all dimensions, which can be visible or job-related. The matrix comprises of nine dimensions, the presence of which was recognized in the project teams. What is more, the degree to which each dimension is present varies, and this should be another parameter of the assessment.
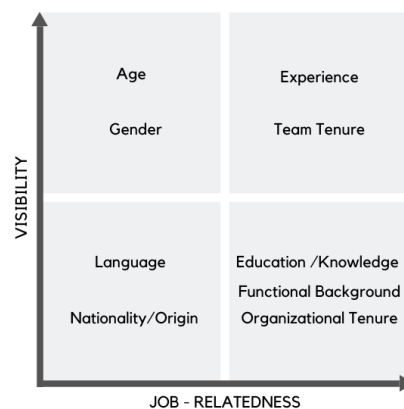

Figure 6.1 The adjusted diversity dimensions' matrix

Step 2: The onboarding process

The procedure that is taking place when a new employee joins the organization is frequently challenging, especially when it has to be combined with the tasks that need to be undertaken. This can create tension and friction, leading to the sharpening of the organizational tenure. Positive attitude and willingness to ask and explain are essential characteristics that should be considered by both sides during the process.

Step 3: Team bonding

The limited time that the team members have available to recognize the diversity of the team, as well as the temporary nature of the teams in the construction industry are some of the reasons behind poor team bonding. In addition, the link between Team Tenure and Relationship Conflicts that was revealed may be related to poor team bonding. Team members should have enough time to recognize diversity and build a positive atmosphere in the team.

Step 4: Recognition of the effects that might be triggered

The list of the triggered effects is coupled with the diversity dimensions. Each dimension triggers multiple effects to a different extent. Figure 6.2 depicts the dimensions that are mainly responsible for each effect. These are the five dimensions examined during the evaluation process, accompanied by the dimension of Experience, that practically triggers all effects, and the dimension of Education/Knowledge that triggers positively four effects. The remaining two dimensions of the total of nine that are part of the adjusted matrix and the research, Language and Nationality/Origin, do not
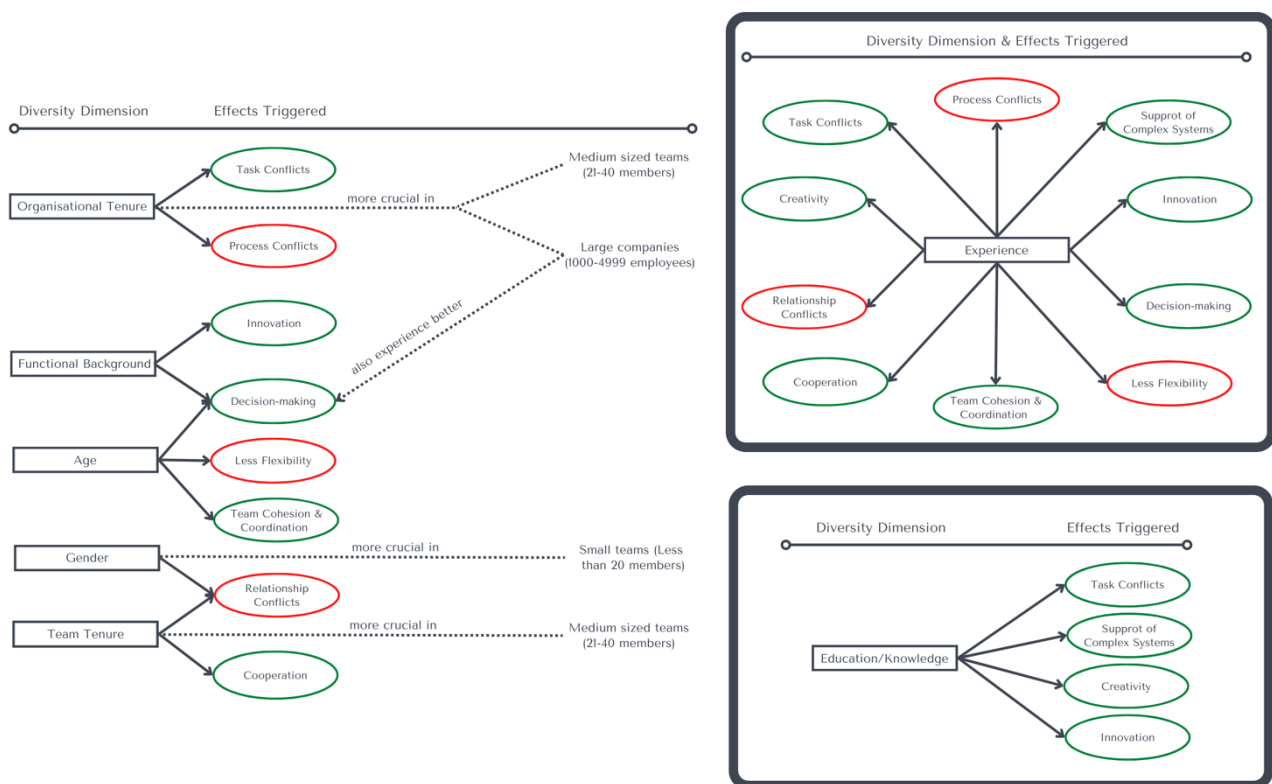

Figure 6.2 The diversity dimensions that mostly trigger each effect

significantly affect any effect. As a result, the presence of two dimensions that mainly trigger the same effect, might lead to the stronger presence of the effect, and consequently stronger influence. This may be desirable when considering the effects that positively affect the team processes and the project performance, however it can be disastrous when considering the effects that have a clearly negative influence.

Step 5: The influence of the effects on the atmosphere of the project team and the performance of the project

This step completes the main assessment of diversity and its effects. As already mentioned in literature (Section 2.3) and in practice (Section 4.3), the influence of each effect can be either positive or negative. This influence was examined towards two parameters, the atmosphere of the project team and the performance of the project. The effects that have a negative influence in both atmosphere and the performance are the Relationship Conflicts, the Process Conflicts, and the effect of Less Flexibility. The rest of the effects were found to have a positive influence on both the atmosphere and the project performance. Although Task Conflicts constitute one of the three conflict types, their constructive character allows for a clearly positive influence on the performance of the project, and a slightly positive influence on the atmosphere of the project team. Nevertheless, they should be handled carefully since if evolved, they can be transformed into the other types of conflicts (Section 2.4). After the recognition of the effects and their influence, the goal should be the maximization of the positive outcomes and the minimization of the negative ones. The flowchart of Figure 6.3 can act as a tool
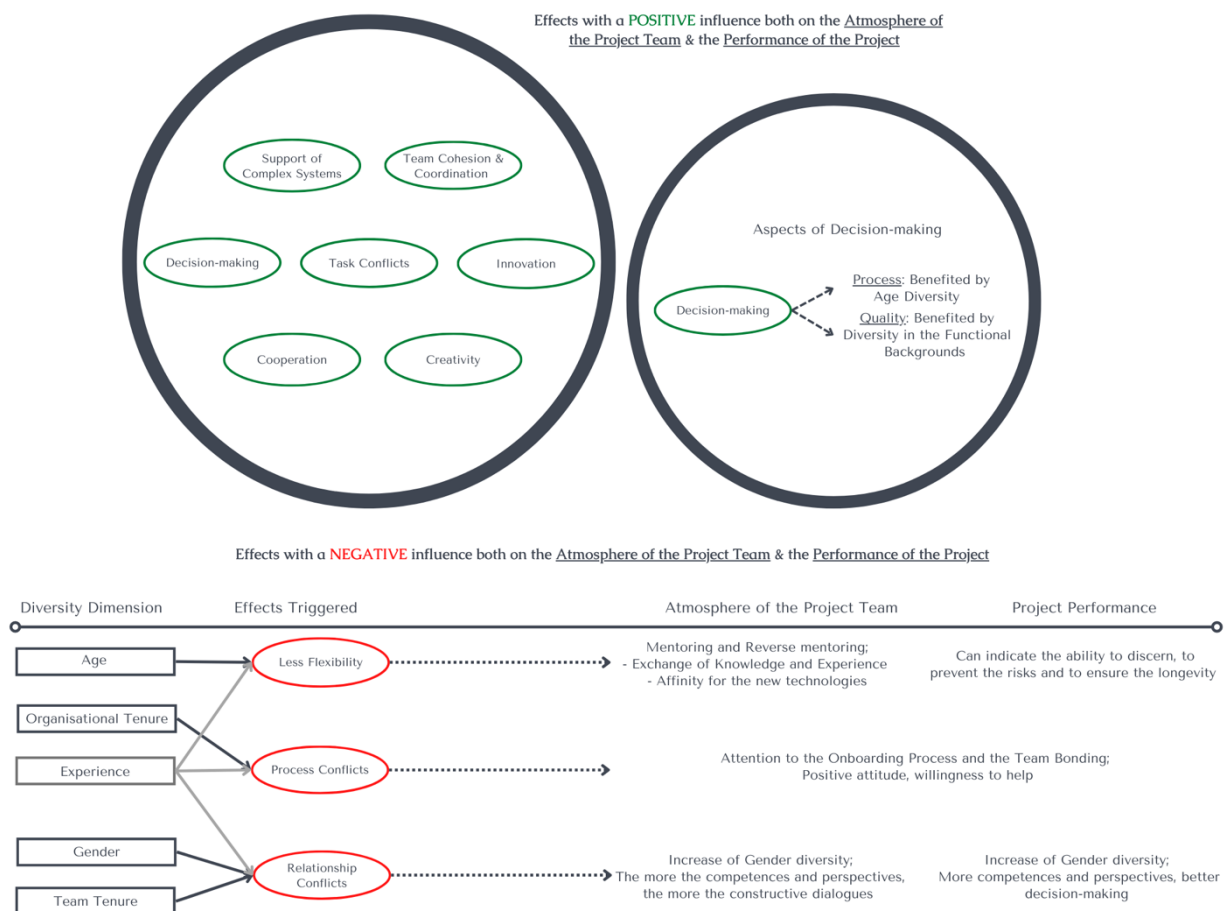

Figure 6.3 Tool: Recognition of the influence of the effects and suggested actions

when recognizing this influence. In this flowchart attention is drawn to the effects that have a negative influence, presenting the dimensions that mainly trigger them, as well as suggested actions that can minimize this negative influence.

Points of attention

Except for the general recognition of diversity and its effects and influence, there are some points of attention that should be borne in mind. These points were mainly outlined during the evaluation process and reflect the observations of the current practices.

