# Cultural Awareness in EPC projects

Msc Construction Management Engineering

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TU Delft

# Cultural Awareness in EPC projects

By

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# Executive Summary

Although the interaction among people and organizations from different cultures is one of the greatest challenges evident in large Engineering, Procurement, and Construction (EPC) projects, there is limited cross-cultural research to support its comprehension (Ofori & Toor, 2009).

In that regard, this research was developed to explore the cultural considerations that create awareness among practitioners in the EPC industry and develop recommendations to support future EPC projects.

This thesis explores the cultural considerations that create awareness among practitioners in the EPC industry and develops recommendations to support future EPC projects. The objective is to provide EPC project leaders with findings and insights on how cultural elements affect collaboration in future EPC projects, and how awareness of culture impacts project execution.

Projects often involve culturally diverse teams from different countries, backgrounds, and cultures working concurrently, which often creates communication and collaboration challenges (Blanco et al, 2019).

The main purpose of this thesis is to consider how awareness of cultural elements affects collaboration in future EPC projects and propose pragmatic proposals for improving collaboration. To facilitate this endeavor, the main research question is broken down into four sub-questions dedicated to understanding how cultural awareness could affect collaboration in future EPC projects. The main research question and sub-questions are illustrated in Figure 1.

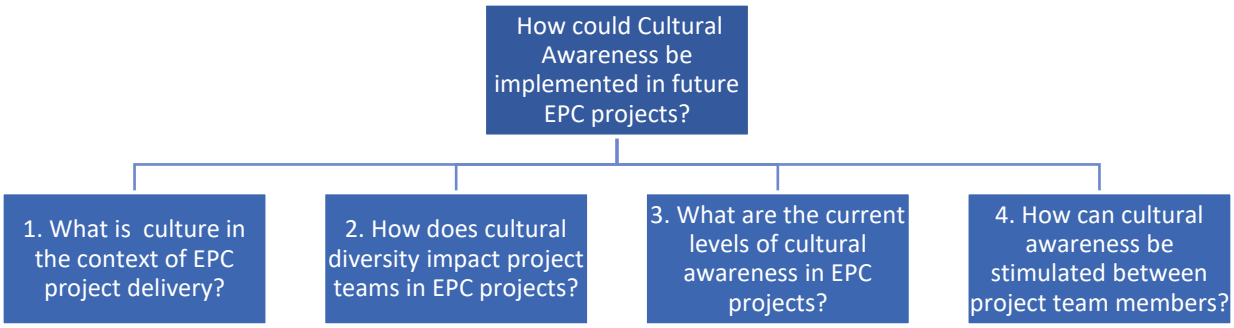


*Figure 1- Main research question and supporting sub-questions.*

This thesis is split into three distinct phases to answer the main research question. The first phase focused on a literature review to set a theoretical basis for the research. Phase two conducted interviews oriented toward understanding the current levels of cultural awareness in EPC projects and the relationship between cultural diversity and project execution.

The results of phases one and two are combined to formulate the basis for recommendations and gaps to develop a solution. Phase three combines the review of documents and develops a solution based on recommendations of the research, this is further validated through expert evaluation in the form of interviews.  A summary of each phase is illustrated in Figure 2.

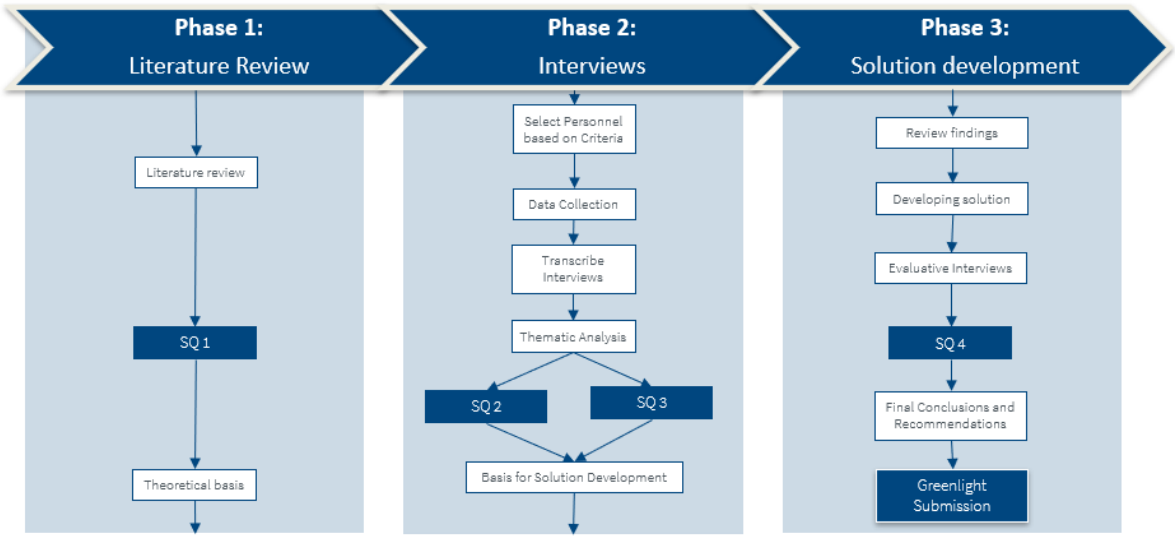


*Figure 2- Breakdown of phases of the thesis.*

The research was initiated by conducting a literature review to understand the concept of culture in the context of EPC projects. As a result, Culture was observed to be both an individual and social entity, resulting in needing to understand oneself as well as others.

The term was conceived to be holistic, and therefore difficult to define. Culture represents a combination of values, behaviors, and actions exerting a profound impact on the cognitive processes and social mechanisms occurring in a project lifecycle. Findings from this research underscore the relevance of a precise definition due to the dynamic and evolutionary nature of the concept. Rather, it was recommended that project teams engage in active collaboration to find the different elements associated with culture. This research identified layers of culture to serve as a starting point for the effective integration of cultural awareness in EPC projects.

To facilitate its understanding, the concept of culture was broken down into different layers including national culture, industrial culture, organizational culture, professional culture, and more. Moreover, it was uncovered that different projects may have different layers of culture predominant in their existence. Culture in EPC projects can be described as the collection of unwritten rules that are shared between groups of people (Hofstede, 2001) and have an impact on the positive and negative symptoms associated with conducting EPC projects.

Following the literature review, interviews were undertaken to analyze the current levels of cultural awareness in EPC projects and the relationship between cultural diversity and project

execution. A group of Twenty-one managers across five projects from different disciplines (Project Management, Project Controls, Procurement, Engineering, and Construction) were interviewed.

The results conveyed that there were no key guidelines or frameworks that aligned different projects in how they approached cultural awareness. Projects varied in terms of the levels of cultural awareness, this primarily related to the project manager's strategy for project execution, and since cultural awareness was not mandatory to monitor, it was sometimes neglected.

If cultural awareness activities were undertaken, they were usually only conducted at one point in the project lifecycle, often near kickoff. The interviews suggested that this conflicted with the nature of EPC project executions which involved an evolving variety of stakeholders as the project timeline elapsed. Furthermore, the results of the interview argued that authentic practices with recurring applications are necessary to improve cultural awareness in future EPC projects.

Following the interview phase, the results of the literature review and the interviews were combined to find a solution setting a guideline for stimulating cultural awareness among project teams. Eight elements were discovered to be important based on the findings of the thesis. To break down the levels of operation in an EPC firm, four levels were selected to investigate cultural awareness: corporate level, office level, project level, and individual level as conveyed in Figure 3.

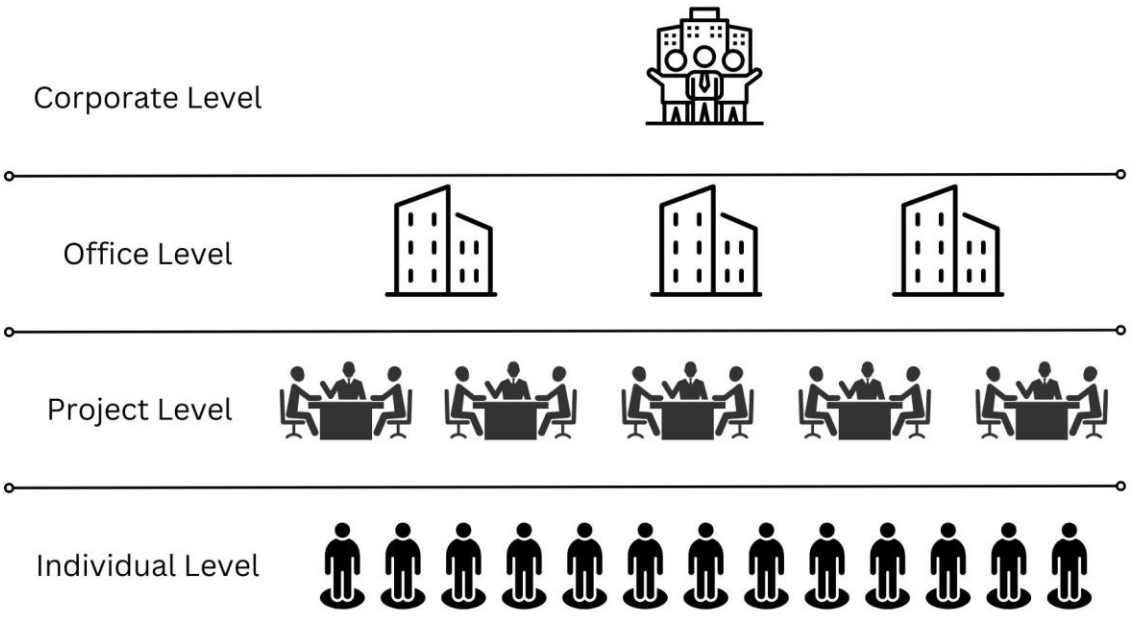


*Figure 3- Levels of operation in EPC firms*

The reason behind this breakdown was to develop a way of working oriented toward each level utilizing the IPAR framework specified for each level of operation. IPAR is an acronym outlining four phases pertinent to the successful implementation of cultural awareness between project team members. These phases consisted of identifying cultural differences; planning cultural awareness sessions; applying the plan; and reflecting on the results. The IPAR framework was intended to be used consistently over the duration of an EPC project.

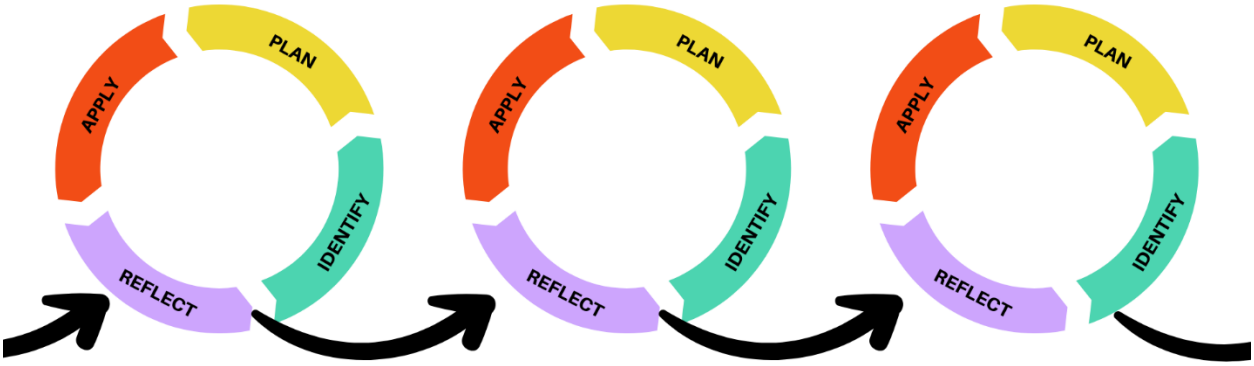


*Figure 4- IPAR framework over time.*

A recommended way of working was established for each phase based on the operation level, establishing a recommendation for best practices to be applied based on the results of phases one and two of the thesis.

The basis of design for incorporating cultural awareness throughout EPC projects involved continuous revision and integration of cultural understanding across all project phases. A framework was developed to guide project team leaders in implementing cultural awareness effectively.

The framework operates at various levels of operation within EPC firms. The corporate level emphasizes global training sessions, while the office level plans quarterly activities targeting specific cultural layers. The project level integrates cultural awareness into monthly progress reports, ensuring active participation and accountability take place. At the individual level, yearly goals and performance appraisals promote personal growth through cultural awareness activities.

The framework has been evaluated by experts in people and culture, where the implementation of the framework aligns with the firm's overall strategy. Overall, the IPAR framework facilitates continuous cultural awareness integration to harness cultural diversity and improve cross-cultural collaboration by setting out an agile system of planning and reviewing over specified cycles depending on the level of operation.

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# Acknowledgments

I would like to express my sincere gratitude to my esteemed supervisors, Prof. Dr. Hans Bakker, Dr. Ir. Marian Bosch-Rekveldt, and Dr. Ir. Maedeh Molaei for their invaluable support and guidance throughout the duration of my graduation. Their dedication, commitment, and encouragement paved the path to the completion of my thesis. I am deeply grateful for their knowledge and assistance, without which the results of my research would not have been achieved. I gradually evolved through every progress meeting, initiating a struggling effort to consistently improve through every progress meeting.

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I am deeply indebted to all the individuals at Fluor who contributed to the research results. I extend my sincere gratitude to the people who participated in the interviews and answered all my questions, for their interest in my work and their generosity in giving their time and insights.

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# Abbreviations

*Table 1- Acronym list.*

| *Acronym* | Definition |
|---|---|
| *EPC* | Engineering, Procurement, and Construction |
| *Ch* | Chapter |
| *SQ* | Sub-Question |
| *IPAR* | Identify, Plan, Apply, and Reflect |

# 1. Introduction

## 1.1 Context

For a large portion of academic history, the management of construction projects was confined to the discipline of engineering (Van Marrewijk, 2018). The traditional route to becoming a project manager often initiated from being a discipline engineer, evolving into a team lead, then transitioning into project management. The purpose of this process was to ensure the technical competency of the project manager (Mackay, 2021). A growing need for a comprehensive understanding of social interaction arose in the industry (Lin & Huang, 2010).

The traditional "Iron Triangle", a popular representation of the three constraints that affect a project: time, cost, and quality, is not the only metric contributing to a project's performance (Caccamese & Bragantini, 2012). In addition to the "Iron Triangle", there are more dimensions involved resulting in a "soft pyramid", a concept of multiple concurrent constraints including the internal satisfaction of the individuals working on the project as well (Caccamese & Bragantini, 2012).

Consequently, the focus of establishing a successful project has evolved to include motivation, social, and holistic dimensions that were not simple to assess and address (Caccamese & Bragantini, 2012). In other words, the understanding of the interaction between project team members has become a crucial element to explore in projects to improve the quality of work executed (Lin & Huang, 2010). Figure 5 below displays the transition from a flat outlook to a more complex and multi-dimensional platform.

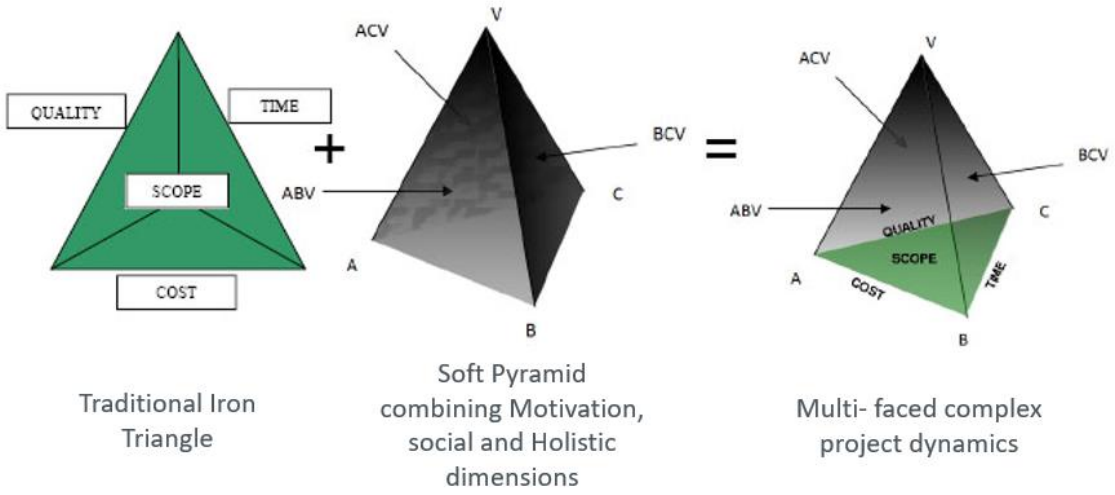


*Figure 5- The soft pyramid retrieved from (Caccamese & Bragantini,2012).*

## 1.2 Problem description

The Engineering, Procurement, and Construction (EPC) Industry is a complex and dynamic sector that involves a high level of collaboration among multiple stakeholders (Van Ban et al, 2017). EPC firms monetize the geographical distribution of employees to reduce costs and expand resource availability (Blanco et al, 2019).

Therefore, collaboration is critical for the success of EPC projects as it enables the integration of diverse skills and expertise (Ankarah, 2007). The larger the project, the more interfaces are involved in project delivery which increases project complexity (Jing & Ling, 2005).

Although the interaction among people and multinational organizations from different cultures is one of the most complex issues evident in large construction projects, there is limited cross-cultural research in the context of the construction industry (Ofori & Toor, 2009).

In that regard, this thesis focused on awareness of culture in projects is needed to optimize value in collaborative efforts, and result in better performance (Blanco et al, 2019). A gap has been identified in the relationship between culture and collaboration (Suprapto, 2016).

## 1.3 Research objective

The objective is to provide EPC firms with findings and insights on how cultural awareness can be implemented in future EPC projects. Moreover, investigate how cultural elements may influence project execution, and develop recommendations to support future EPC projects.

## 1.4 Scope and company partner

This research is oriented toward the EPC industry, combining existing literature with empirical research to understand the elements involved in cultural considerations.

For this thesis, Fluor Corporation is used to elaborate on the objective of this thesis. Fluor is a global engineering, procurement, construction, and maintenance company that has been involved in various large-scale EPC projects around the world (Fluor Corporation, 2022).

The company's experience and expertise in managing complex projects involving multiple stakeholders and cultural backgrounds make it an ideal partner for researching how cultural awareness can improve collaboration in future EPC projects.

Fluor's origins can be traced back to its initial establishment in the United States, but it grew into a global EPC contractor (Fluor Corporation, 2022). The research is limited to data retrieved from Energy Solutions projects executed by Fluor's European Headquarters situated near Amsterdam in The Netherlands. The reason for this is to reduce the variable involved with working in different

business lines. When referring to a project team, this involves the client team and the main contractors' team. While noting this, data is only collected from Fluor team members.

## 1.5 Research questions

EPC firms often involve culturally diverse teams from different countries, backgrounds, and education working concurrently, which often creates communication and collaboration challenges (Blanco et al, 2019). The main purpose of this thesis is to consider how awareness of cultural elements should be implemented in future EPC projects and propose pragmatic recommendations to enhance project execution.

To facilitate this endeavor, the main research question is broken down into four sub-questions dedicated to exploring and understanding how cultural awareness could affect collaboration in future EPC projects. The breakdown is illustrated in Figure 6 below.

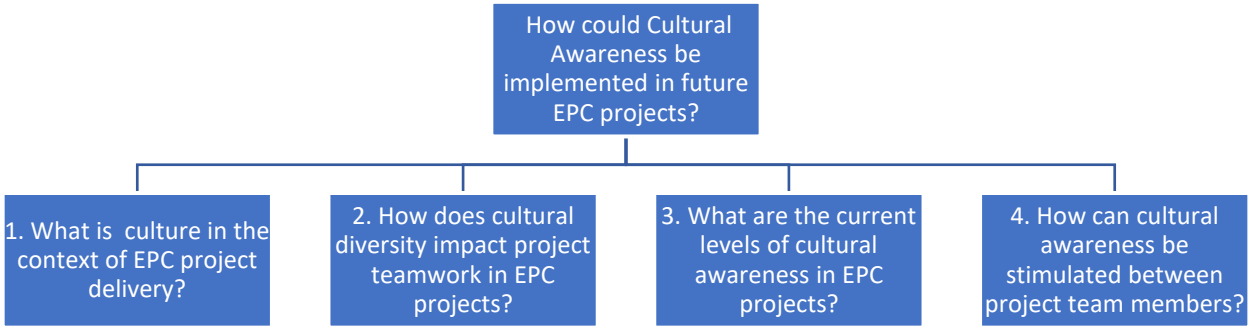


*Figure 6- Main research question and supporting sub-questions.*

To facilitate the breakdown of the main research question and the role of each sub-question, this section was created. Under each sub-question, an explanation is transcribed to its role and importance in this thesis.

### 1.5.1 What is culture in the context of EPC project delivery?

The first sub-question is developed to provide a fundamental understanding of cultural differences that impact teamwork in EPC projects. By examining how culture is defined and which elements are represented in EPC projects, a basis for the research will be derived. Chapter 3 is oriented

towards solving this sub-question by exploring existing literature and theories about culture in the context of EPC project delivery.

### 1.5.2 How does cultural diversity impact project teams?

The second sub-question is focused on understanding the relationship between cultural diversity in the project team. Cultural diversity in this case refers to cultural similarities and differences between the project team members, and how it relates to the project execution. Culture and cultural diversity are very broad topics that are touched upon in Chapter 3 but addressed in more detail in Chapter 4.

### 1.5.3 What are the current levels of cultural awareness in EPC projects?

The third sub-question provides a baseline for understanding the current state of cultural awareness in EPC projects. This understanding ensures that recommendations to incorporate cultural awareness are pragmatic and more likely to be successful in enhancing teamwork in future EPC projects. Chapter 4 aims to solve this sub-question using interviews to convey the current levels of cultural awareness in EPC projects.

### 1.5.4 How can cultural awareness be stimulated between project team members?

The fourth sub-question focuses on developing a tangible guideline that can be used by an EPC firm to effectively incorporate cultural awareness in EPC projects. This sub-question is a culmination of recommended ways of working based on the findings of the other three sub-questions, this will be answered in Chapter 5. A reading guide is illustrated in Table 2.

*Table 2- Reading Guide*

| Chapter | Context | Sub-Question |
|---|---|---|
| **1** | Introduction | |
| **2** | Research Methodology | |
| **3** | Literature Review | 1 |
| **4** | Interviews | 2,3 |
| **5** | Solution Development | 4 |
| **6** | Discussion | |
| **7** | Conclusions and Recommendations | |

# 2. Research methodology

This thesis is split into three distinct phases to answer the main research question. The first phase focuses on undertaking a literature review to answer the first sub-question oriented toward understanding the role of culture in the EPC industry. The results of Phase One set the theoretical basis of the empirical research.

Phase two is oriented toward understanding the current levels of cultural awareness in EPC projects and the relationship between cultural diversity and project execution. Based on the results of phase one, the basis of the interview and gaps are identified. The interviews are analyzed through a reflexive thematic analysis. The results of phases one and two are combined to formulate the basis for recommendations and gaps to develop a solution.

Phase three combines the review of documents and develops a solution based on the findings of the research, this is further validated through expert evaluation in the form of interviews. Then the fourth sub-question regarding the stimulation of cultural awareness between project team members is addressed. Finally, the conclusions and recommendations are developed. Figure 7 below displays the breakdown of the main phases of this research.

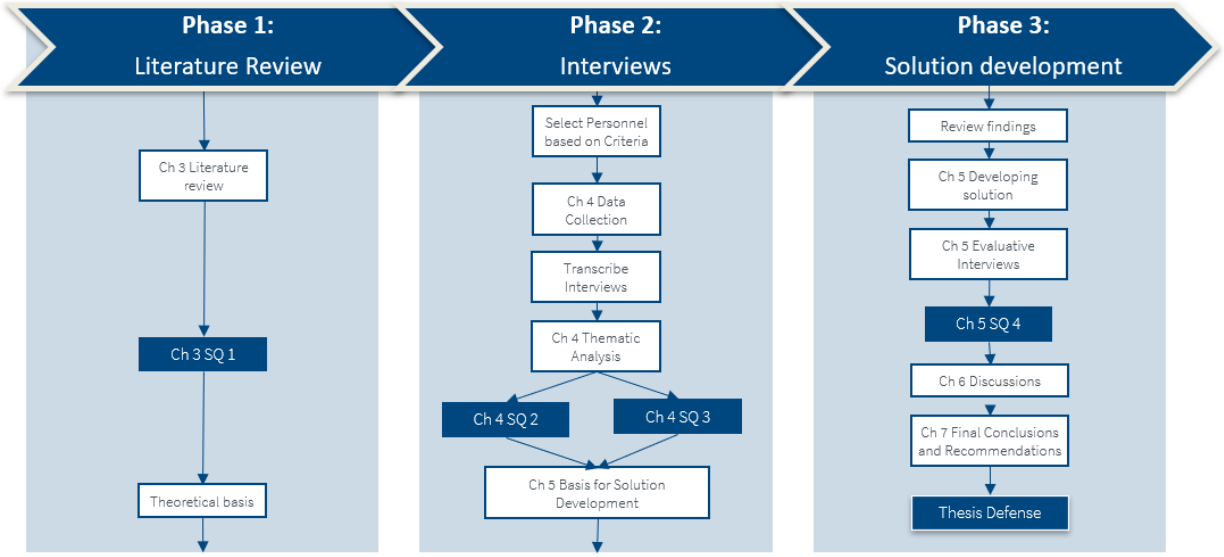


*Figure 7- Breakdown of phases of thesis.*

## 2.1 Literature review

Research is founded upon the insights gained from previous findings and existing knowledge regardless of academic discipline (Snyder, 2019). Therefore, the literature review acts as a starting point for the thesis in understanding the existing research.