- <u>Better Decision-making</u>: The existence of the Functional Background dimension boosts the quality of decision-making when present, but can impede the process of decision-making, due to the different consideration of the procedures that should be followed. In other words, the combination of different expertise and worlds may be supportive when more innovative ideas and better Decision-making are desired, but the implementation can be difficult. On the contrary, when there is Age diversity, the process of Decision-making is enhanced. This creates a soft interface in which the composition of a team can be based, to derive the maximum.
- <u>Reduced flexibility</u>: This is another effect, mostly triggered by Age, that can be considered as bilateral, since the evaluation process revealed some aspects that are worth mentioning. The first aspect is related to new technologies and methods in which older generations may resist to adopt. This is tackled by organizing educational sessions to promote this exchange of knowledge and experience within the organizations. At the same time, experience constitutes the older generations valuable mentors for the younger generations. Consequently, it is a matter of mentoring and reverse mentoring, which evolves over the years. The second aspect of reduced flexibility is based on its perception. Sometimes it should be considered as the ability to discern, to prevent the risks and to ensure the longevity of the team and the organization.
- <u>Gender diversity and its link to Relationship Conflicts</u>: Being one of the topics extensively discussed in the meetings, it can be concluded that the current, low level of gender diversity may lead to Relationship Conflicts. The mitigation of this negative effect can be achieved not by decreasing gender diversity, but by increasing it. The more competences and perspectives that this will entail, will make the disagreements to be considered as constructive dialogues and not as relationship conflicts.

6.2   Limitations

The present section targets to describe the limitations of the research. The first limitation is the fact that the area of research is underestimated. Given that the present research consists of an extensive literature review, the literature found was limited and far less than the research volume of other topics. One more limitation is the generalization of the results. The research focused on the construction industry of The Netherlands and the companies that participated may belong to the front runner companies that to some extent are aware of the impact that diversity may have. What is more, the proposed guidelines are not implemented. A potential implementation would allow for their adjustment, adaptation, or alteration, aiming to create a proper guide or even a framework.

When examining the methods used, even though the questionnaire was properly designed and analyzed, it presents some limitation both on the strategic selection of the groups of respondents and

on the analysis that was followed. There is a potential sample selection bias, since the companies that participated were among the companies that expressed their interest on the research and were not approached based on certain criteria. Regarding the strategic selection of the groups of respondents, the open invitation to the team managers and members could have been controlled, to enable the stratification procedure. This may have an influence on the results, since a more targeted data collection (e.g. all team members and managers of ten teams) could reveal patterns.

Concerning the content of the research, the initial plan of classifying team diversity to high, medium, and low was not achieved. As proven, the notion of diversity is not easily countable, therefore there is not a safe measure of quantifying the observations. Another issue is the extent to which the participants were objective. Each and every person is influenced by personal experiences and biases, which affect the objectivity of assessing and responding. This may have an influence on the reliability of the results.

6.3   Scientific Contribution

The chapter addressed the findings and discussed the main guidelines that have been created through the research. In the literature review fourteen diversity dimensions were identified, of which ten were part of the questionnaire. The four dimensions that were removed, namely Physical Attributes, Family Structure, Sexual Orientation and Political views were considered insignificant as workplace diversity dimensions of the construction industry. After the analysis of the questionnaire one more dimension, Race & Religion, was removed since it was not even recognized by the respondents. Consequently, the workplace diversity of the industry was defined, comprised of the dimensions of Age, Gender, Language, Nationality/Origin, Experience, Team Tenure, Education/Knowledge, Functional Background and Organizational Tenure. The setup of the evaluation process, focused on the dimensions that are more challenging and create an impact that is manageable. This is the main reason why some dimensions were excluded both from the evaluation process and from the guidelines, for instance the Experience dimension, which found to trigger all effects.

After drawing the guidelines, a response to the main research question is possible. These guidelines constitute a contribution in the exploration of the notion of diversity, which started a few decades ago (Ancona and Caldwell, 1992). Although, there are still a lot of aspects that need to be further explored, and which evolve over time, the guidelines constitute a first attempt to organize and visualize the existing diversity and its effects, allowing for the proper management of the project team. This can potentially create a positive impact on the project teams that will be aware of the findings, or on future researchers that will study the impact of diversity.

7   Conclusions & Recommendations

The concept of diversity is promising, and future research would assist in its further exploration and proper management. Based on the evaluation process, the positive attitude that prevails among organizations and professionals towards diversity indicates that project teams in the future will be even more diverse, and that this need for further exploration will be increased.

7.1   Conclusions & Research goals

This research explored the concept of diversity in the workplace and the way in which projects are affected. Aiming to narrow down the notion of diversity, the most related diversity dimensions were collected, and a matrix of all diversity dimensions was created. It was the starting point of the research, which was flourished by the effects that are triggered and the influence that they cause. The design of the questionnaire and the evaluation of the findings through the expert meetings revealed the current perceptions and practices. Initially, a preliminary analysis of the questionnaire took place, indicating the basic observations and implications. In Figure 4.7 the dimensions by which each effect is triggered were collected, constituting the base for the statistical analysis. The statistical analysis was focused on the dimensions that do trigger effects, but not all of them, since investigating dimensions that trigger almost all effects would not be effective. The excluded dimensions fall under two categories; one refers to the dimensions that are present but do not have almost any impact on the team processes (i.e. Language and Nationality/Origin), and one to the dimensions that have an impact on all aspects (i.e. Experience and Education/Knowledge).

This was an essential approach, since the goal was to discover how diversity is handled nowadays in the Netherlands. Indeed, when comparing the findings to the ones that Ancona & Caldwell (1992) reached, there are important differences that illustrate the different attitude and balance related to diversity that has been achieved throughout the past few years. It becomes clear that certain diversity dimensions are desired and are believed to create better conditions for increased project performance. The large number of competences, perspectives, affinity with the new technologies, and experience that are exist in a diverse team, do not exist in a homogenous team. Although these characteristics are desired, managing a diverse team is still challenging. New tools have to be used, while the existing ones have to be properly implemented. For example, as mentioned by the experts during the evaluation process, the onboarding process that assists in the adequate adaptation of a new employee to the organization is not always fully applied, due to time limitations. Similarly, team bonding proves to be poor in some cases, causing tension and friction.

To sum up, diversity is a broad notion which has multiple interfaces with the project aspects. If properly managed, it can positively affect project performance, and ameliorate the atmosphere of the project team. Several aspects are currently challenging, or have not reached the desired degree yet (e.g. low levels of gender diversity), however the attitude towards diversity is getting better over the years and has a promising evolution.

At this point, it is essential to recap the responses to the research sub-questions and the main research question.

Sub-question 1: What constitutes diversity in projects according to the literature?

Diversity in project teams refers to all those characteristics that the team members bear and can differentiate them from others. Two broad categories are recognized. The first refers to the personal traits and characteristics like Age, Gender, Physical attributes, Language, Nationality & Origin, Race & Religion, Family Structure, Sexual Orientation, or Political Views, which are connected with the personality of an individual, determine the way he/she perceives issues and conditions, and affect his/her interpersonal relationships. The second category refers to characteristics and conditions that are closely related to the job; Education & Knowledge, Functional Background, Experience, Organizational Tenure, and Team Tenure.

Sub-question 2: What are the types of diversity in projects in practice?

The exploration of the dimensions of diversity in practice indicated that the recognized dimensions are more focused to the job and the interpersonal relationships. The dimensions that are recognized fall under two categories, based on their visibility and their job-relatedness. The diversity dimensions that are mainly visible are the Age, the Gender, the Language and the Nationality/Origin dimensions. The dimensions that are mainly job-related are the Education/Knowledge, the Functional Background, the Organizational Tenure, the Team Tenure and the Experience dimensions.

Sub-question 3: How is diversity and its effects experienced in practice?

Although several effects are present, some of them proved to be triggered by either the most present dimensions (e.g. Organizational Tenure) or by dimensions of special significance (e.g. the dimension of Age that triggers multiple effects). These effects are the Task and the Process Conflicts triggered by the Organizational Tenure dimension, the Innovation and the Decision-making effects, triggered by the Functional Background dimension, the Less Flexibility effect along with the Decision-making and the Team Cohesion & Coordination triggered by the Age dimension, the Relationship Conflicts triggered by both the Gender and the Team Tenure dimensions, and finally the Cooperation effect, related to the Team Tenure dimension too.

Sub-question 4: How are the atmosphere of the project team and the performance of the project affected?

The first indications of how these two parameters are affected were provided by the survey responses, while the mechanism was then discussed in the evaluation process. Firstly, both the atmosphere of the team and the performance of the project are affected either positively or negatively. For instance, none of the effects has the ability to create positive influence on the atmosphere of the project team with simultaneous negative influence on the performance of the project. Another encouraging element is that most of the effects create a positive influence. The only effects with a negative influence are the Relationship and the Process Conflicts, along with the Less Flexibility one, while the rest of them (i.e. Team Cohesion & Coordination, Support of Complex Systems, Cooperation, Creativity, Innovation, Decision-making and Task Conflicts) has a positive or a very positive influence on both the atmosphere of the project team and on project performance.

Main Research Question: How are projects affected by diversity in the project teams?

Aiming to answer the main research question, the approach followed can provide some powerful indicators on how projects are affected by diversity in the project teams. First of all, the analysis proved that the concept of diversity has evolved over time, and its effects are becoming more promising and positive than in the past. Nowadays, certain diversity dimensions are desired, since there is enough evidence that they assist in the maximization of project performance. Such are the dimensions of Gender and the Age. As Powers-Twichell & Murphy (2011) mention, it is sometimes a matter of attitude towards certain dimensions and aspects. In this case, Gender may be one of the dimensions that trigger Relationship Conflicts, with a negative influence on the atmosphere of the project team and the performance of the project. However, what was found in this research was that in reality Gender diversity should be increased in order to minimize the conflicts. This would then bring new competences in the project team, positively affecting project performance, avoiding the conflicts, and creating constructive dialogues.

Most of the effects recorded do have a positive influence on the atmosphere of the team and the performance of the project, by achieving for instance better team cohesion and coordination, cooperation, decision-making and creativity. All of them indicate that diversity provides fertile ground for better project performance, especially if its negative aspects are properly managed. As described in Section 6.1 regarding restricted flexibility, even if it is one of the effects that was considered having negative influence, it can act as a point of attention and not as a negative aspect. The two effects that proved to have a clearly negative influence are Relationship and Process Conflicts. By properly handing the diversity dimensions that trigger them, Team Tenure and Organizational Tenure respectively, the presence of these effects can be minimized.

7.2   Recommendations

Undoubtedly, the concept of diversity should be further explored since it becomes more promising over the years. Because of the nature and duration of the thesis project some aspects could not be examined in depth. Hence, some of these aspects are addressed in this section. Two subsections are created, one suggesting recommendations for practice and one suggesting recommendations for future research.