To initiate the explorative literature review, a literature search was performed applying keywords and phrases such as 'culture', 'culture in construction', 'culture and performance in construction', 'culture in EPC projects', 'culture and collaboration in projects, "trust in construction' and 'intercultural relations.

A selection of articles was identified, and a summary of the key findings of these articles is available in **Appendix A-1**. Based on the findings, a snowball effect was implemented by navigating through similar articles and books to deepen the scope of the literature review. Figure 8 illustrates the literature review procedure driving the theoretical basis of this research.




*Figure 8- Literature review procedure.*

## 2.2 Interviews

The interviews were undertaken to understand the current levels of cultural awareness in EPC projects and the relationship between cultural diversity and project execution. The chosen method of data collection was interviewed to develop a deeper look into how culture plays a role in projects by supplementing the explorative nature of the research and giving participants the space to expand on their responses, creating opportunities to learn from their experiences.

The procedure of the interviews consisted of: The selection of competent interview participants; developing a protocol for semi-structured interviews; conducting the interviews in-person or online; transcribing the recordings; analyzing the data; and identifying themes and patterns related to the two sub-questions. A visualization for this is displayed in Figure 9 on the next page.

The goal of this phase was to investigate the current level of cultural awareness in an EPC firm and explore the relationship between cultural diversity and project execution in more detail to provide a basis for improving the performance of collaboration in future projects.




*Figure 9- Interview process.*

### 2.2.1 Data collection

Semi-structured interviews were conducted with 21 key personnel occupying managerial positions across five active EPC projects led by Fluor's Amsterdam office. The sample size was based on the availability of participants, and the amount needed to draw meaningful insights.

The selection criteria for this research were that projects require to be in the EPC phase and remain a part of the energy solutions business line to maintain relative consistency of the context to enhance the focus on cultural implications on projects. The Energy Solutions business line was selected because the Amsterdam office predominantly operates in this business line. The interviews incorporated professionals within Fluor who have experience in EPC projects, this was ensured through the selection of managerial positions.

The disciplines selected reflected the three phases of EPC including the disciplines of project management and project controls due to their prominent role in the project lifecycle. In summary, the selected participants included: Project Managers, Construction Managers, Procurement Managers, Project Controls Managers, and Engineering Managers.

Even though the projects were led by Amsterdam's office, because of Fluor's work share strategy, some participants were based in other offices including Farnborough (UK) and New Delhi (India). An overview of the participants and interviews undertaken can be observed in Table 5 in **Chapter 4**.

### 2.2.2 Interview analysis

To optimize the analysis of the interviews, transcripts were developed using Rev.com; an automated AI transcription service that transforms audio files into transcripts. Following the transcription of the interviews, the transcription files were uploaded to Atlas.ti, the qualitative research software selected to assist in coding the transcripts. The main advantage of Atlas.ti was that it enables users to compile all their coding in one database, facilitating the procedure significantly.

The transcripts were coded using the principle of reflexive thematic analysis, this type of analysis is intended for exploring and interpreting a qualitative set of data and forming a narrative about patterns identified in the transcripts (Braun & Clarke, 2006). This made it an ideal method to implement for this research. Reflexive thematic analysis embraces the researcher's subjective skills (Braun & Clarke, 2006). This creates a possibility of personal biases, but to reduce the likelihood of bias a reflection was written after each interview which can be seen in **Appendix B-2**, and links to the literature review were formed.

Before coding, the data was read carefully to gain a deeper understanding of the topics discussed. Interesting quotes were highlighted while reading, transitioning into the initial coding of the transcripts. Following the initial coding, patterns emerged conveying several similar codes, these similar codes were grouped into higher-order themes and combined to reduce the number of recurring codes.

The analysis established a theoretical basis for explorative research through its ability to explore and dive into the nuanced perspectives of the interviewee participants. A six-stage process was utilized for the reflexive thematic analysis, the stages can be seen in Figure 10.

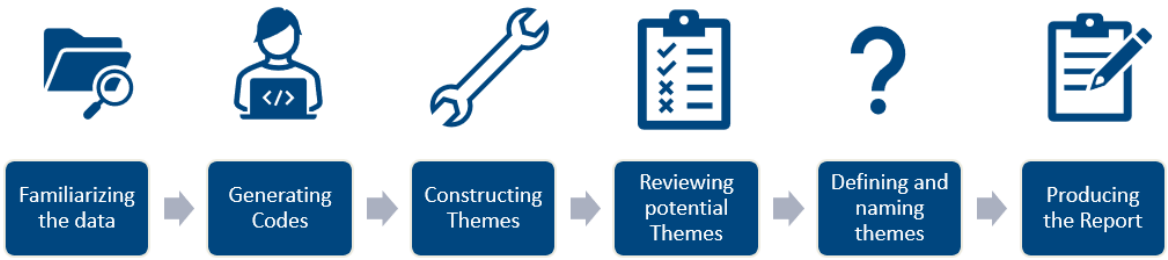


*Figure 10- Reflexive thematic analysis process inspired by (Braun & Clarke, 2006).*

## 2.3 Solution development

The basis of the design and development of the solution framework was guided by combining the results of the literature review and interviews to compare and identify gaps in the current methods of incorporating cultural awareness. The main objective was to develop a guideline intended to facilitate the stimulation of cultural awareness in future EPC projects.

The literature review specialized in conveying an extensive search for existing knowledge, theories, and best practices related to cultural awareness, providing a theoretical foundation for the proposed solution. The interviews gathered current insights, perspectives, and real-world experiences to reflect the dynamics of project execution.

The framework was created by outlining the key requirements conveyed in the interviews and literature, then translating them into practice. The important elements derived were then connected to form a recommended solution addressing the challenges involved with incorporating cultural awareness.

To evaluate the framework, the solution was assessed by experts through detailed interviews assessing the content and applicability of the framework. The step-by-step process of the Solution development is presented in Figure 11.




*Figure 11- Solution development process.*

### 2.3.1 Expert evaluation

This section outlines the interview setup of the validation of the cultural awareness framework. The two metrics used to assess the framework were the quality of content and functionality of the framework in practice. The selection of interview participants was based on finding individuals with the experience and capabilities of generating feedback regarding culture in EPC projects. The people and culture department at Fluor was selected as an expert in the matter due to their role and function in project execution.

There was an imminent desire for individuals who possess the knowledge and competency of culture as well as an active role of overseeing project execution. As a result, three candidates were selected to discuss the solution separately: specifically, the operations lead responsible for the delivery of all projects executed by Fluor Amsterdam; the engineering lead responsible for the delivery of engineering phase deliverables; and a communications specialist with a background in corporate communication for intercultural relations. A summary of the interview participants, along with their department and function is outlined in Table 17 in **Chapter 5.3**.

The interviews were conducted face-to-face to increase the quality of the interview by observing the exchange of physical gestures and sketching ideas to support arguments. The interview initiated with a brief presentation outlining the key points of the cultural awareness framework that was developed.

This ensured that there was a basis for discussion and an overview of the objective of incorporating the framework. After the presentation of the framework, a discussion was undertaken giving the interview participants the freedom and flexibility for any queries expressing their perspective on the cultural awareness framework.

Each interview lasted approximately 45 minutes, the presentation lasted approximately 8 - 10 minutes, and the rest was an open dialogue assessing the framework. Participants were encouraged to use examples or anecdotes to support their discourse, this was primarily suggested to facilitate the discussion, thus minimizing space for misinterpretation.

To ensure the accuracy of feedback, the interviews were recorded live with the participant's consent. To protect the privacy of participants, their names were anonymized by referring to them in Roman numerals as opposed to their names.

The criteria for selecting the participants were ensuring they were part of the people and culture department and had experience working in the EPC industry.

# 3. Literature review

The literature review aims to provide a theoretical basis of existing knowledge related to culture concerning the EPC industry. The existing theory is examined and synthesized through four key themes identified: Project culture; culture and performance; trust; and the connection between culture and identity.

By synthesizing and analyzing relevant research, this review seeks to contribute to a deeper understanding of these topics and identify key factors in understanding culture, specifically in the EPC industry. A reading guide for Chapter 3 is presented in Table 3.

*Table 3- A reading guide for literature review sub-chapters.*

| Sub-chapter | Topic/Theme |
|---|---|
| **3.1** | Project culture |
| **3.2** | Culture and performance |
| **3.3** | Trust |
| **3.4** | Culture and identity |
| **3.5** | Conclusions |

## 3.1 Project culture

Culture in the construction industry often refers to the differences in task environment that impact the nature of decision-making, and the nature of products and services (Low & Winifredo, 2000). The construction industry combines the expertise of a variety of disciplines to collaborate and execute tasks to complete a piece of work or service.

Different disciplines are raised through different schools of thought, and there are cultural differences between different professions involved with construction projects (Liu & Fellows, 1999). This makes culture a crucial component of any construction project.

Culture is a complex concept that has been interpreted and defined differently across different disciplines, resulting in culture being notoriously difficult to define (Spencer-Oatey, 2012), it stems from the complexity and ambiguity associated with it.

Culture is a holistic concept (Hofstede, 2001), argued to consist of many social mechanisms which further connect to the subjective perception of culture. Researchers provide their argument to how culture should be defined, but a unified definition could not be found.

Although culture is difficult to define, patterns emerge through the various studies conducted by researchers that are useful in interpreting the concept. Hofstede perceives culture as the programming of the mind conveying the unwritten rules of society (Hofstede, 2001).

This conveys the nature that culture is learned and that a set of rules is subjectively perceived by groups of people, meaning that it is a social mechanism that evolves with time. This further

develops into culture being both an individual and social construct (Avruch, 1998) creating a paradigm beyond a simple definition.

In addition to this, culture is not value-laden (Spencer-Oatey, 2012), meaning that it is descriptive, and differences cannot be ranked superior to one another, but rather recognized and accepted with equal respect and an open mind.

Schein further suggests that it impacts the conscious mind, and influences the way individuals think, act, and interact to adapt to social mechanisms in society (Schein, 1991), this portrayed the cognitive impact of culture influencing the way people think, act, and interact to adapt to social mechanisms in society. Figure 12 summarizes the variety of elements that are interlinked with culture by researchers.




*Figure 12- Combination of aspects related to culture observed in the literature.*

It is crucial to acknowledge both similarities and differences between cultures and develop cultural awareness, as culture can be seen as the binding force that ties societies together (Hofstede, 2001). Furthermore, culture is not a fixed entity but a dynamic social construct that is continuously negotiated and contested, developing, and evolving (Gupta & Ferguson, 1992). This means that culture, even in projects, changes across the project lifecycle, and cannot be treated as a static feature.

To compare and understand cultural differences, Dr. Geert Hofstede, an organizational anthropologist, published his cultural dimensions model at the end of the 1970s. The dimensions were derived through a decade of research at IBM with more than 50 countries used to gather data for comparison (Hofstede, 2001). These dimensions facilitate the cultural understanding of

different elements that differ between national cultures. The definition of each dimension is illustrated in **Appendix A-2and ,** a representation of the six dimensions is displayed in Figure 13.