Recommendations for future research
- o   The procedure could be repeated, but this time with multiple case studies and by making use of the proposed guidelines to assess the diversity of the project teams in these case studies. In this way, the existing diversity and its effects will be identified, cross-referencing the results, and building more concrete guidelines. Plus, the case studies will provide richer insights, which would assist in better defining the effects.
- o   The process could also be repeated, but this time by approaching the effects in a different way. As described in Section 2.3, the effects chosen are a mixture of the literature proposals, that led to interesting findings. Considering more perspectives could create added value. For instance, what the experts mentioned was the two different aspects that should be considered for the Decision-making effect. The process of Decision-making should be differentiated from

its quality, since some dimensions lead to improved quality of the Decision-making, while some others to better Decision-making process. In a similar way, the effect of Flexibility should be handled carefully. Sometimes it may impede performance, but it may also implicate the ability to discern and to prevent the risks.

o Another interesting topic would be the classification of the diversity levels of a project team to high, medium and low. Indeed, this was one of the goals of the current research as well, but the data collected did not allow for it. After attempting in this study to categorize the diversity dimensions based on their visibility and job-relatedness, by the collection of some extra data further categorization might be possible. Nevertheless, it is still a very challenging procedure, given how broad concept of diversity is and all the dimensions that it may include.

o Lastly, the guidelines can be implemented in one or multiple project teams, aiming to develop a framework for assessing diversity. Hence the framework would be tested adequately, giving the opportunity to be widely used.

Recommendations for practice

o Based on the analysis of the literature and the questionnaire, the proposed guidelines can be applied in practice to better recognize the existing diversity. Team leaders and HR managers will then be able to adjust the processes and managerial techniques to minimize the negative effects. Since the composition of the project teams is mainly driven by the needs of each project and the availability of human resources, being aware of what each team composition might entail is of high importance.

o Among the five diversity dimensions that were extensively discussed, the ones of Organizational Tenure, Gender and Team Tenure are those which can already be considered when managing the diversity of the team. First, organizational tenure is linked to the onboarding process of a new employee to the organization. The evaluation process indicated that the onboarding process is not always fully completed when the new employee has to undertake his/her tasks. This increases the gap of this diversity dimension leading to negative effects both for the project team and for the project. Similarly, team tenure was proven to be related to poor team bonding, so focus should be given on this aspect of the team management.

o Working towards gender diversity is still one of the goals of the construction industry. Even though some of the results of the survey indicated it as one of the causes of relationship conflicts, the evaluation process led to the conclusion that the solution that would minimize these conflicts will be the increase of gender diversity. Therefore, it is crucial to work towards this direction.

8   Reflection

After spending the last months of my degree working on this thesis project, a personal reflection for this journey is essential. Having a more technical background in my diploma studies, the master's courses gave me the opportunity to delve deeper in the managerial aspects of the projects, which provided me with a new window into the managerial world. The topic of the thesis was among my academic interests, since I strongly believe that managing diverse teams is one of the aspects that should be explored along with the evolution of the project management field.

The beginning of the thesis preparation started with a broad topic that was narrowed down gradually. This was an essential step, since the duration of the master thesis is finite. Except of the topic itself and the content of the thesis, the well-structured meetings and organization in collaboration with the university committee made the process smoother. The timely planning of the progress meetings and the green light and defense meetings led to the attainment of the scheduled duration. Those organizational aspects made me feel safer and optimistic that the progress was as planned.

Focusing on the more practical aspects, given that I was not familiar with some statistical analysis methods, this part of the analysis created some challenges. Initially, I intended to create some more complex statistical combinations but the way the questions were set did not allow it. Hence, a better exploration of the ways of statistical analysis in advance would have been useful. Although the problems faced were managed in the best possible way, they could have been avoided. For example, the questionnaire did not provide a classified range for the project team size, but rather asked the respondents to insert the number of the team members. In order to use the team size as a variable and perform the statistical analysis, the data collected had to be recoded into a new variable which created the desired ranges. Similarly, some questions that were set to have multiple responses could not be analyzed with the Kruskal-Wallis test, limiting the available variables. Although they were analyzed using other methods, for instance the multiple response tool, they could have been tackled more effectively.

Furthermore, one of the most exiting parts was the evaluation process, which gave me the opportunity to discuss the findings with experts of the field. At this point I recognized that even if diversity and its effects are present in every project team, the way in which they are connected is usually not realized. The experts mentioned this issue and showed a genuine interest on learning more about the findings. In hindsight, I understood that I could have arranged slightly longer duration for these meetings, in order to have the chance to discuss more details.

Looking at the bigger picture, I had the chance to explore new perspectives and ways of thinking, while the most important skill that I developed was the better time and work management. I really wanted to improve these skills, and the thesis project gave me the perfect opportunity.

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Appendix A: The survey

The first Appendix displays the questionnaire in its original form, as developed in Qualtrics.

Diversity Questionnaire

Dear participant,
Welcome to this survey about diversity in the workplace and its view from practice. Your help is very much appreciated.

This research is part of a graduation thesis named "Exploring diversity in project groups and how project performance is affected", for the MSc Construction Management and Engineering of Delft University of Technology by Anastasia Dimitra Kyriakou. Chair of the graduation committee is Prof. Dr. Hans Bakker, the first supervisor is Dr. ir. Marian Bosch-Rekveldt.

The survey consists of 4 parts, with the first part asking about your background and the next three parts being related to the diversity of your project team of an ongoing or a recently completed project. The purpose of this questionnaire is to better define the concept of diversity, based on professional experience.

Your participation in this research study is voluntary. If you decide to participate in this research survey, you may withdraw at any time.
All results will be analysed anonymously and future publications about this research will never refer to any project, company or person involved.

For any questions about the survey you can contact Anastasia Dimitra Kyriakou via
a.d.kyriakou@student.tudelft.nl

Thank you very much for your effort and your kind cooperation.

Anastasia Dimitra Kyriakou - MSc student

Part 1: Personal background and experience

1. **What is your gender?**

    ○ Male

    ○ Female

    ○ Non-binary / third gender

    ○ Prefer not to say

2. **What is your age?**

    ○ 20-30 years old

    ○ 30-40 years old

    ○ 40-50 years old

    ○ 50-60 years old

    ○ 60+ years old

    ○ Prefer not to say

3. **What is your highest level of education?**

    ○ High School

    ○ Bachelor's Degree

    ○ Master's Degree

    ○ Doctorate degree

    ○ Prefer not to say

4. **What is your study background?**

    ○ Engineering

    ○ Business

    ○ Science

    ○ Other: _____

    ○ Prefer not to say

5. **How many years of working experience do you have?**

    _____

Part 2: The project and the project team

1.   This survey aims to explore diversity in project teams for an ongoing project or a project recently completed. Please give a brief explanation of your project (objective, scope, expected duration).

_____

2.   In which sector is the project performed in?

○ Construction Industry

○ Process Industry

○ Life science and technology industry

○ Other: _____

3.   What is the role of the company in the project?

○ Contractor

○ Consultant

○ Client

○ Other: _____

4.   To which project phase/phases will your answers be focused?

○ Initiation/Front-end phase

○ Execution phase

○ Closing phase

○ Other, please indicate: _____

5.   How many members were/are part of your project team?

_____

6.   Has the current composition of the team worked together on a previous project before starting working on the current one?

○ Yes

○ No

○ Do not know/Prefer not to say

7.   According to Tuckman (1965), there are five team development stages that constitute the team development model, as illustrated in the figure below.

Phases of Team Development

Forming, Storming, Norming, Performing, and Adjourning — based on group development model by Bruce Tuckman
All phases are necessary and inevitable for a team to grow, tackle problems, find solutions, plan work, and deliver results.
Copyright © 2008-2021 Scott M. Graffius. All rights reserved. For permission requests, contact scott@scottgraffius.com.

Which of the team development phases did you experience in your project?

○ Forming

○ Storming

○ Norming

○ Performing

○ Adjourning

○ ⊗None of the above

8.   Please select one response for each statement

	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
There is a positive attitude towards diversity in the project team	○	○	○	○	○
The team members respect diverse values/opinions/views	○	○	○	○	○
The team had enough time to recognize diversity and make the most out of it	○	○	○	○	○
Diversity has a positive effect on the performance of the project	○	○	○	○	○

Part 3: Diversity dimensions
Please answer for one project team and for an ongoing project or a project recently completed.

1. **Based on the literature review, several diversity dimensions are recognized. Please indicate how you would assess the following diversity dimensions in your project team.**

	Very Little	Little	Much	Very Much	Do not know
Gender	○	○	○	○	○
Age	○	○	○	○	○
Language	○	○	○	○	○
Nationality/Origin	○	○	○	○	○
Race/Religion	○	○	○	○	○
Education/Knowledge (there is a variety of education and knowledge background in the team)	○	○	○	○	○
Functional Backgrounds (team consisting of a variety of functional backgrounds/expertise)	○	○	○	○	○
Experience (variety in the years of experience among the team members)	○	○	○	○	○
Organizational Tenure (Seniority, type of employment, different periods of joining the organization)	○	○	○	○	○
Team Tenure (different periods in which the members joined the team)	○	○	○	○	○

2. **Are there more diversity dimensions that you can recognize in your team, which were not included in the table of question 1? If yes, which dimensions?**

_____

3. **How would you characterise the total diversity of the team?**

	Minimum									Maximum	
	0	1	2	3	4	5	6	7	8	9	10

Diversity | ━━━━━━━━▮━━━━━━━━ |

4.   According to literature, two broad categories can be considered, that characterize the diversity dimensions and their effects on team processes. These are visibility and job-relatedness. Visible are the dimensions that are not necessarily related to the job, but which have an impact on someone's personality and attitude. Job-related are the dimensions that have a direct impact to the job and the team's processes.

Please characterize the diversity dimensions based on their visibility and job-relatedness level according to your experience in your project team.

	Visibility			Job relatedness		
	High	Low	Not applicable	High	Low	Not applicable
Gender	○	○	○	○	○	○
Age	○	○	○	○	○	○
Language	○	○	○	○	○	○
Nationality/Origin	○	○	○	○	○	○
Race/Religion	○	○	○	○	○	○
Education/Knowledge	○	○	○	○	○	○
Functional Background	○	○	○	○	○	○
Experience	○	○	○	○	○	○
Organizational Tenure	○	○	○	○	○	○
Team Tenure	○	○	○	○	○	○

5.   Several positive and negative effects have been related to diversity. It is believed that each dimension triggers different effects. In the following table please indicate based on your experience on your project team which dimensions have influenced the effect.

Team Cohesion & Coordination

- ◯ Gender
- ◯ Age
- ◯ Language
- ◯ Nationality/Origin
- ◯ Race/Religion
- ◯ Education/Knowledge
- ◯ Functional Background
- ◯ Experience
- ◯ Organisational Tenure
- ◯ Team Tenure
- ◯ ⊗Not applicable

Support of Complex Systems (like teams)

- ◯ Gender
- ◯ Age
- ◯ Language
- ◯ Nationality/Origin
- ◯ Race/Religion
- ◯ Education/Knowledge
- ◯ Functional Background
- ◯ Experience
- ◯ Organisational Tenure
- ◯ Team Tenure
- ◯ ⊗Not applicable

Cooperation

- ◯ Gender
- ◯ Age
- ◯ Language

○ Nationality/Origin

○ Race/Religion

○ Education/Knowledge

○ Functional Background

○ Experience

○ Organisational Tenure

○ Team Tenure

○ ⊗Not applicable

Creativity

○ Gender

○ Age

○ Language

○ Nationality/Origin

○ Race/Religion

○ Education/Knowledge

○ Functional Background

○ Experience

○ Organisational Tenure

○ Team Tenure

○ ⊗Not applicable

Innovation

○ Gender

○ Age

○ Language

○ Nationality/Origin

○ Race/Religion

○ Education/Knowledge

○ Functional Background

○ Experience

○ Organisational Tenure

○ Team Tenure

○ ⊗Not applicable

Decision-making

○ Gender

○ Age

○ Language

○ Nationality/Origin

○ Race/Religion

○ Education/Knowledge

○ Functional Background

○ Experience

○ Organisational Tenure

○ Team Tenure

○ ⊗Not applicable

Less Flexibility

○ Gender

○ Age

○ Language

○ Nationality/Origin

○ Race/Religion

○ Education/Knowledge

○ Functional Background

○ Experience

○ Organisational Tenure

○ Team Tenure

○ ⊗Not applicable

Task Conflicts: Constructive Criticism

○ Gender

○ Age

○ Language

○ Nationality/Origin

○ Race/Religion

○ Education/Knowledge

○ Functional Background

○ Experience

○ Organisational Tenure

○ Team Tenure

○ ⊗Not applicable

Task Conflicts: Enhancing Performance on Cognitive Tasks

○ Gender

○ Age

○ Language

○ Nationality/Origin

○ Race/Religion

○ Education/Knowledge

○ Functional Background

○ Experience

○ Organisational Tenure

○ Team Tenure

○ ⊗Not applicable

Relationship Conflicts: Negative emotions, Frustration, Anxiety

○ Gender

○ Age

○ Language

○ Nationality/Origin

○ Race/Religion

○ Education/Knowledge

○ Functional Background

○ Experience

○ Organisational Tenure

○ Team Tenure

○ ⊗Not applicable

Process Conflicts: Disagreements about the logistics of a task & Separation of Responsibilities

○ Gender

○ Age

○ Language

○ Nationality/Origin

○ Race/Religion

○ Education/Knowledge

○ Functional Background

○ Experience

○ Organisational Tenure

○ Team Tenure

○ ⊗Not applicable

7.   Please indicate for each effect whether it has positive or negative influence on the <u>atmosphere</u> of the project team.

	Negative	Somewhat negative	Neither positive nor negative (no influence)	Somewhat positive	Positive
Team Cohesion & Coordination	○	○	○	○	○
Support of Complex Systems (like teams)	○	○	○	○	○
Cooperation	○	○	○	○	○
Creativity	○	○	○	○	○
Innovation	○	○	○	○	○
Decision-making	○	○	○	○	○
Less Flexibility	○	○	○	○	○
Task conflicts: Constructive Criticism	○	○	○	○	○
Task Conflicts: Enhancing Performance on Cognitive Tasks	○	○	○	○	○
Relationship Conflicts: Negative emotions, Frustration, Anxiety	○	○	○	○	○
Process conflicts: Disagreements about the logistics of a task	○	○	○	○	○

8.   Are there more effects of diversity that have an influence on the <u>atmosphere</u> of the team, that are not listed, and if yes which?

_____

9.   Please indicate for each effect whether it has positive or negative influence on the performance of the project.

	Negative	Somewhat negative	Neither positive nor negative (no influence)	Somewhat positive	Positive
Team Cohesion & Coordination	◯	◯	◯	◯	◯
Support of Complex Systems (like teams)	◯	◯	◯	◯	◯
Cooperation	◯	◯	◯	◯	◯
Creativity	◯	◯	◯	◯	◯
Innovation	◯	◯	◯	◯	◯
Decision-making	◯	◯	◯	◯	◯
Less Flexibility	◯	◯	◯	◯	◯
Task conflicts: Constructive Criticism	◯	◯	◯	◯	◯
Task Conflicts: Enhancing Performance on Cognitive Tasks	◯	◯	◯	◯	◯
Relationship Conflicts: Negative emotions, Frustration, Anxiety	◯	◯	◯	◯	◯
Process conflicts: Disagreements about the logistics of a task	◯	◯	◯	◯	◯

10.   Are there more effects of diversity that have an influence on the performance of the project, that are not listed, and if yes which?

_____

Part 4: The company

1.   **What is the approximate total number of employees in the company?**

○ 1-49 employees

○ 50-999 employees

○ 1000-4999 employees

○ 5000 or more employees

○ Prefer not to say

2.   **Please select one response for each statement**

	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
The company encourages diversity	○	○	○	○	○
The company fosters a workplace that allows employees to be themselves	○	○	○	○	○
The company and the employees respect diverse values/opinions/views	○	○	○	○	○
All employees have the opportunity for a career development path in the company	○	○	○	○	○

Appendix B: Survey detailed results

The Appendix presents the figures and tables that were excluded from the main body of the report in Chapter 4. The numbering of the questions is coded, in the form of PX.QX, with P representing the Part of the questionnaire in which the question belongs, and Q the respective question.

P1.Q1: What is your gender?
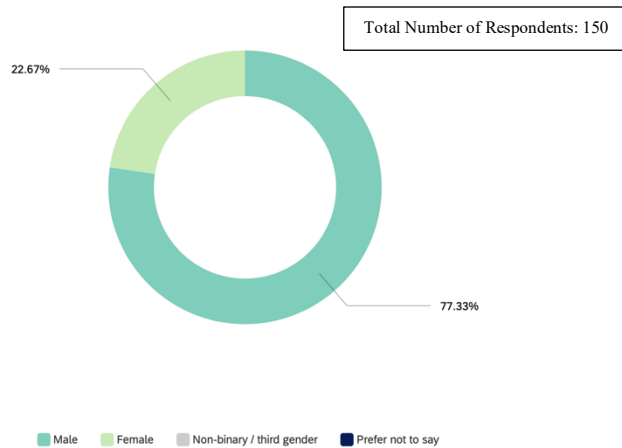
Figure B.1 The gender of the respondents

P1.Q3: What is your highest level of education?
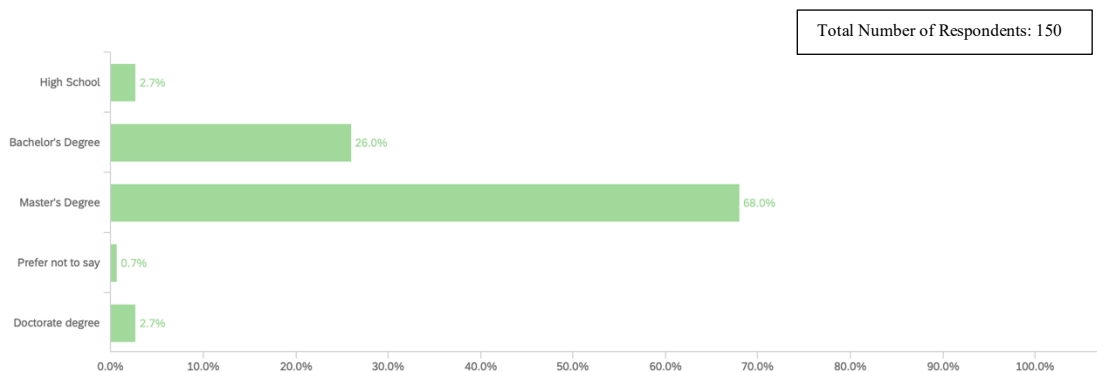
Figure B.2 The highest level of education of the participants

P1.Q4: What is your study background?
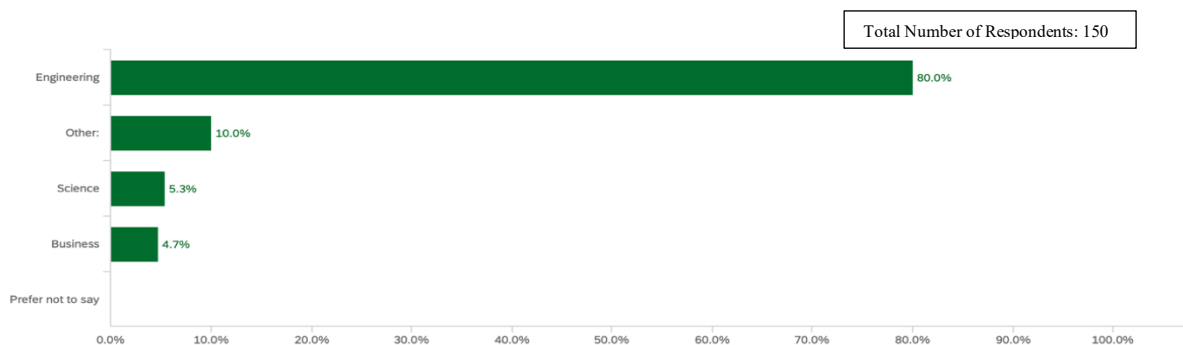
Figure B.3 The study background of the respondents

P2.Q3: What is the role of the company in the project?
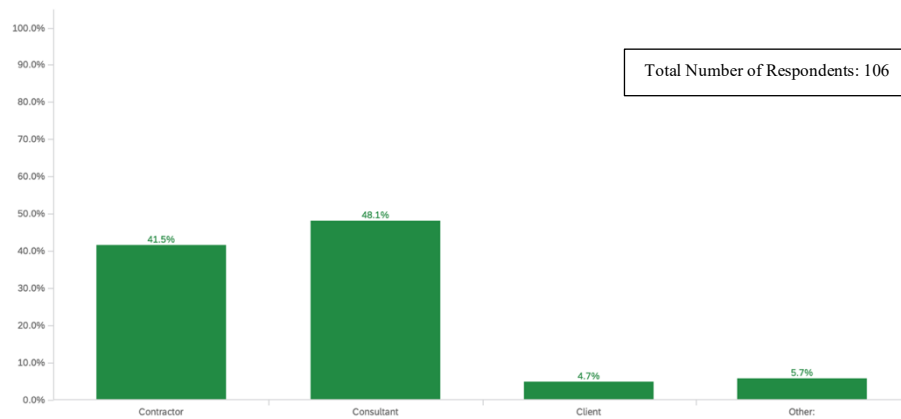
Figure B.4 The role of the company

P2.Q4: To which project phase/phases will your answers be focused?

Figure B.5 The project phases in which the answers were focused

P3.Q1: How would you assess the following diversity dimensions in your project team?