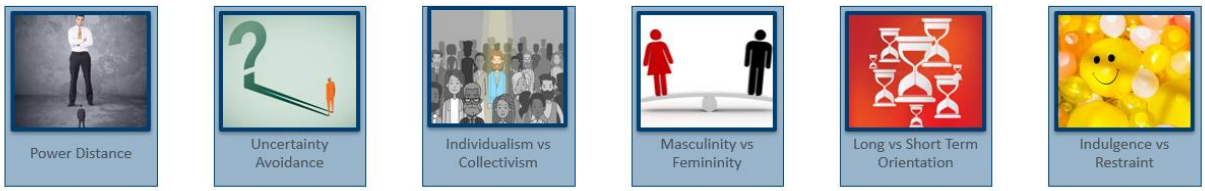


*Figure 13- Six cultural dimensions (Hofstede, 2001).*

Hofstede's model provides useful guidance to recognize cultural dimensions to enable a better understanding of similarities and differences between national culture groups. Projects require cooperation and collaboration among different stakeholders, such as owners, designers, contractors, subcontractors, and suppliers interchanging frequently across the project lifecycle.

There is a vital need for project managers and organizations to reflect on the development of the project culture during the project lifecycle due to the dynamic nature and many interfaces involved (Van Marrewijk, 2007). Since culture influences human interaction, it can influence different stages of the project, from the bid phase until final execution and delivery (Ofori & Toor, 2009).

Furthermore, understanding different layers of culture is important for the success of cross-cultural construction projects (Ofori & Toor, 2009). Project culture may borrow the national characteristics from team members and ways of working (Evaristo & Scudder, 2000), but often project culture overrides the national culture of team members (Zuo & Zilante, 2008). This seeds an argument that levels of culture are also not hierarchical, but equally eligible to influence project dynamics.

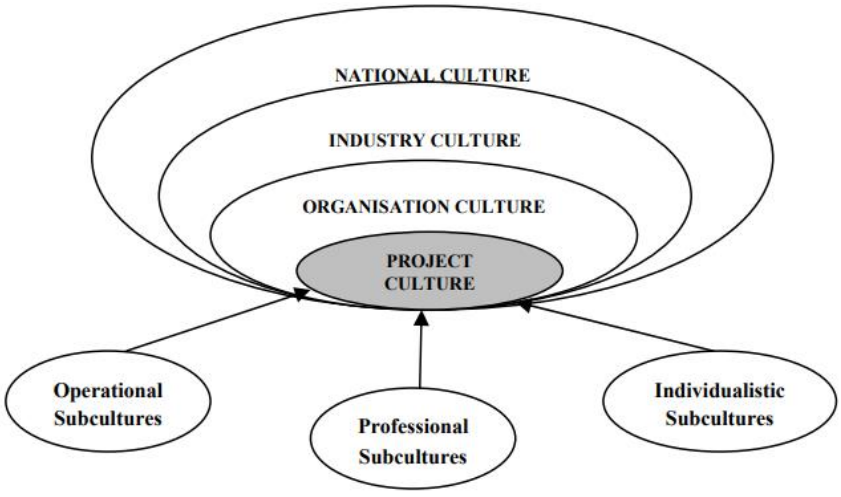


*Figure 14- Levels of culture in projects retrieved from (Samaraweera & Senaratne, 2012).*

Figure 14 above identifies four cultural layers that combine to form the culture within a project: organizational, professional, operational, and individualistic. These layers were discovered to have the largest influence on project culture and are shared by larger groups of people in the project (Samaraweera & Senaratne, 2012). The important takeaway is that culture can be broken down into different layers prominent in a project's culture.

All the layers of culture conveyed in Figure 14 are intertwined (Ankarah, 2007). The relationships convey the connections between different layers of culture, which further relate to the holistic nature of culture. Consequently, it is beneficial to refer to these layers to simplify the scope of the culture that is being discussed.

## 3.2 Culture and performance

An EPC project is a complex transaction involving a set of products, services, and construction works developed to complete an asset for a customer within a finite amount of time such as a building, power plant, weapons system, etc. (Cova & Hoskins, 1997).

This increases the focus and expectations associated with project execution. EPC execution is fast-tracked, typically taking several months to two-three years (Van Ban et al, 2017). This increases the stress and need for effective collaboration between project team members.

EPC projects traditionally include three distinct phases: The engineering phase, the procurement phase, and the construction phase' where EPC firms consolidate the responsibility of all phases (Van Ban et al, 2017).

The phases often overlap to reduce time, further fueling the stressful environment and interaction needed between project team members (Kabiriftar & Mojtahedi, 2019). The adoption of concurrent activities increases the complexity of EPC, increasing the difficulty of managing interfaces due to the fragmentation in project execution (Lee et al, 2006).

The EPC industry has been criticized for its performance in terms of quality, cost, safety, and schedule (Tijhuis & Fellows, 2012). Culture influences the behavior and interactions of a project team, which in turn has implications on project performance (Gray & Larson, 2000).

The culture of the EPC industry at the project level is often associated with negative attributes of collaboration such as: fragmentation, antagonism, mistrust, poor communication, short-term orientation, blame- culture, machismo, and sexism (Ankarah, 2007).

Each element relates to the behavior and attitudes of the people involved in project execution. Humans have basic values which can conflict with one another (Schwartz, 2012), but there needs to be a proactive role in stimulating a culture that can fuel open communication and a safe space creating trust between project team members.

In EPC projects, communication barriers can arise due to cultural differences, leading to misunderstandings, delays, and errors (Ankarah, 2007). Therefore, it is essential to have effective

communication strategies in place to overcome language barriers and ensure successful project outcomes. Multi-cultural teams can bring unique perspectives and ideas, promoting creativity and innovation (Miyamoto et al, 2006). For example, individualistic thinking styles may generate novel ideas, while collectivistic thinking styles may generate useful ideas that fit with existing social concerns.

By embracing cultural differences and promoting effective and open communication, EPC projects can leverage cultural diversity to foster creativity and drive project success.

## 3.3 Trust

Building trust between project team members was mentioned in earlier subsections, a deeper glimpse is undertaken in this subsection. Trust between business partners is crucial for effective collaborations and transactions in international commerce. negotiations (Gelfand & Realo, 1999).

This means that trust and collaboration have a relationship that needs to be acknowledged and understood. Trust is defined as the capacity for vulnerability to the acts of another person based on the belief that the other person would act in a constructive and non-destructive manner (Yamagishi, 2012). Concerning culture, even though values may be shared, they are implemented differently because of cultural mechanisms.

By understanding core values in people and their relationship to one another, a better understanding of the psychological factors that drive people to act in a certain way can be derived (Schwartz, 2012). While trust is frequently dependent on personal skill and dependability in individualistic cultures, it frequently depends on group membership and loyalty in collectivist societies (Hofstede, 2001). Stakeholders are more likely to share information, take calculated risks, and work together to solve issues when there is trust between them (Gelfand & Realo, 1999). Consequently, understanding a project culture could have implications on trust between project team members.

The dilemma of whether emotional experiences are triggered by cultural mechanisms is controversial, there are arguments for universality as well as cross-cultural variability of emotions (Heine, 2010). A key component that relates to how people connect, and form relationships is interpersonal trust.

Interpersonal trust differs dramatically between cultures (Triandis, 2018). A great degree of trust exists among people, even strangers, in some individualistic cultures, this is partly attributable to social structures and expectations that value openness, truthfulness, and justice (Triandis, 2018).

On the other hand, some collectivist cultures frequently base trust on connections and personal relationships, intercultural trust is shaped in part by cultural values and beliefs. While trust is frequently dependent on personal skill and dependability in individualistic cultures, it frequently depends on group membership and loyalty in collectivist societies (Hofstede, 2001).

Moreover, how a culture views risk and uncertainty might have an impact on trust. For instance, risk-averse cultures may have lower levels of trust because people are hesitant to risk their safety with strangers (Gelfand & Realo, 1999). Building and maintaining interpersonal trust is crucial for fostering connections in the political, economic, and social spheres.

Trust between business partners is crucial for effective collaborations and transactions in international commerce negotiations (Gelfand & Realo, 1999). Establishing trust and minimizing misunderstandings and disputes between people from various cultural origins can both be facilitated through cross-cultural communication, shared objectives, and transparency (Khalfan et al, 2007).

Trust-based relationships reduce transaction costs, enhance information exchange, and promote cooperation, ultimately leading to improved project outcomes (Jiang & Zhao, 2021). The key factors in conveying a trustful exchange are open communication and transparency between parties involved in the EPC project (Shen, et al., 2017). Openness refers to the extent that project personnel are comfortable sharing their ideas without suspecting hidden motives or fear of being judged which may discourage them from disclosing information (Tang et al, 2013).

## 3.4 Culture and identity

Culture, or a combination of cultures plays a crucial role in shaping people's identity (Crawford, 2017). Culture sets the fundamental orientation of how individuals view themselves and others and form their own identities (Gupta & Ferguson, 1992). In project environments, individuals involved from diverse backgrounds unite to work towards a common goal.

As a result, team members are exposed to different ways of thinking, communicating, and problem-solving, which can influence their identities. Cultural identities are not static but constantly evolving as individuals navigate different cultural contexts (Kidd & Teagle, 2012).

For example, an engineer from the Netherlands working on a project in Kuwait may experience a shift in his identity as he adapts to the local cultural norms and values. This could also refer to different forms of culture such as working for different organizations, or in a different discipline (Van Marrewijk, 2018).

A technique used to understand how cultural factors impact project execution is neurolinguistic programming (NLP); a psychological methodology that investigates the intricate interplay between language, behavior, and subjective experiences (Einspruch & Forman, 1985). Cultural elements such as language; customs, and norms, play a crucial role in shaping how people interpret and respond to information (Einspruch & Forman, 1985).

NLP conveys the patterns learned through experiences and how they have an impact on behavior, values, and neurological behavior. Figure 15 on the next page illustrates Dilts pyramid outlining the neurological levels, higher order levels assume more similarities between project team members.




*Figure 15- Dilts Pyramid retrieved from (Garenett, 2013)*

## 3.5 Conclusions

Based on the literature review, defining culture proved to be challenging due to the holistic nature of the term, combining a variety of elements forming a complex entity referred to as culture. Academics cannot align on a unique definition, which reflects the ambiguity related to culture, and subjective perspectives associated with it. Culture relates to people's experiences and how it impacts their neurological behavior.

Fundamentally, culture encompasses an array of fields, including the project execution sphere. In project delivery sphere culture represents the, often unspoken, guidelines that are present in a project environment. One way of analyzing culture lay in breaking down the scope into layers to express the smaller grouping of fundamentals shared by groups of people, such as national culture, industry culture, organizational culture, and professional culture. This provides a starting point for understanding the elements of culture that exist in project environments.

Project culture may draw upon certain national attributes exhibited by team members, yet at times, literature claims that project culture supersedes the national culture of the team members involved. In summary, culture amalgamates values, behaviors, and actions within a collective of individuals, ultimately shaping the cognitive processes, conduct, and social interactions of individuals as they adapt to societal mechanisms.

Projects are culturally diverse because of the increasingly varied backgrounds that their team members originate from. Cultural diversity in a project team has the potential to yield a positive impact on project performance by bringing different perspectives, ideas, and solutions to the table.

However, to fully capitalize on the advantages of a culturally diverse project team, and mitigate conflicts based on cultural differences, projects must proactively cultivate an inclusive environment characterized by respect and open communication. The main method for measuring project performance is the application of the iron triangle, and while cultural awareness improves

collaboration, it is often neglected because of the indirect relationship it has with the three parameters of the Iron Triangle.

Although existing literature has explored this subject, the precise relation between cultural diversity and enhanced performance in the EPC industry remains somewhat ambiguous. Consequently, the interview questions should address the literature gap, shedding light on the tangible benefits that cultural diversity can bring to EPC project execution.

Although the literature has provided many interesting insights, it has also raised many questions regarding cultural awareness in EPC projects and how it is applied in practice. The interview stage will form an empirical basis for understanding the current cultural awareness levels in current EPC projects.

# 4. Interview results

The interview stage addresses the analysis of the current levels of cultural awareness and EPC projects and extends the exploration into the relationship between cultural diversity and performance. The section starts by outlining the interview set-up to support the measures undertaken to increase the quality of the interviews undertaken.

Following this, the results and analysis of the interviews are presented in different themes following the qualitative analysis conducted using Atlas.ti. Detailed analysis of the qualitative data culminates in the derivation of meaningful conclusions that bridge theoretical constructs with practical implications. An outline for the sub chapters is illustrated in Table 4.

*Table 4- Chapter 4 reading guide*

| Sub-chapter | Topic/ Theme |
|---|---|
| **4.1** | Interview set-up |
| **4.2** | Results and analysis |
| **4.3** | Conclusions |

## 4.1 Set-up

The interview protocol, illustrated in **Appendix B-1**, included questions related to defining cultural awareness; exploring current procedures related to cultural awareness; industry trends related to intercultural collaboration; and suggestions for improvement based on participants' experience in the industry.