Figure B.6 The degree to which each diversity dimension is recognized in the project team

Table B.1 The degree to which each diversity dimension is recognized in practice – Values per option

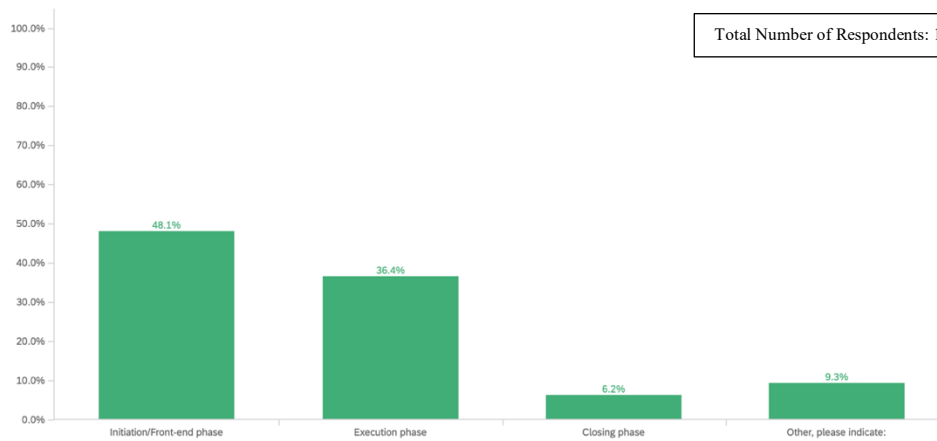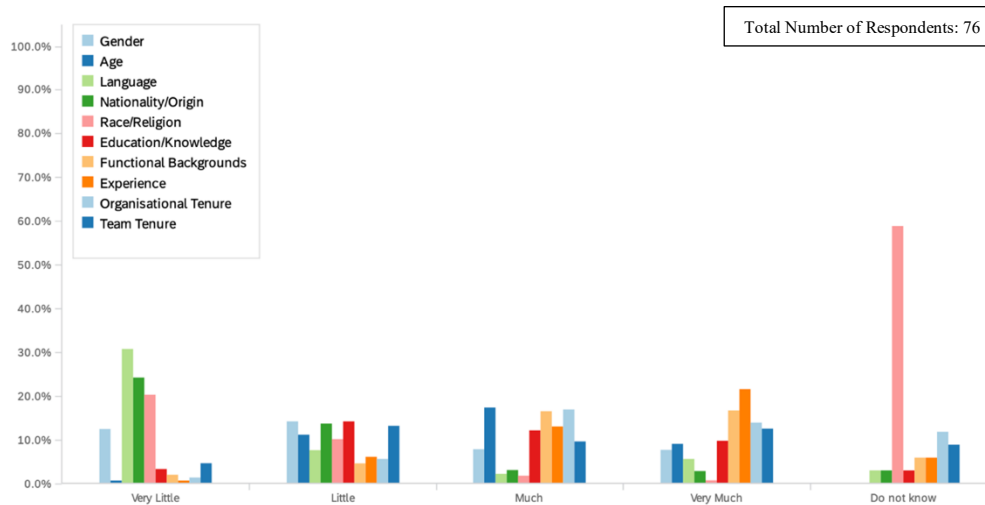| #	Field	Very Little		Little		Much		Very Much		Do not know		Total
1	Gender	25.00%	19	36.84%	28	23.68%	18	14.47%	11	0.00%	0	76
2	Age	1.32%	1	28.95%	22	52.63%	40	17.11%	13	0.00%	0	76
3	Language	61.84%	47	19.74%	15	6.58%	5	10.53%	8	1.32%	1	76
4	Nationality/Origin	48.68%	37	35.53%	27	9.21%	7	5.26%	4	1.32%	1	76
5	Race/Religion	40.79%	31	26.32%	20	5.26%	4	1.32%	1	26.32%	20	76
6	Education/Knowledge (there is a variety of education and knowledge background in the team)	6.58%	5	36.84%	28	36.84%	28	18.42%	14	1.32%	1	76
7	Functional Backgrounds (team consisting of a variety of functional backgrounds/expertise)	3.95%	3	11.84%	9	50.00%	38	31.58%	24	2.63%	2	76
8	Experience (variety in the years of experience among the team members)	1.32%	1	15.79%	12	39.47%	30	40.79%	31	2.63%	2	76
9	Organisational Tenure (Seniority, type of employment, different periods of joining the organization)	2.63%	2	14.47%	11	51.32%	39	26.32%	20	5.26%	4	76
10	Team Tenure (different periods in which the members joined the team)	9.21%	7	34.21%	26	28.95%	22	23.68%	18	3.95%	3	76

P3.Q5 Effects triggered by the diversity dimensions

In this section the detailed results for all effects and dimensions are displayed. The categorization is being made based on each effect. In each case, the Figure illustrates the results as a percentage of responses, for instance in the Team Cohesion & Coordination effect is triggered by Experience dimension according to 75,3% of the respondents. The table that accompanies the figure, presents the same results, but this time as a percentage of choices. The total number of respondents is 74 for all the effects.

Team Cohesion & Coordination
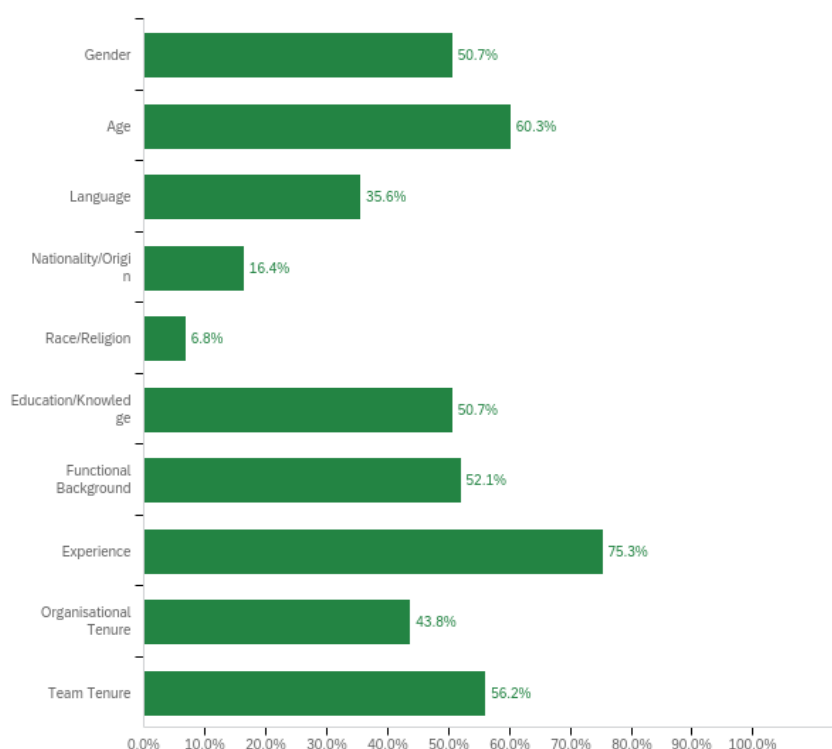
Answer	%	Count
Gender	11.31%	37
Age	13.46%	44
Language	7.95%	26
Nationality/Origin	3.67%	12
Race/Religion	1.53%	5
Education/Knowledge	11.31%	37
Functional Background	11.62%	38
Experience	16.82%	55
Organisational Tenure	9.79%	32
Team Tenure	12.54%	41
Total	100%	327

Support of Complex Systems (like teams)
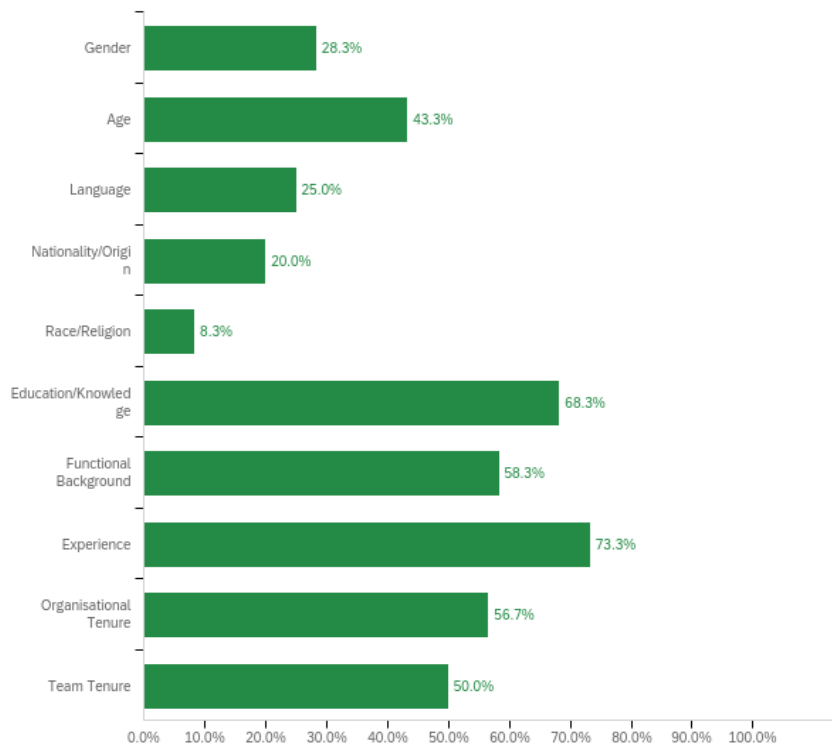
Answer	%	Count
Gender	6.56%	17
Age	10.04%	26
Language	5.79%	15
Nationality/Origin	4.63%	12
Race/Religion	1.93%	5
Education/Knowledge	15.83%	41
Functional Background	13.51%	35
Experience	16.99%	44
Organisational Tenure	13.13%	34
Team Tenure	11.58%	30
Total	100%	259

Cooperation
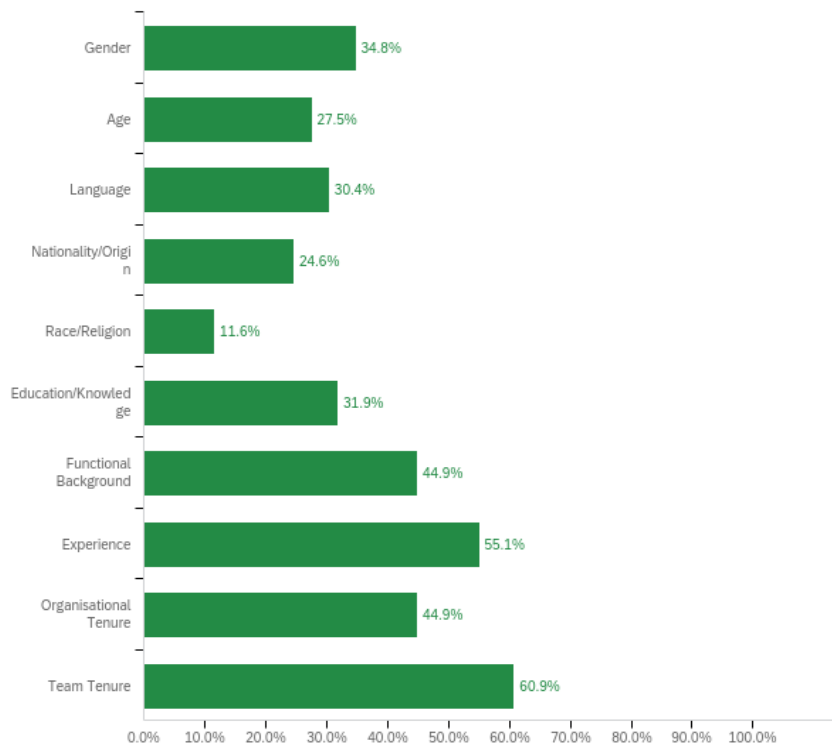
Answer	%	Count
Gender	9.49%	24
Age	7.51%	19
Language	8.30%	21
Nationality/Origin	6.72%	17
Race/Religion	3.16%	8
Education/Knowledge	8.70%	22
Functional Background	12.25%	31
Experience	15.02%	38
Organisational Tenure	12.25%	31
Team Tenure	16.60%	42
Total	100%	253