Each interview lasted between 30-60 minutes, depending on the detail of the responses. Interview participants were asked for consent to record and transcript the interviews at the beginning of the interview.

The questions were specifically focused on the project the participant was currently working on to gather relevant data for the study. The interview consisted of 10 questions, excluding sub-questions. The interview format was semi-structured, including pre-planned questions, but provided space for improvisation to explore the research topics further.

The interview stage investigated current levels of cultural awareness in EPC projects from the perspectives of Project Managers, Engineering Managers, Project Controls Managers, Procurement Managers, and Construction Managers from Fluor's Amsterdam office working on EPC projects.

The selection of participants was based on their availability, but projects needed three or more participants to be eligible. The purpose of this was to gain insights from different team members on the same project. This resulted in 21 total interviews with personnel in 5 projects, with approximately 3-5 interviews per project.

To ensure confidentiality, project, and team members' names were omitted from this thesis. In the results and analysis section, projects have a letter from the alphabet representing them, and respondents have a unique number representing them. Table 5 presents a summary of participants with their nationality and interview date.

*Table 5- List of project letters and interview participant data.*

| # | Project | Discipline | Nationality | Date of interview |
|---|---|---|---|---|
| 1 | Project A | Project Manager | Netherlands | 26/04/2023 |
| 2 | | Project Controls | Russia | 4/5/2023 |
| 3 | | Engineering Manager | Netherlands | 4/5/2023 |
| 4 | Project B | Project Manager | Netherlands | 24/04/2023 |
| 5 | | Project Controls | Netherlands | 8/5/2023 |
| 6 | | Engineering Manager | Netherlands | 28/04/2023 |
| 7 | | Procurement Manager | United Kingdom | 3/5/2023 |
| 8 | | Construction Manager | Italy | 4/5/2023 |
| 9 | Project C | Project Manager | Netherlands | 28/04/2023 |
| 10 | | Project Controls | Netherlands | 26/04/2023 |
| 11 | | Engineering Manager | India | 28/04/2023 |
| 12 | | Construction Manager | Netherlands | 26/04/2023 |
| 13 | | Construction Manager | Netherlands | 24/04/2023 |
| 14 | Project D | Project Manager | Netherlands | 24/04/2023 |
| 15 | | Engineering Manager | India | 20/04/2023 |
| 16 | | Procurement Manager | India | 5/5/2023 |
| 17 | Project E | Project Manager | Netherlands | 21/04/2023 |
| 18 | | Project Controls | Iran | 5/5/2023 |

| | | | | |
|---|---|---|---|---|
| 19 | | Engineering Manager | Netherlands | 8/5/2023 |
| 20 | | Construction Manager | Spain | 21/04/2023 |
| 21 | | Procurement Manager | Netherlands | 24/04/2023 |

Furthermore, the interviews were conducted in person or online, depending on the physical location of the interviewees. All interviews were recorded to ensure accuracy and transcribed using AI software: Rev.com with the participants' consent.

Cameras, with participant's consent, were turned on during online interviews to capture facial expressions and non-verbal cues, ensuring the online interviews were as similar as possible to the in-person experience.

To address potential challenges or limitations, interviews were scheduled well in advance, and reminders were sent a day before the scheduled interviews to ensure participants' attendance. In addition, pre-planned examples or recordings of questions were prepared to provide clarity.

To support the quality of interviews, a pilot interview was conducted to test the equipment used (Teams, Camera, and recording device) and the questions before data collection officially commenced.

## 4.2 Results and analysis

The interview results and analysis section dives into a range of critical themes that sprung from the collective patterns identified in the coding of the interviews. The themes are mainly classified into different layers to facilitate analysis. The themes were grouped through a recurring grouping between the codes of the interviews.

Firstly, this section begins by reflecting on the methods identified in the interviews that fostered cultural awareness. Furthermore, the different layers of cultural differences were analyzed in detail; specifically, the nature of a project execution, the significance of organizational culture, the role of national culture, and the dynamics of generational cultural differences. Finally, the influence of cultural diversity on project teams is analyzed. A summary of the themes is presented as a reading guide in Table 6.

*Table 6- Reading guide for results and analysis section.*

| Sub-section | Theme |
|---|---|
| **4.2.1** | Cultural awareness methods |
| **4.2.2** | Project execution |
| **4.2.3** | Organizational culture |
| **4.2.4** | National culture |
| **4.2.5** | Generational culture |
| **4.2.6** | Cultural diversity |

### 4.2.1 Cultural awareness methods

Participants were asked how project culture was formulated, the goal was to foster a conversation around which methods were implemented, and what impressions team members had of them. Participants emphasized that tools were only a step in stimulating a discussion between team members. There was a trend in developing a balance between finding collective traits and respecting individuals' boundaries. This means that tools that emphasize national cultural differences, such as Globe Smart, provide broad assumptions based on most of the population, but it does not necessarily translate to representing every individual identifying with such a nationality.

Project A relied more on working in teams for long periods of time and building relationships through different projects. The traditional team building, and kick-off sessions were developed as participant 1 argued the importance of open communication, and creating a space where team members are comfortable to speak up when problems arise. Furthermore, team outings create a space for informal conversations to take place and bonds to be formed.

Project B's project team comprised of many different nationalities resulting in stimulating a proactive effort to discuss cultural differences, and how to strategize how to work with different cultures. Project B hung the differences in cultural dimensions calculated by Globe Smart in the project team room as a reminder to respect and understand different cultures within a team. Participant 4 felt that visualizing the diversity and tools was successful in ensuring the results were constantly evaluated and discussed.

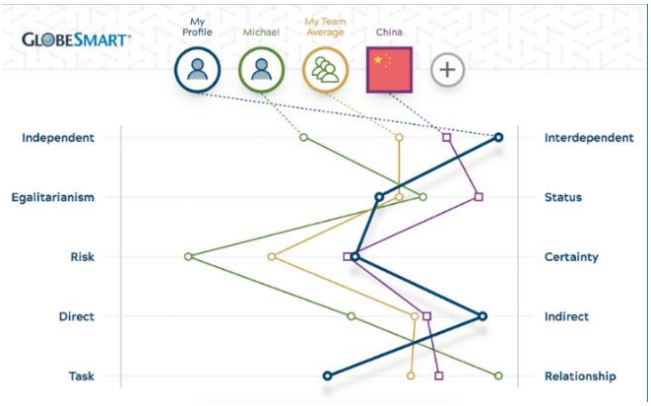


*Figure 16- Globe Smart tool.*

Furthermore, the team members could navigate their positioning on the map relative to others, introducing a sense of self-reflection. The globe smart tool is illustrated above in Figure 16. It must be noted that although the content of the tools was helpful, only the project manager discussed it. The rest of the team did not discuss the globe smart tool when referencing cultural awareness. A display of the position of the tools in the project room of Project B is illustrated on Figure 17.

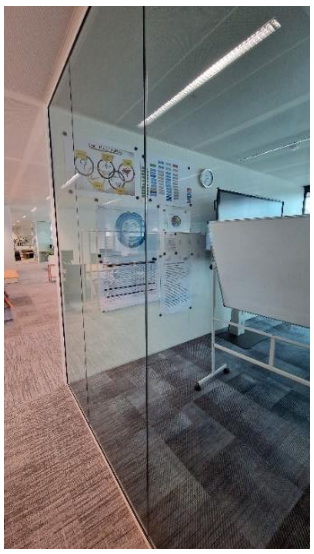

*Figure 17- Disc and Globe Smart in Project B Room*

Another tool applied in Project B was the DISC tool, which is intended to understand the personality types involved in the project. This aided team members in not only understanding the dynamics of the project team by reflecting on their subconscious personality type. Project B also hung a diagram conveying all the positions of team members on the project room wall and it was distributed to the entire project team. This is also visible in Figure 17.

The DISC tool aided the project manager in directing roles dependent on personality types. For example, Participant 4 expressed how people-focused individuals would be better at planning events for the entire team. This tool raised awareness of differences in identities involved in the project team.

Based on the results of the DISC tool in Project B, the project manager was in the Dominant field, while the project manager in Manila was in the steady field. Furthermore, most engineering disciplines were compliant and steady fields, while some were influential fields.

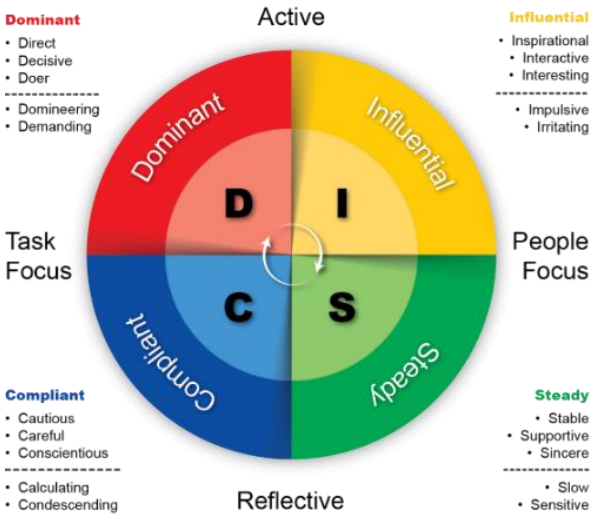


*Figure 18- DISC tool based on (Marston, 1928).*

This resulted in activities and social events being organized by influential people, feedback and raising questions by the steady and competent members, and decision-making by the dominant individuals. Participant 7 also conveyed the self-reflective element of DISC, steering project team members to understand their traits and behavior. An outline of DISC is illustrated in Figure 18.

Project B deploys a survey every quarter to assess the satisfaction of team members, they identified a trend between different offices operated by Fluor. This stimulated the discussion of why this was the case. Did it relate to reflecting the actual conditions of the project? Or the perception of what is considered good, or not good based on percentages.

However, what separates this method from the rest is that it is a repetitive process that has the potential to improve conditions. Furthermore, Participant 5 communicated the desire for a set of tools or tricks which can be used to stimulate cultural awareness, the sort of procedure that the project team members can reference for ideas. As the current capacity of cultural awareness depends on the heuristics

Furthermore, participants from Project C mentioned how social activities such as bowling, or escape rooms stimulated informal interaction which opened the room for vulnerability and discussing cultural differences which created a form of trust between team members. A very interesting cultural awareness method was through cuisine, which almost all participants mentioned experiencing at some point in their careers. This was usually accompanied by a national holiday or celebration which allowed team members to get a glimpse of different culinary dishes. This occurred through events such as the Iranian new year, Ramadan Iftar, or Christmas dinner.

In essence, any endeavor that ensured an informal conversation about values and norms was successful in raising cultural awareness among the team, repeating a key theme that intent is more important than the content of the activity.

While many participants agreed that tools and cultural workshops provided value, it was believed that one-off events were not alone going to lead to successful cultural awareness and collaboration. The integration of cultural awareness in project teams needs to be approached as a process rather than an instance, this reflects the nature of people and the need for consistent improvement and assessment of cultural differences.

Project D hosts the town halls online so everyone can participate and meet face-to-face. Since the project team is fragmented over the globe, team members may at times feel excluded and miss out on the benefits of working in a project team. Participant 15 noted that this was not the case for Project D, because there was a horizontal split in tasks, so team members on similar tasks were in the same location. Furthermore, the use of international visits and technology facilitated the team environment and seeing the faces behind the screens.

Even though some of the methods were technical tools of analysis such as globe smart and DISC, Participant 19 highlighted the importance of authenticity in cultural awareness, highlighting the importance of both parties being genuinely interested in learning about each other's cultural differences. Project E simply invited a new team member every weekly kickoff meeting to play a song they liked on the speaker in the morning before starting the meeting.

Participants felt that this interaction resulted in discussing why the song was chosen, thereby bridging the gap between team members' personal and professional lives. As opposed to globe smart, all project team members recognized the authenticity and intercultural lessons learned through glimpsing into a project team member's reasoning for choosing a song.

Project E also hung the flags of the countries' project team members to represent the national diversity in the project team as well as images of the project team engaging in collaborative work to express unity. This created an atmosphere where project team members felt included in the team and had ownership of their stake in the project. In this case, a simple activity worked out successfully for the specific team, highlighting the importance of adapting to project team members.

The main conclusion is that project teams are different. Therefore, a fit–for–purpose cultural awareness method should be developed. Current effective methods require authenticity and consistent application in the project lifecycle. A summary of all cultural awareness methods mentioned by interviewees is displayed in Table 7.