Creativity
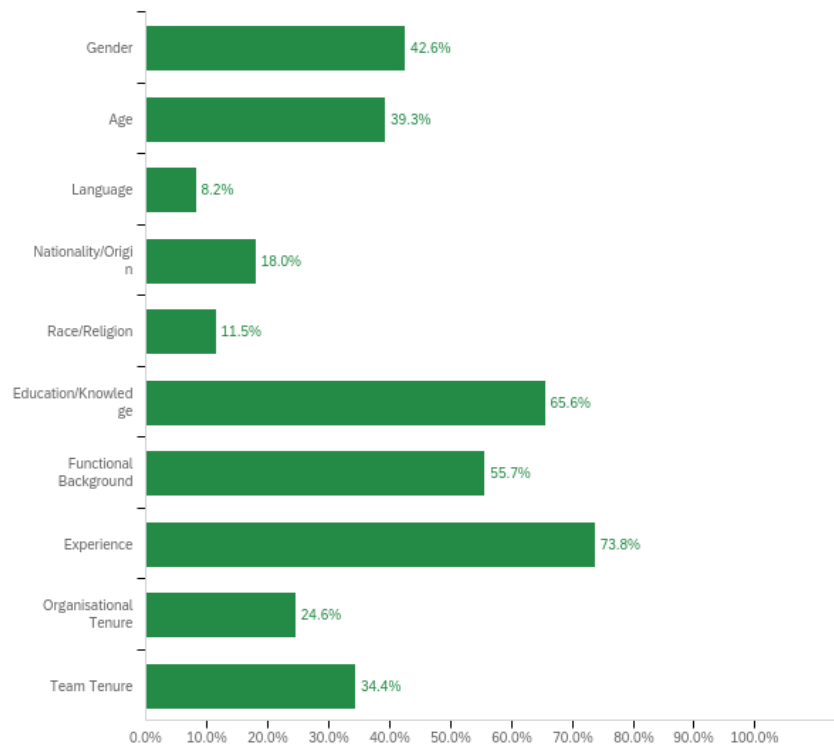
Answer	%	Count
Gender	11.40%	26
Age	10.53%	24
Language	2.19%	5
Nationality/Origin	4.82%	11
Race/Religion	3.07%	7
Education/Knowledge	17.54%	40
Functional Background	14.91%	34
Experience	19.74%	45
Organisational Tenure	6.58%	15
Team Tenure	9.21%	21
Total	100%	228

Innovation
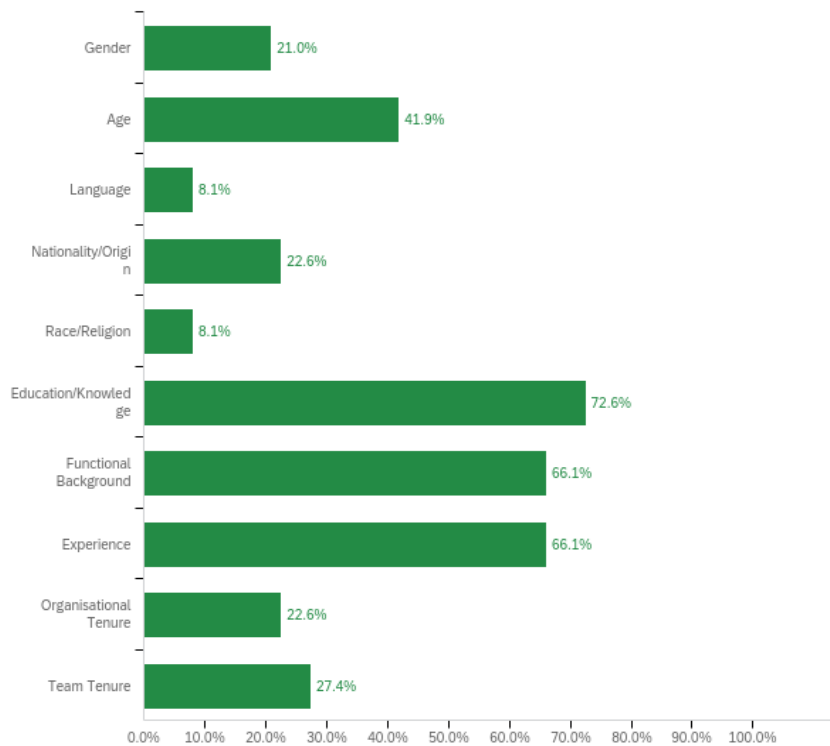
Answer	%	Count
Gender	5.88%	13
Age	11.76%	26
Language	2.26%	5
Nationality/Origin	6.33%	14
Race/Religion	2.26%	5
Education/Knowledge	20.36%	45
Functional Background	18.55%	41
Experience	18.55%	41
Organisational Tenure	6.33%	14
Team Tenure	7.69%	17
Total	100%	221

Decision-making
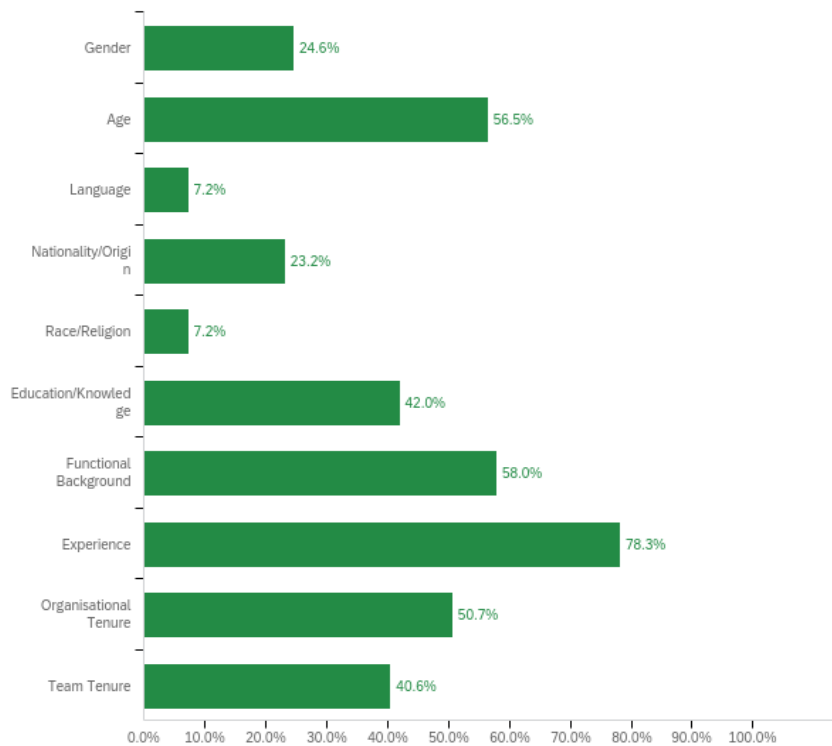
Answer	%	Count
Gender	6.34%	17
Age	14.55%	39
Language	1.87%	5
Nationality/Origin	5.97%	16
Race/Religion	1.87%	5
Education/Knowledge	10.82%	29
Functional Background	14.93%	40
Experience	20.15%	54
Organisational Tenure	13.06%	35
Team Tenure	10.45%	28
Total	100%	268

Less Flexibility
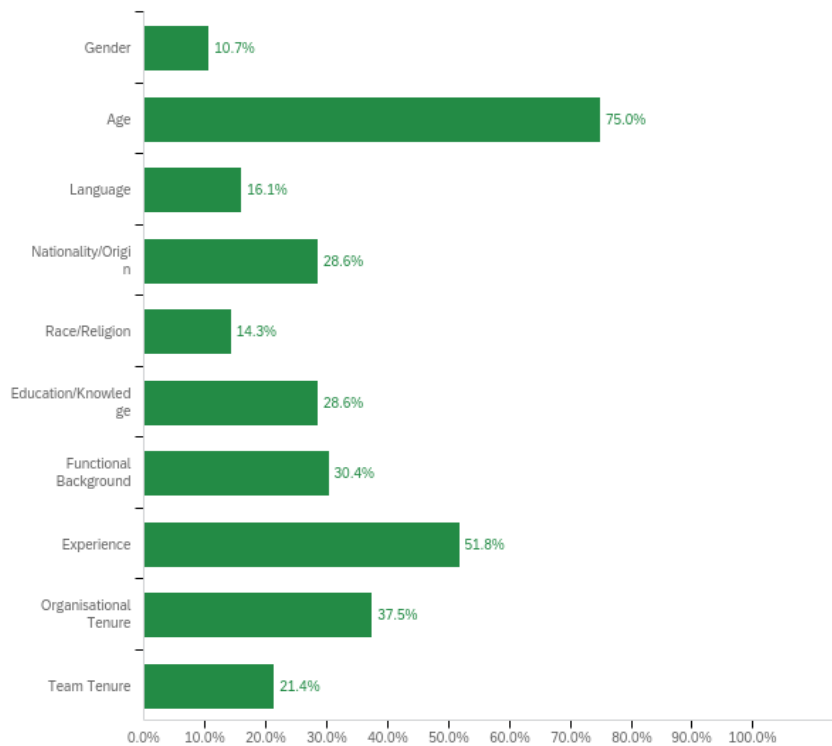
Answer	%	Count
Gender	3.41%	6
Age	23.86%	42
Language	5.11%	9
Nationality/Origin	9.09%	16
Race/Religion	4.55%	8
Education/Knowledge	9.09%	16
Functional Background	9.66%	17
Experience	16.48%	29
Organisational Tenure	11.93%	21
Team Tenure	6.82%	12
Total	100%	176