*Table 7- Summary of cultural awareness methods implemented by project teams.*

| Project | Project | Context |
|---|---|---|
| **A** | Team outings. Working on assignment. | Project A relied on long-term collaboration as a team, and team outings but does not have a proactive approach to cultural awareness. |
| **B** | Globe Smart, DISC, visualizations in the project team room, outings, and surveys. | Project B invested in using a variety of methods resulting in a better understanding of cultural differences. |
| **C** | Team outings, working on assignments abroad | Project C focused on team outings, but also did not have a proactive approach to raising cultural awareness. |
| **D** | Online town halls, international visits | Project D ensures cultural integration by hosting the town halls online so everyone can participate and meet face-to-face. |
| **E** | Music in the morning, and hanging national flags on the wall | Project E relied on authentic practices and informal techniques to discuss cultural differences. |

To support the type of conversations undertaken in the interview, a set of important quotations was extracted and presented in Table 8.

*Table 8- Relevant extracts from the transcripts regarding the importance of cultural awareness*

| Extract | Key takeaway |
|---|---|
| **Topic:** Work on Assignments by Participant 2<br><br>*" it was kind of a great experience, I would say. And it helps to be more flexible**,** and it helps actually to be more flexible, to get adjusted to the environment.*<br><br>*For example, this office is very multicultural, so you have to be cultural, cultural awareness because some people from different nationalities, they have their own tradition, so their own way of behavior and just need to respond correctly to other people, behavior or maybe way of thinking or mentality."* | This extract expresses the benefits associated with working on assignments. |
| **Topic:** Survey results and cultural implications by Participant 4<br><br>*"We survey the entire team in Philippines, Netherlands, UK, and New Delhi.*<br><br>*And what you saw there are huge differences in how people score a survey, for instance. So, the Dutch, we are very, yeah, if something's good, we give it a six out of 10. In the Philippines, if something is good, they scored an eight or a nine in the UK, they're a bit in the middle, they score seven. Interesting.*<br><br>*In the survey, it looked like Amsterdam, that was looking at effectiveness. Amsterdam was scoring very badly. We scored an average of 63% in the uk. Both the client and the funeral office scored an average of 73%. So those two cultures, they scored, that was like in the UK they scored 73 and in Manila, they scored an average of 83%.*<br><br>*So also, there we had a survey now once and we are thinking it should we incorporate some kind of a cultural weighing system because a survey in the Netherlands is different, the scoring is different than how they score in other countries. And therefore**,** if you mix all that maybe gives you the wrong outcome."* | This extract discusses the relation between team effectiveness and the possible cultural influence associated with it. |
| **Topic:** Important if respect and Cultural awareness by Participant 7 | An indication of recognizing the importance of cultural |

| | |
|---|---|
| *"You can't treat everybody with the same brush. And that's the key thing is it's a bit of an urban myth to say that because somebody's from India or from the Philippines or a particular country, they're going to act a certain way. No, they can act differently, and they do. So, you have to be aware that it's not just, you don't fall into that trap and treat everybody the same."* | awareness in project teams. |
| **Topic: Consistent and authentic methods by Participant 19** | |
| "Yeah, what I do, we do have the Monday morning thing. You probably know that every Monday somebody can choose a song or some music, which we played then at start of the nine o'clock meeting. And then there's the opportunity for that person to tell something about why he or she chose this song, which gives an insight a little bit into some somebody's, yeah, private life where he comes from" | A deeper look into the reasoning behind the weekly song choice in Project E |

### 4.2.2 Project execution

To ensure consistency in the quality of project delivery, Fluor follows standard procedures and protocols in project execution. Participant 1 aimed to create a safe project environment where team members feel safe to "Speak up" when conflict arises. This was a shared intent for project culture in Fluor Amsterdam. The main intent behind this was to share workload and help one another complete the task.

This links to the agile management style evolving in Fluor Amsterdam, where problems are prioritized, and transparent communication is a necessity. Furthermore, Participant 14 discussed the implementation of agile collaboration in projects conducted by Fluor requires inputs on when problems arise to ensure they are resolved before compromising the project schedule. This is a shift away from the blame culture, and into how to resolve the problem. Figure 19 presents the basis of agile management involving sprints.




*Figure 19- Agile management process retrieved from (Toggl Team, 2022).*

Many participants recognized differences between offices in that regard, where the Fluor Amsterdam team members found it difficult to recognize whether Fluor Manila was on track or needed support because they were not accustomed to the agile style of project execution.

Participant 5 organized regular meetings to try and identify if problems arose in the Manila office. This was a tedious task, but it was due to the lack of trust in members in Manila when they said the work would be done on time. Differences between the office's project execution related to remnants of their national culture, where it was assumed that perhaps the power distance in Manila discouraged team members from admitting that they were in trouble.

Furthermore, the Amsterdam office has only recently begun engaging with Manila, in the past the Fluor USA engaged in more work-share projects with Manila, where the US work-share execution revolved around ordering specific task, and Manila's role was simply executing them.

On the other hand, Fluor Amsterdam was more interested in allocating functional requirements and supporting Manila to complete tasks how they see fit, expecting Fluor Manila to execute work with a greater degree of autonomy than in the past. So, this was a shift from the traditional role Manila played in projects where the lead office in Amsterdam expected different ways of working in comparison to previous projects from the US.

Participants stressed the importance of transparency and open communication in projects. However, participant 14 argued that transparency and open communication for one culture is very different from what it is for another. Many argued that these mechanisms ensure success, even being transparent with the client/ project owner.

Participant 6 shared an example of the past involving strategic behavior in the Middle East which resulted in deteriorating the relationship between the product owner and Fluor. Later, Fluor engaged with the project owner again with a new team due to the "unforgiving" nature of the product owner. However, this time everything was transparent and conducted openly with the client being able to attend any meetings, this drastically improved the relationship between Fluor and the client.

The aim of implementing an open and transparent project environment is to develop trust between members of the project team, which many participants argued is crucial to a project team environment. Participant 6 also highlighted the importance of relationships over contract type, as the contract is traditionally only brought up when problems arise.

A major factor in EPC is the global workshare conducted by Fluor. Participant 5 argued the main advantage of workshare is cost-related and to shift to expertise that is only available in a particular region. Participant 5 suggested that this type of project execution was successful in engineering disciplines by "working around the clock" in projects and ensuring resource capacity is fulfilled. However, disciplines such as project controls and management had few overlapping times where meetings could take place, creating negative symptoms of global workshare.

Interviews conveyed that one of the main challenges associated with global workshare is the daily face-to-face interactions that have transferred to online meetings. Many participants who worked

with counterparts in different locations found it difficult to engage in informal interactions since usually the meetings were held online.

Participant 7 mentioned that international visits facilitated the generation of relationships between offices. However, there was a generational shift which will be discussed later in terms of needing physical project teams as opposed to virtual teams. Furthermore, a key challenge in engaging through a collaborative environment is the time difference between offices. Many participants expressed this difficulty in having small time windows to call their counterparts in New Delhi or Manila. In other words, limited available time and the online nature of interactions made building a cohesive culture much more challenging.

Different phases of project execution involve different stakeholders, formulating different types of sub-cultures. Construction managers agreed that the construction phase tends to accumulate larger levels of pressure and stress which transform the project's culture. Another key point was that during construction, Participant 20 observed that during construction the size of the workforce becomes larger and more diverse in terms of nationalities, companies, education levels. In essence, different phases value different metrics; construction values time, and engineering value quality which can conflict at times.

In other words, the variance in the technical or professional cultures was less during engineering. Whereas construction involves a different dynamic and levels of understanding of the project execution, this means that communication style needs to be tailored to the audience, requiring a sense of cultural awareness.

Participant 12 emphasized that the key to conducting a successful project is respecting the people involved, especially nowadays when the site includes a variety of different people. This was supported by Participant 13 when mentioning that in subcontractor meetings in Project C, it was difficult to integrate international team members because all the discussions were conducted in Dutch. Later, that team member would end-up leaving due to the language barrier, even though all team members were competent in speaking English. This reflected an exclusive project culture, that was not the management style Fluor desires.

Participant 15 expressed the same concern about Project D for not understanding German in some meetings. This created a gap in utility as the project team needed to understand the contents of the meeting, but the local culture of the construction phase makes it more difficult. Participant 15 argued that client meetings held in Germany are difficult to be involved in online due to the language barrier and that a tool that translates the dialogue would facilitate this process.

Lastly, through the interviews undertaken, a disparity between disciplines was also identified. As a result of interviewing different team members, a glimpse into inter-disciplinary interaction was found. Participant 18 complained that some engineering disciplines tended to be condescending to non-technical disciplines in Project E, meaning that Participant 18 felt a lack of respect for their competency in project execution.

This ties back to the professional subcultures identified in the literature review. This highlights that there is low cultural awareness which leads to a lack of intercultural understanding or

acceptance between professionals. Some extracts from the interview transcripts are displayed in Table 9.

*Table 9- Some extracts related to project execution in Fluor.*

| Quotation | Reference |
|---|---|
| **Topic:** Language barrier on-site by Participant 13.<br><br>*"She is an Indian lady, young, very, very knowledgeable, very, very qualified. And for her, it's not always easy to go into discussions with her Dutch counterparts from contractors. I get the impression."* | The difficulty of cultural integration on site is due to the predominance of the Dutch workforce. |
| **Topic:** culture created in project space by Participant 2.<br><br>*"So that's what I think if you want to have cultural awareness, you need to be in a building together. I think they're still valuing an office to go one place and meet each other in person, not for productivity.*<br><br>*And you could be productive without that. But we just discussed how your environment creates your personality. Exactly. And a culture, they need to go to the same location to shape that. Yeah."* | This extract dives deeply into how the participant defines culture and what elements such as your environment shapes a culture. |
| **Topic:** Seperation between disciplines and formation of disciplinary cultures by Participant 18.<br><br>*"For instance, one of the things I notice, and somehow it's a little bothering for me, is that there's a difference, different attitude between engineering disciplines about non-engineering disciplines, especially for instance, project controls.*<br><br>*So I see some disciplines, they don't have much respect enough respect, regard the engineer and non-engineering disciplines."* | This extract is an intimate dialogue expressing how disciplines sometimes clash in their role when everyone is crucial to a successful project delivery. |

| | |
|---|---|
| **Topic:** How project dynamics and working together gradually needs cultural awareness by Participant 16.<br><br>*"When you are working on a project for a longer duration, you tend to break, connect and have an understanding, common understanding with the people.*<br><br>*These town halls and the team- buildings definitely do help it, but I think it's more or less individual to individual how they work**,** and they accept different people here and the cultures."* | This extract emphasizes that working on projects requires a fundamental understanding with working with others. |
| **Topic:** Involvement of open communication and speaking up when problems arise by Participant 20.<br><br>*"The management is telling you directly. What do you think about that? So**,** they are giving you a space to express yourself, not only for the leaders. For the discipline leaders. In my case, I am the only one in construction and I think both, no.*<br><br>*So**,** because here in the construction during the office phase, our role here in construction is supporting the engineering disciplines. Our main office not here.*<br><br>*But yeah, the management is encouraging everybody, not only the leaders to speak and feel free about what they think about the project and how they can contribute to the project."* | This extract is expressive in expressing the project culture and how all disciplines have the space to speak up. |

### 4.2.3 Organizational culture

As a result of standardized procedures and project execution, Fluor has a relatively strong organizational culture. Participant 1 stated their belief that organizational culture often surpasses other layers of culture due to the nature of project execution and dependence on technical competency. Furthermore, this was supported by Participant 5's declaration that it would be easier

to integrate a Fluor piping engineer from Manila than to integrate a Dutch individual from a different firm due to their understanding of Fluor practices.

This statement was further supported when many participants outlined the nature of cultural differences between Fluor and other organizations. Participant 1 mentioned that Fluor tends to have a collective outlook in project execution, whereas their client was more individualistic. In essence, their client's personnel were more oriented towards individual recognition and promotion, rather than the collective success of the project team. This created an internal competitive dynamic for the client team.

Another key discussion point was the thin line between stereotyping and embracing individuality. Most team members expressed that Fluor consists of many disciplines and nationalities. Then the discussion of cultural similarities took a turn, Participant 16 argued that the idea that everyone from one culture will get along and that two people from completely different backgrounds cannot is considered a bit simplistic.

It was interesting to notice that project team members had pride working in at Fluor. There was a shared recognition that representing Fluor meant something, participants constantly used words such as "we" or "us" when referring to their ownership of Fluor as an organization. Participant 14 related this to the pride one would have in their favorite football team, with collective happiness when the organization succeeds, where the organization's success is also every team member's success.

Participant 14 also pointed out that attributing one's identity to the organization improves performance because it attributes team members to a high standard of project execution to live up to thus reflecting "ownership" of the workplace, this is vitally important, and it manifests pride in collective ownership of the workplace.

Some extracts from the interview transcripts are presented on the next page in Table 10.

*Table 10- Some extracts from the interviews regarding organizational culture.*

| Quotation | Reference |
|---|---|
| **Topic:** Pride of an organization identity by Participant 17.<br><br>*"That little bit of pride is in there, but also a little bit of identity**,** I think. And yeah, it is important that we realize people's identity and the environment in which we work now, it is a lot more clinical on the work Fluor."* | Culture is often described as the shared values between individuals, this sums up the existence of an organization's culture. |
| **Topic:** Organizational culture superseding national culture by Participant 9. | Experience highlighting that organizational differences cause more tension than national differences. |

| | |
|---|---|
| *"Yeah. Yeah. But I think that in general, in the past years, over the past years, I see that company culture clashes are more dominant above cultural intercultural clashes between different nationalities, et cetera.,"* | |
| **Topic:** Ease of integrating team members from different offices into a project by Participant 5.<br><br>*"'What I also think, but please, maybe you see something else coming fresh from university, a person from Manila can content-wise start here tomorrow and be effective over here. A piping person from Manila can hear tomorrow continue in piping Amsterdam.*<br><br>*Okay. Because the Fluor culture or the way we talk with each other is often already, And of course we cannot ignore the national culture, but a fluent language is more important in that way than a local language. "* | This is an intimate dialogue on the ease of integrating an employee from a different nationality due to the corporate culture, as opposed to the same national culture. |

### 4.2.4 National culture

Almost all participants referred to national identity in one way or another when discussing culture. Whether having a large influence or not, participants mentioned differences in national culture and even at regional levels in some cases.

Fluor's organizational culture was discussed as often being the prominent layer of culture in project execution, yet there were differences in how project personnel operated at different office locations. For example, Project team members are aligned in recognizing the hierarchical practice in the Manila office in comparison with others, and it is difficult to get people to admit or "Speak up" when problems arise.

As a great example of the difference in office culture, Participant 1 from the Amsterdam office visited the Manila office and chose to sit at the right end of a table. The team members in Manila found it surprising because the positioning of the desk symbolized the hierarchical position of an employee, where the right side was for the associates/ interns, and the left was incrementally higher in position. And the way it worked was if a problem arose, it followed the same pattern, moving up the value cycle. Figure 20 on the next page visualizes this seating arrangement developing a hierarchical information flow,

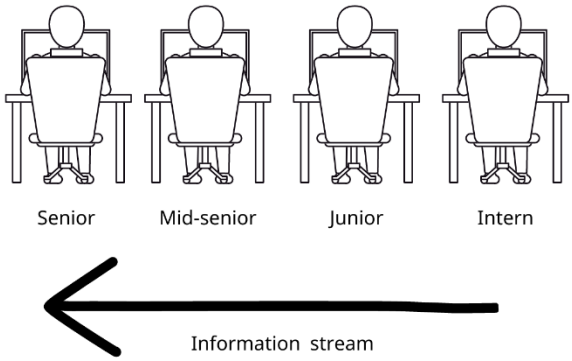


*Figure 20- Desk seating in Fluor Manila.*

This was an interesting visualization of how power distance was implemented, whereas the Dutch office, with a much lower power distance index, follows a flexible workplace and the establishment of network governance in the workplace. The decisionmaker still exists, but in the Dutch office, everyone is expected to voice their opinion.

Concerning national stereotypes, the Dutch tend to get the stereotype of being "direct" or "blunt". While some participants such as Participant 3 disliked the stereotype claiming that being direct isn't related to his national culture, but to his emotions on a given day. On the other hand, it provided some guidance for international colleagues. Perhaps the best example is the ability to comprehend the agenda of meetings.

Participants 6 & 8 complained that sometimes British counterparts would use "fancy" language and it was often confusing what the action point or agreement was. Whereas the Dutch team members utilized "simple" language which provided value to the multinational project team. Many participants who were not brought up in the Netherlands, expressed their realization of direct behavior when working with their Dutch counterparts, as conveyed in Table 11.

*Table 11- Key topics and the number of interview participants associated with them.*

| Topics | Participants |
|---|---|
| Hierarchy in the Manila office | 10/21 |
| Dutch and Direct behavior | 16/21 |

Another communication mismatch was on project E with Scandinavian counterparts, where during meetings the Scandinavian team members were not as engaged as Fluor team members would expect. Participant 19 mentioned that this puzzled them at first, it almost worried them. But in a discussion with other colleagues, it was mentioned that this was normal when engaging in business with Scandinavians.

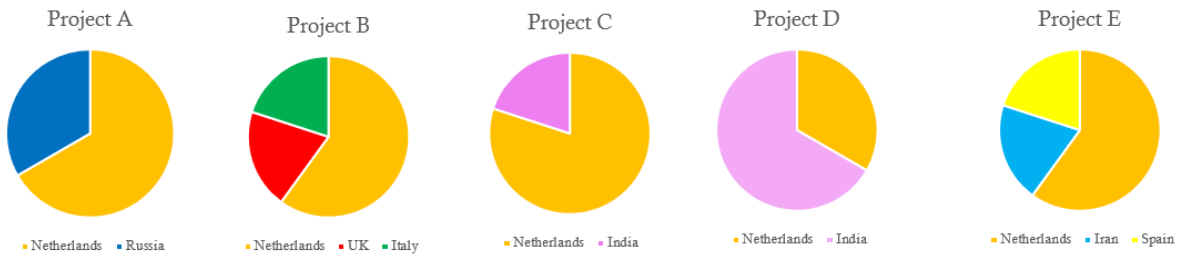


*Figure 21-Distribution of nationalities of interview participants per project team.*

The next point to make is the awareness of national cultural standards when interacting with different nationalities since this is important in constituting respect between project team members. Figure 21 above conveys the distribution of nationalities between project team members who were interviewed. An example of cultural difference was found when Participant 17 mentioned that it was disrespectful to "obtain a business card from a person from Japan without expressing interest by reading the card", arguing the importance of cultural awareness when working with different nations.

Furthermore, this also requires consideration in planning events, by reflecting and ensuring events are fit for purpose. Participant 8 expressed how Italians and French recognized the importance of a fancy dinner as it symbolizes effort. Whereas, the participant noticed after a dinner, that the British counterparts would have preferred a "Beer" in a local bar as opposed to a fancy dinner. Better cultural understanding establishes a basis for successfully organizing social activities or other project-related events.

Participant 8 also mentioned how his cultural dimensions drifted from his traditional national culture. He realized this through discussions with previous colleagues he used to work with, who noticed an evolutionary change in his behavior and values since abroad. This supports the theory of how culture is a dynamic evolutionary concept that changes with time and cannot be applied to all individuals from the same nation.

Learning from different national cultures was seen as a positive endeavor by participants in the interview. Participant 2 mentioned how different projects altered her behavior over time. Specifically, she mentioned how northern Europe shared some of her traits in terms of work culture, but working in Spain presented cultural differences, teaching her new approaches to project execution. Specifically, the nature of calmness during chaotic situations where there is less urgency when completing tasks in Spain when compared to northern Europe.

Furthermore, participants who had relocated to the Netherlands for their job mentioned how the Dutch work culture ensures a work-life balance by ensuring boundaries outside working hours, defining a key boundary between working and private life. This taught them the importance of recreational life and ensuring a fair balance is achieved.

Some extracts from the interview transcripts are illustrated in Table 12.

*Table 12- Extracts from interview transcripts related to national culture.*

| Quotation | Context |
|---|---|
| **Topic:** Similarities between national cultures help navigate awareness by Participant 4<br><br>"Sometimes we ask the Philippines to clarify cultural differences with our Japanese counterparts." | This translates the perception of how national cultures may seem foreign to some and require navigation to comprehend. |
| **Topic:** Hierarchical culture in the Philippines in comparison to the Netherlands network culture by Participant 10.<br><br>*"I think if you look at the average employee in Philippines and Amsterdam, is that in Amsterdam, the style communication style is a bit more direct where we ourselves, yeah, speak up to our lead or anyone in the office in case we see, see a potential issue. And there we expect that everybody, we expect that others would act in the same way.*<br><br>*where we know that the average in Manila, the system is a bit more hierarchical, where an engineer who sees an issue might not speak up, or he says, okay, but my job was to do it this way, even though I see that it might be better another way, or there can be an issue here, but then chooses not to speak up because that's not in their culture, that's not common"* | This extract shares insights shared by many interviewees regarding the impact of national identity on project execution |
| **Topic:** The importance of recognizing national differences, but not coercing them on people Participant 3.<br><br>*"I think the differences between people are much broader than the differences between national, between nationalities or genders or whatnot. So yeah, it does make sense to know a little bit about when you go to India about* | This extract shares an intimate frustration with being held to national cultural stereotypes and leaving space for individual traits. |

| | |
|---|---|
| *what's going on, but not old people from India are the same. And not all Dutchies are the same. That's correct.*<br><br>*So, I don't like that people always come to me and say, oh your Dutch, you must be expressive or blunt. Yeah, I understand. I don't feel that way. Yeah. And then when you go to Globe Smart or whatever, you read the same kind of stereotype standard stuff about people from Iran or people from India or wherever.*<br><br>*Yeah, I, so I did a couple of them nationalities and also compare, you can compare them to your disc evaluation to see where you sit and where other people sit and what potential pitfalls or whatnot can be. But I mean, I'm also different every day. So sometimes I am blunt, and they say, you're a typical Dutch. And I'm like, yeah, but this is me today and tomorrow I'm different."* | |

### 4.2.5 Generational culture

A large array of age groups is involved in EPC project delivery. With years of experience being an important reflection of the technical competency of team members, the theme of generational culture was noticeable.

An example of a generational gap was the positioning of a relatively young engineer in a senior role in Project D. At first glance, some older discipline leads questioned the decision to do so. Even though the individual was competent in their role. Later, the decision proved to be the right one, but the hesitation of acceptance reflected a cultural conflict in the work environment, and dependence on years to reflect competency in roles.

Another key element of generational culture is the sensitivity to cultural generalizations. Participant 17 mentioned the evolving cancel culture and soft culture generates a barrier to a true understanding of cultural differences because it is difficult to discuss sensitive topics for fear of being labeled as offensive. Participant 17 expressed that to learn something new, one must risk offense, but nowadays the soft culture makes it difficult to extend a layer of vulnerability needed in forming relationships.

Participant 19 further recommended that the best way to handle situations is approaching them with a curious attitude rather than a cautious one. In other words, participants viewed the workplace as a safe space where open discussions without filters can take place. Some lines should not be crossed, but there is a difference between intentionally offending and unconsciously doing so. One can deduce that it is better to raise cultural awareness early in the project to avoid discomfort and misinterpretations of intent.

A major contribution to the generational disarray was the integration of a virtual workplace. Many participants complained about the lack of intimacy and engagement traditionally related to face-to-face project execution. There was a longing for the project environment in the office, especially for the engineering phase, whereas many changes in terms of hybrid work and global workshare altered this dynamic. Also in procurement activities, participant 7 felt they needed the physical presence to have effective collaboration. It was recommended to bring team members from abroad on assignment when working on projects by Participant 7. Many participants felt this was less productive because it was different that the traditional way of working, relating to the generational gap and change in the workspace.

Some extracts from the interview transcripts related to topics about generational culture are presented in Table 13.