Task Conflicts: Constructive Criticism
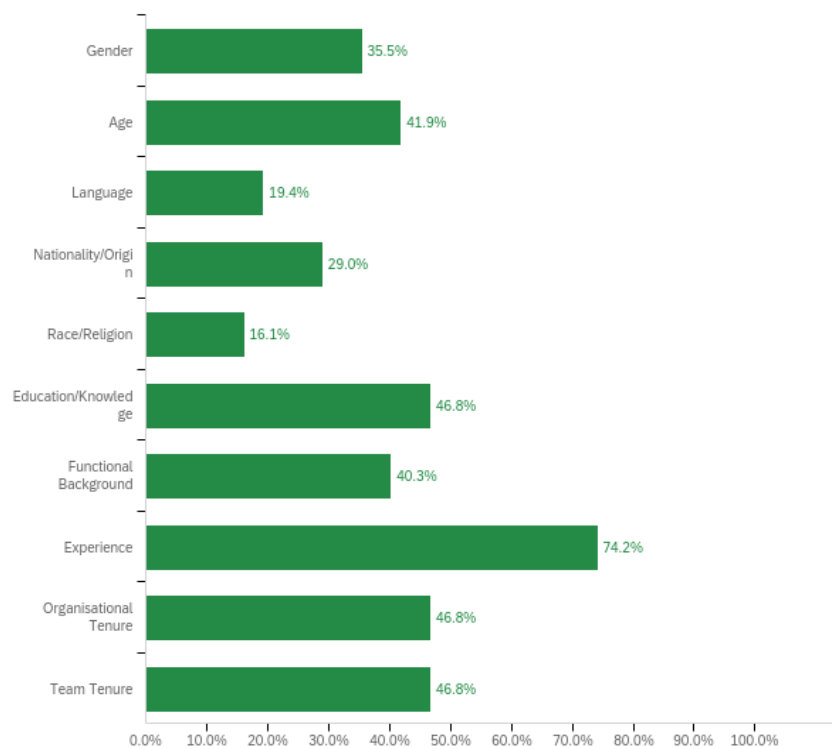
Answer	%	Count
Gender	8.94%	22
Age	10.57%	26
Language	4.88%	12
Nationality/Origin	7.32%	18
Race/Religion	4.07%	10
Education/Knowledge	11.79%	29
Functional Background	10.16%	25
Experience	18.70%	46
Organisational Tenure	11.79%	29
Team Tenure	11.79%	29
Total	100%	246

Task Conflicts: Enhancing Performance on Cognitive Tasks
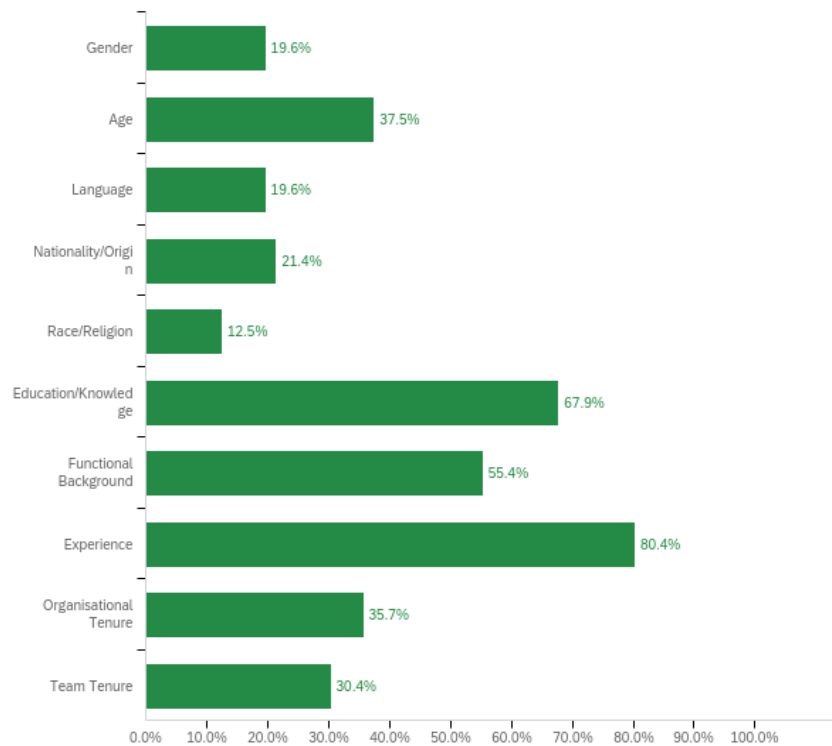
Answer	%	Count
Gender	5.16%	11
Age	9.86%	21
Language	5.16%	11
Nationality/Origin	5.63%	12
Race/Religion	3.29%	7
Education/Knowledge	17.84%	38
Functional Background	14.55%	31
Experience	21.13%	45
Organisational Tenure	9.39%	20
Team Tenure	7.98%	17
Total	100%	213

Relationship Conflicts: Negative emotions, Frustration, Anxiety
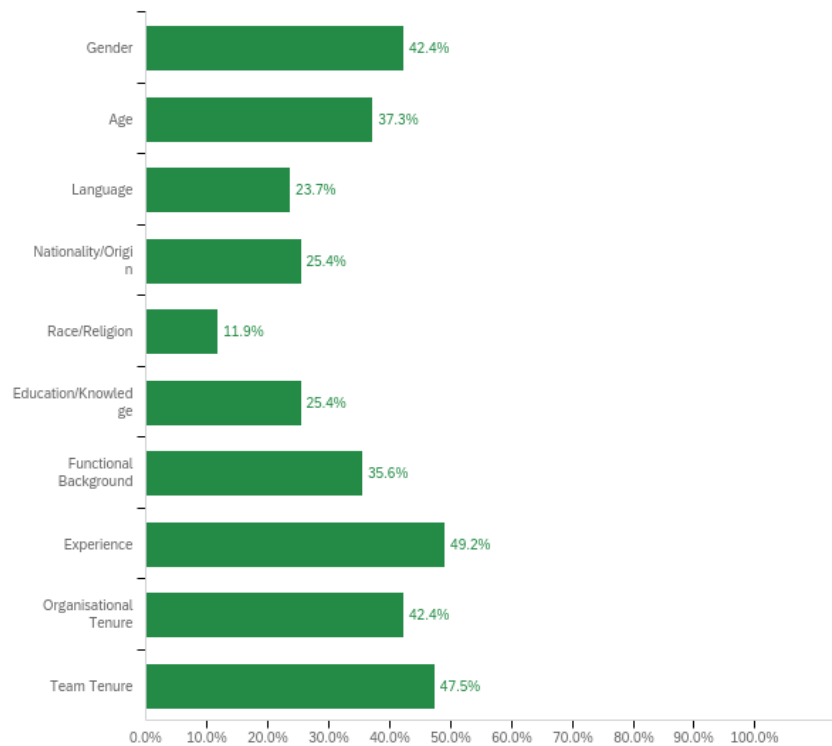
Answer	%	Count
Gender	12.44%	25
Age	10.95%	22
Language	6.97%	14
Nationality/Origin	7.46%	15
Race/Religion	3.48%	7
Education/Knowledge	7.46%	15
Functional Background	10.45%	21
Experience	14.43%	29
Organisational Tenure	12.44%	25
Team Tenure	13.93%	28
Total	100%	201

Process Conflicts: Disagreements about the logistics of a task & Separation of Responsibilities
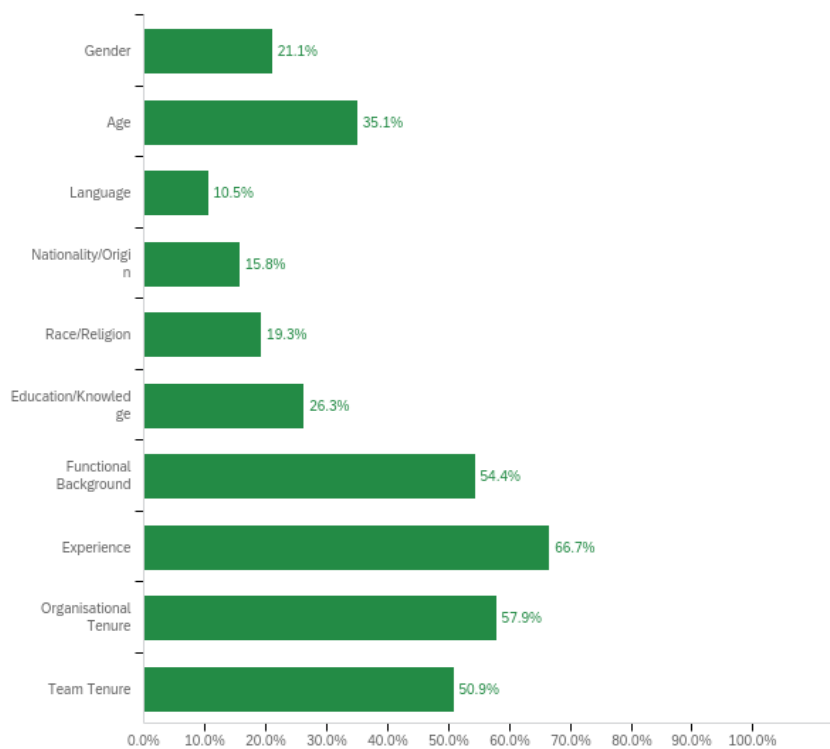
Answer	%	Count
Gender	5.88%	12
Age	9.80%	20
Language	2.94%	6
Nationality/Origin	4.41%	9
Race/Religion	5.39%	11
Education/Knowledge	7.35%	15
Functional Background	15.20%	31
Experience	18.63%	38
Organisational Tenure	16.18%	33
Team Tenure	14.22%	29
Total	100%	204

P3.Q7 Influence of each effect on the atmosphere of the team

Table B.2 The influence of each effect to the atmosphere of the project team

#	Field	Negative	Somewhat negative	Neither positive nor negative (no influence)	Somewhat positive	Positive	Total
1	Team Cohesion & Coordination	0.00% 0	1.35% 1	4.05% 3	17.57% 13	77.03% 57	74
2	Support of Complex Systems (like teams)	0.00% 0	4.05% 3	24.32% 18	36.49% 27	35.14% 26	74
3	Cooperation	0.00% 0	0.00% 0	4.05% 3	21.62% 16	74.32% 55	74
4	Creativity	0.00% 0	1.35% 1	25.68% 19	29.73% 22	43.24% 32	74
5	Innovation	0.00% 0	4.05% 3	35.14% 26	31.08% 23	29.73% 22	74
6	Decision-making	0.00% 0	9.46% 7	13.51% 10	31.08% 23	45.95% 34	74
7	Less Flexibility	28.38% 21	54.05% 40	13.51% 10	4.05% 3	0.00% 0	74
8	Task conflicts: Constructive Critisism	4.05% 3	12.16% 9	21.62% 16	43.24% 32	18.92% 14	74
9	Task Conflicts: Enhancing Performance on Cognitive Tasks	4.05% 3	12.16% 9	39.19% 29	33.78% 25	10.81% 8	74
10	Relationship Conflicts: Negative emotions, Frustration, Anxiety	55.41% 41	24.32% 18	12.16% 9	8.11% 6	0.00% 0	74
11	Process conflicts: Disagreements about the logistics of a task	37.84% 28	37.84% 28	14.86% 11	8.11% 6	1.35% 1	74

P3.Q9 Influence of each effect on project performance

Table B.3 The influence of each effect to the performance of the project

#	Field	Negative	Somewhat negative	Neither positive nor negative (no influence)	Somewhat positive	Positive	Total
1	Team Cohesion & Coordination	0.00% 0	1.35% 1	4.05% 3	18.92% 14	75.68% 56	74
2	Support of Complex Systems (like teams)	0.00% 0	2.70% 2	18.92% 14	27.03% 20	51.35% 38	74
3	Cooperation	0.00% 0	1.35% 1	4.05% 3	18.92% 14	75.68% 56	74
4	Creativity	0.00% 0	1.35% 1	13.51% 10	37.84% 28	47.30% 35	74
5	Innovation	0.00% 0	6.76% 5	29.73% 22	32.43% 24	31.08% 23	74
6	Decision-making	1.35% 1	1.35% 1	13.51% 10	24.32% 18	59.46% 44	74
7	Less Flexibility	29.73% 22	33.78% 25	24.32% 18	10.81% 8	1.35% 1	74
8	Task conflicts: Constructive Critisism	4.05% 3	5.41% 4	18.92% 14	44.59% 33	27.03% 20	74
9	Task Conflicts: Enhancing Performance on Cognitive Tasks	4.05% 3	8.11% 6	25.68% 19	47.30% 35	14.86% 11	74
10	Relationship Conflicts: Negative emotions, Frustration, Anxiety	44.59% 33	25.68% 19	18.92% 14	6.76% 5	4.05% 3	74
11	Process conflicts: Disagreements about the logistics of a task	36.49% 27	32.43% 24	18.92% 14	8.11% 6	4.05% 3	74

Appendix C: The evaluation process

The Appendix presents the summaries of the evaluation meetings with the experts. In total four meetings were arranged, with representatives of two organizations. The intention was to have to experts from each organization, one project manager and one HR manager. The full transcripts of the interviews are available upon request.

Expert Meeting 1, HR Manager 1

Organizational Tenure: Focus should be given not on the organizational tenure itself, for instance when the employees join the organization, but on the way of working together, which depends on how long someone is working in the organization, what kind of person he/she is and how he/she fits to the whole team. Of course, team bonding is crucial, as well as the onboarding process. It is also considered that in larger companies the onboarding process may be more challenging than in smaller companies. Nonetheless, the onboarding process is challenging, and needs special attention. In her organization, there is a guide that includes all essential steps that need to be followed both by the new member and by the team manager. But still the most challenging part is finding the time to accommodate the process. Consequently, it is mostly a matter of time.

Functional Background: The linear relationship between diversity in functional background and the size of the company may be a result of the fact that many people do work on the same project and the exchange of experts is easier between the teams when needed. This diversity has a positive influence on innovation and decision-making, hence on the whole project.

Age: It is true that the older employees have valuable experience while younger employees have more knowledge on new technologies and methods. It is frequently difficult for the elder to change their working habits or to accept what the younger people can bring. For this reason, their company always tries to take the people along with the new wave, where they try to educate them on new technological evolutions or change their perspective. This is not always successful, however their experience and knowledge is essential and should be passed on the new generations. Even though is challenging, the process is ameliorated year by year.

Gender: The company really believes in and encourages gender diversity. It is considered that women bring other competences to the team, which improve decision-making. Moreover, the performance of the team, and eventually of the project becomes better, because problems and issues are spoken out from all different angles. To date, there is not enough evidence that gender diversity is connected to relationship conflicts, so the finding cannot be verified. On the contrary, the observations indicated the need for the increase of gender diversity, even though the field is still not only male-dominated, but there are still men who believe that women cannot perform at the same level as men can do.

Team Tenure: It is true that it is more beneficial if there is team tenure, but it is also not necessary that the existence of team tenure would increase conflicts. It is possible that conflicts are mostly related to unsuccessful team bonding and not per se to the joining of new members. But the longevity of the team is highly dependent on the nature of each project and its needs. It is always helpful to retain the

composition of a team, but not always possible. When problems or conflicts arise, interventions start, with an external coach if needed, to tackle the challenging aspects.

Expert Meeting 2, Project Manager 1

Organizational Tenure: Even though the interviewee recognizes that the dimension is more present in large companies and in medium sized teams, it is mentioned that her organization is less diverse in terms of organizational tenure, since most employees that join the organization continue working there for decades, while the younger employees that join them have no or little experience. While the existence of task or process conflicts is recognized, the most important observation is that the teams are not very aware of this mechanism, and consequently of how to handle this aspect.

Functional Background: The linear relationship is logical because the more people that form the company the more the possibilities to have several interfaces. However, the project organization can actually be multiple companies. As a result, there is a doubt about this connection, because it is more about diversity in the project team, which can also be reached by other mechanisms. Multiple disciplines can also be organized by partnering up with other companies. And having them in the project team is what is necessary when considering project performance. What is more, there is a doubt concerning decision-making. The quality of decision-making constitutes one parameter, while the process of decision-making constitutes another parameter. Based on that, the quality can be benefited because of the different perspectives, but the process can also be disturbing due to the combination of different worlds.

Age: In this dimension, is the process of decision-making that is benefited, and not the quality. It is probably the willingness to explain and the lack of experience that open up new possibilities, so this is the reason why better decision-making is achieved. When considering flexibility, it is more of what age brings as a quality, like a better side on the risks and some other elements. A personal example is that the goal is not only the project to be well delivered, but also the company to continue existing or the payments to be arranged on time and so on. It is very important that flexibility should be balanced with experience and risks. Thus, the observation of reduced flexibility should be considered more like a point of attention rather than a fact of life.

Gender: The observation that gender diversity is more present in smaller teams may be related to the lack of females in the sector. Because it is not only based on the absolute numbers, but also on the fact that most of the females of the sector are mostly engineers and not in senior positions. Consequently, it is normal that they may be part of smaller project teams and projects. The conflicts that are observed may originate from the observation that female leaders usually have a more holistic point of view and a project-oriented goal setting rather than organizational- and personal-oriented goal setting. But exactly because of the different perspectives, these complexes should be spoken out, benefiting the project. Based on this, in more balanced condition (gender diversity), the same exchange of opinions would feel more like a discussion rather than a conflict. To this end, it may be the way of perceiving the conflicts because of the unbalanced situation that creates the negative influence, while in a more balanced condition the same context would create a constructive dialogue.

Team Tenure: The effects triggered are recognized, especially in medium sized teams as observed. Even in extensive teams (counting 100-150 members) there is a core of 20 to 40 people that are continuously present in the project, while a lot of people that coming in and out. This is also beneficial for speeding up things and different task or different knowledge. So this team size may actually be beneficial for the triggered effects.

Expert Meeting 3, Project Manager 2

Organizational Tenure: The dimension is recognized, mentioning the fact that the conflicts may emerge because of the exchange of knowledge and experience between the younger and the elder. Because younger employees work in a more digitized way, that helps the older generation, and the other way around, the older generation has more experience and helps the younger generation. Nevertheless, the dimension even if present, is not considered as an important dimension.

Functional Background: Yes, the dimension can have a positive effect on decision-making and innovation. Though, it may be hard to accomplish because it is difficult to merge the ideas of people with different expertise. Plus, it can be beneficial for innovation, but probably problematic for decision-making. After all, when all this expertise is needed, there is no control on whether minimizing or maximizing it, it is just a given fact.

Age: It is true that older people might not be so flexible to change their ways or methods of working. But somehow, they will be forced to do so, and bringing the best of both wheels together leads to better decision-making. It is beneficial to introduce new ways of working through younger people but is also good to stick to some old good experiences. It is challenging, but its effects are more clear than the ones of the other dimensions. Team composition is better when there is a good mixture of all age groups, so a proper interaction of all ages is desired. Nevertheless, the design departments are comprised more of younger people, probably because when getting older many employees become managers.

Gender: The observation that relates gender diversity to relationship conflicts creates a new perspective because first, the lack of diversity within the organization constitutes it less diverse, and second, this connection leads to a new point of view. Still, it is that potentially the increase in gender diversity would minimize conflicts because the attitude and reactions of males would be affected, and this imbalance would be tackled. Because different content would enter, with new competences that are much needed, and this is an extra reason why gender diversity would benefit not only the projects but the whole industry.

Team Tenure: The dimension is very practical based. The decisions about the composition of the team are driven by the needs of the project each time, while this is one of the main reasons why the teams change frequently and having exactly the same team working together again is usually a coincidence and not a choice. However, there is a tendency to collaborate with the same partners, the same joint ventures, that assists in minimizing negative effects. And in order to maximize the atmosphere and the performance of the team the onboarding programs are very important. In these programs people learn about the project, the way of working and the processes.

Organizational Tenure: The presence of more organizational tenure is larger companies is logical. Many parties join in such companies, while in a smaller startup for instance, there are more chances that a lot of people join at the same time. The related effects can also be due to the existing seniority. Having a lot of diversity present can lead to more explicit discussions about the tasks. The seniors tend to guide the juniors, implicating the ways that the tasks should be undertaken, but these explanations can either be helpful or create tension. However, when the same levels of seniority exist, this is also challenging. The perception of mutual understanding between colleagues working together for too long constitutes discussions more implicit, and this can also lead to conflicts. When asked about the importance of the onboarding process, the expert mentioned that it is mainly a matter of attitude. It is true that organizations in the construction industry follow too short onboarding processes, and the new member has to undertake tasks soon. The process is based on mutual understanding and guidance by the manager and the other members of the organization, therefore the attitude in this process is crucial.

Functional Background: Yes, the dimension is more present in larger companies due to the plethora of projects and the different kinds of customers. Regarding Decision-making, it is true that it benefits from the many different ways of thinking and the inputs that functional background diversity adds. It assists in a more holistic approach, but not necessarily in the satisfaction of all sides. Consequently, the process of decision-making may be more difficult. The beneficial observations of innovation are also true since innovation in practice is always present in the interfaces between the disciplines.

Age: In terms of Age, the different angles of approaching the tasks can boost problem solving, under the condition that all members want and feel free to express their opinion. The difficulty lies in the more dominant character that older members may have, that make younger members feel restricted in expressing their opinions, but also the older members themselves in proposing new ideas. This is why Flexibility may sometimes be restricted. The mechanism is similar to the one of Organizational Tenure and it depends on the extent to which discussion is encouraged and the opinions are shared explicitly.

Gender: The conflicts that are observed may be result of different communication, goals and competition between the genders. They may also be related to the lack of female leaders in hierarchy, as well as to the positive discrimination that exists towards this. Aiming to correct gender equality in the company and in hierarchy leads to gender inequity due to the positive discrimination. On account of that relationship conflicts may occur when following that positive discrimination policy. However, when the desired level of equality is reached, the increased Gender diversity will indeed minimize conflicts. It is the transition to more Gender diversity that leads to these actions and observations.

Team Tenure: I am a strong supporter of changing team compositions frequently. In this way, aspects like the knowledge exchange, creativity and flexibility are retained in high levels. But changes should be arranged gradually and by keeping balance on the tasks and responsibilities that each member has. Gradual transition to the new composition is essential to avoid the negative consequences that hurried changes may create. The existence of more Relationship conflicts because of the team tenure diversity is not recognized, but they can actually be a result of poor team bonding.