*Table 13- Extracts from interview transcripts related to generational culture.*

| Quotation | Reference |
|---|---|
| **Topic:** Highlighting that younger colleague needed cultural awareness in Project B by Participant 4.<br><br>*"The young people maybe not so much. So, for them to, we had that picture that would show them the big differences between us and the UK, but also with us and Japan and then Japan and Manila, Philippines."* | This extract is short but highlights the perception that younger team members require more effort in cultural awareness. |
| **Topic:** Softening of work culture in construction by Participant 12.<br><br>"In the old days, with the whole team, Dutch people, yeah, sometimes the Latin language and things like that were a bit rougher than these days. " | This extract conveys the idea that for some reason nowadays the culture is softer than in the past. |
| **Topic:** Seniority by a younger colleague in Project D by Participant 14.<br><br>*"There were leads and there were in the Netherlands and in Germany, leads of over 60 years of age reporting to a* | This extract conveys the stereotypes associated with being young and lacking experience, which ended up being false. |

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|---|---|
| *woman of about 35 years of age. So, there you also have, but I deliberately said, no, I'm going to do that.*<br><br>*I even had one of these leads come to me say, are you sure you want to give this young inexperienced woman in India the chance and to do this? Do you think she's up for the task? I wonder, said, I think she's okay if you think I will give it a shot. And ultimately after half a year, he came back to me, said like, ah, yeah, no, I really underestimated her."* | |
| **Topic:** Lack of experience requires more cultural awareness by Participant 21.<br><br>*"So, I think that it is very recommendable, certainly for younger people, younger generations, because I'm an old man of course, that we all know. But yeah, I think there is a lot to be learned by, learned by the different cultures."* | This extract highlighted a common perception that younger people needed to learn cultural awareness due to their lack of experience in the industry. |
| **Topic**: the perception that younger employees are easier to teach than older colleagues by Participant 18.<br><br>*"We can teach people some aspects that they are not aware of that. But somehow also, you cannot change some things about some people because it's their personality. And when they are in the course their forties or 45 or fifties, some aspects cannot be changed."* | This extract highlights the perception that some inertia exists with older individuals making it harder to communicate differences. |

### 4.2.6 Cultural diversity

The project teams for the surveyed projects were consistently diverse. A common agreement among many participants regardless of the project was that cultural diversity helps in decision-making a collaborative effort. Participant 14 supported this statement by saying a group of "60-year-old men" would produce a completely different group dynamic than a group of "30-year-old men and women".

Cultural diversity also refers to discipline culture which can be supported by the inclusion of construction managers in Engineering phases in projects such as Project E. Other disciplines such as procurement and project control participants introduced the difficulty of ensuring progress while not overstepping working hours in different countries. In essence, availability for communication is not always a possibility, which may stagnate some responses.

Participant 18 discussed how sometimes it would be very late in Manila, and while some information is needed, it is important to respect your team members' personal lives. Already in a sense a cultural difference can be perceived in work-life balance because team members in India and Manila are more willing to work outside working hours than members in the Amsterdam office. Participant 4 claimed that based on experience team members in Manila and India were more likely to accept working overtime in comparison to their Dutch counterparts. Meaning cultural diversity creates room for project activities to be fulfilled. Some extracts from the interviews relating to cultural diversity are presented in Table 14.

*Table 14- Extracts from the interview transcripts related to cultural diversity.*

| Quotation | Reference |
|---|---|
| **Topic:** Cultural diversity in projects by Participant 14.<br><br>*"Start from the fact that you have a (Client Name) culture, a Fluor culture, a German national culture that tends to be quite hierarchical and quite structured and pushed into a certain framework and a way of thinking."* | Many factors influence a project's culture. This extract outlines the key cultures observed in Project D. |
| **Topic:** Problem-solving is enhanced due to different ways of looking at a problem.<br><br>*"I mean when it comes to projects because it helps to bring in different thought process**es** to solve particular problems. This is what I have learned and experienced in the past because it helps you to give different damage and altogether to come to a solution. Probably if there's a problem, if you don't have diversity, even the mindset and the thought process are not diverse. So**,** it does help us to bring it"* | This extract conveys the importance of cultural diversity in difficult decision-making due to diverting the minds involved and the chances of looking from a different perspective. |

## 4.3 Conclusions

*Table 15- summary of key findings per theme of interviews.*

| Theme | Key findings |
|---|---|
| **Cultural awareness methods** | - Consistency supersedes static methods.<br>- Authentic practices have a larger chance of being successful.<br>- There is no structured procedure at the project level,<br>- Projects agree that it is important, but it is not handled at the same level in each project.<br>- Project managers have a large impact on what is being conducted in the project team. |
| **Project execution** | - Project execution requires open communication and speaking up with conflict arises, especially with the recent transition into agile project execution.<br>- Some remnants of national culture exist in the way offices execute tasks.<br>- Some variation exists between phases of the project, where different nationalities find it difficult to integrate.<br>- There is tension between disciplines when their importance is neglected. |
| **Organizational culture** | - Organizational culture often supersedes national cultural differences.<br>- Tension may arise between organizations if organizational culture is not addressed.<br>- Interviewees identified with being a part of Fluor, and uniting within the company's sphere of influence. |
| **National culture** | - Hierarchy in Manila in comparison to network governance in the Netherlands.<br>- National culture should be considered when planning events. |

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|---|---|
| | - Certain national cues should be taught to decrease the likelihood of misinterpretations. |
| **Generational culture** | - The perception that younger employees require more education in cultural awareness due to lack of experience.<br>- Ironically, to the first point, underestimating employees due to their years of experience has proven to be wrong.<br>- Virtual workspace transforming traditional ways of working |
| **Cultural diversity** | - Cultural diversity expands on the possible scenarios available to solve a problem.<br>- Each individual and discipline in a project supplement the quality with their unique set of skills and values. |

The interview stage provides several critical insights that need to be considered to effectively incorporate cultural awareness in EPC projects. A summary of the key findings is illustrated in Table 15. The findings underscore the importance of the content behind raising cultural awareness, focusing rather on the consistency and authenticity of its implementation.

It is important to recognize tools and activities as methods to foster integration rather than solutions to this intricate predicament. Furthermore, consistency relates to the dynamic nature of culture which requires an equal strategy when implementing cultural awareness.

Furthermore, the unique nature of project teams creates the need for authentic practices that balance collective stereotyping with spaces to fulfill and allow individualistic behavior. Furthermore, authenticity and genuine interest between team members are more important than the type of tool, if a sense of vulnerability is expected to be expressed, team members need to feel it is both ways. Simple social exchanges such as song sharing or engaging in social activities create opportunities for informal interaction to occur, fostering trust among project team members.

A key takeaway is that cultural diversity is embedded and inevitable in project delivery of EPC projects. Cultural diversity in the project team is beneficial for problem-solving and integrating different perspectives to execute complex projects, yet this can only succeed if cultural awareness is integrated effectively. The importance of constructing a safe and open environment where team members can “speak up freely” is important in cultivating the benefits of cultural differences.

In summary, the key message is that open communication, transparency, and trust were key factors in the success of project teams. Regular meetings and visits, including social exchanges, especially in virtual workshare scenarios, help foster inclusivity between the project team.

# 5. Mechanisms to develop cultural awareness

## 5.1 Basis of design

A key aspect of the literature and interviews was that cultural awareness should be incorporated as a process with continuous revision throughout the project lifecycle, reflecting the dynamics of the culture and its evolutionary traits.

To facilitate the implementation of cultural awareness in EPC projects, a framework was generated based on the insights gained to provide a structured approach for project team leaders. While the results conveyed the need for cultural awareness was prominent in the cases analyzed, there was no structure in its implementation.

Firstly, the discovery of the different layers of culture that exist at a project level, the results of the interviews discovered that the prominent themes in projects conducted by the research sample were national, organizational, project, disciplinary, and generational layers. The literature review offered a slight variation to this, including sub-cultures such as operational, professional, and individual subcultures.

This resulted in the realization that identifying the layers of culture is related to the perception of the identifier, reflecting the subjective nature of culture. Therefore, a framework is developed to provide flexibility in doing so, this will be discussed in more detail in the subsections to follow.

Moreover, another insight identified emphasized the importance of authentic and consistent application of cultural awareness to develop a meaningful impact on the project environment. Implementing regular cultural awareness initiatives throughout the project lifecycle, rather than one-time events, was suggested to resonate in consistent stimulation of cultural awareness.

Recognizing the personal biases of team members about other cultures was another key finding related to the individual and collective concept of culture. It was encouraged to reflect on team member's own biases and cultural positioning about others, this can be facilitated with tools such as Globe smart or Hofstede's cultural dimensions tool since self-awareness was related to comprehending cross-cultural relations.

The target audience of the framework is targeted to project managers and to ignite a proactive role from the people and culture department to coordinate the implementation of cultural awareness. Since insights suggested that project managers have a key role in running projects, there needs to be an incentive directed from a higher chain of command.

Therefore, a split into three hierarchical levels was conducted to ease the implementation of cultural awareness in EPC firms into three levels: corporate level, office level, and project level. Figure 22 on the next page outlines the key factors to consider when raising cultural awareness.

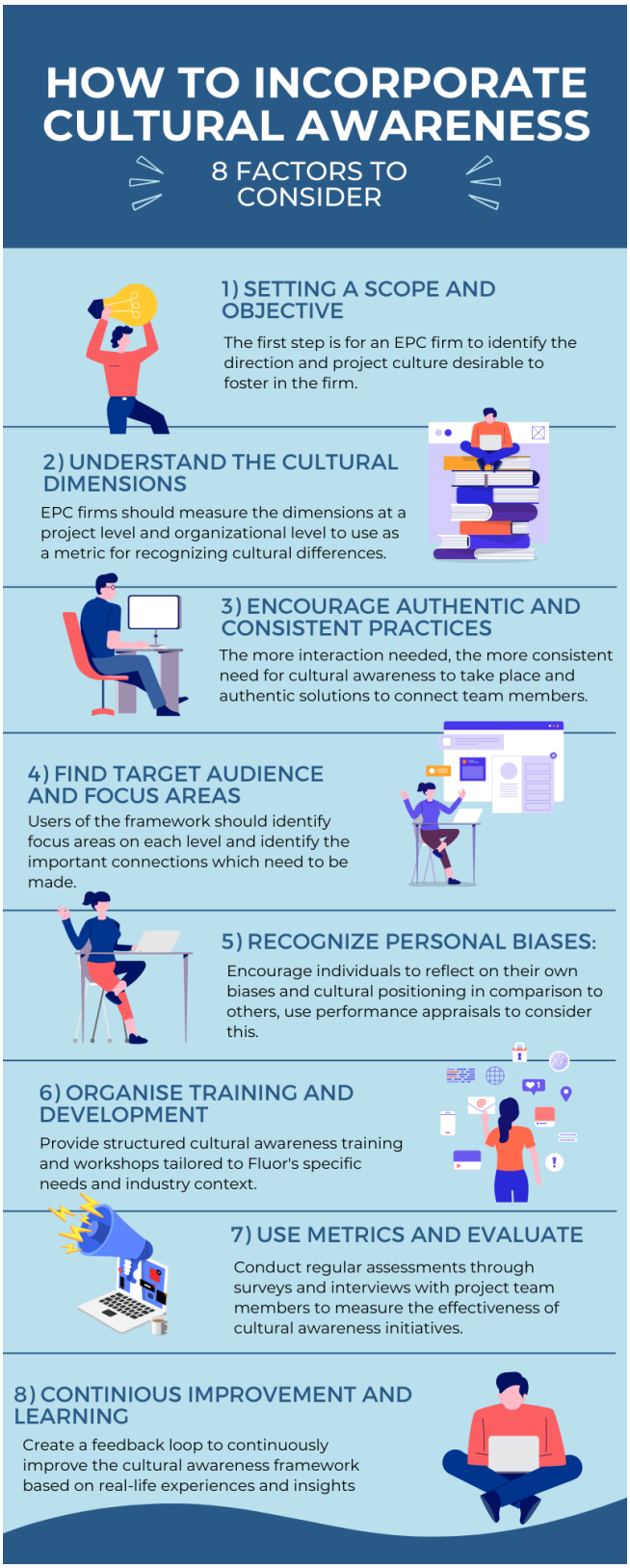


*Figure 22- Factors to Consider incorporating cultural awareness.*

Cultural awareness is intended to ensure the inclusivity and participation of project team members that need to be connected. The periods where cultural awareness is planned to take place should foster a supportive and inclusive environment that encourages open dialogue and exchange of ideas. Promoting engagement and inclusivity consists of engaging with most project team members by actively involving everyone in discussions and activities.

Instead of providing all the answers, the individual leading this discussion or cultural awareness activity must develop the habit of asking thought-provoking questions, encouraging their team members to think independently, solve problems, and contribute to decision-making processes (Marquet, 2020)

This approach establishes a dynamic activity, including team members' subjectivity in the process. This revolves around asking questions that require longer than one work response. For example, instead of asking "Do you agree?", you can ask "How would you argue against this?" Or what elements do you agree with?" (Marquet, 2020). These types of questions stimulate system II thinking, asking team members to think deeply about the questions rather than relying on heuristics (Propsma, 2023).

## 5.2 IPAR Framework

To optimize the inclusion of cultural awareness, a framework was developed to include the factors mentioned above in a concise cycle to be implemented at different levels of operation: corporate, office, and project level as illustrated in Figure 23.

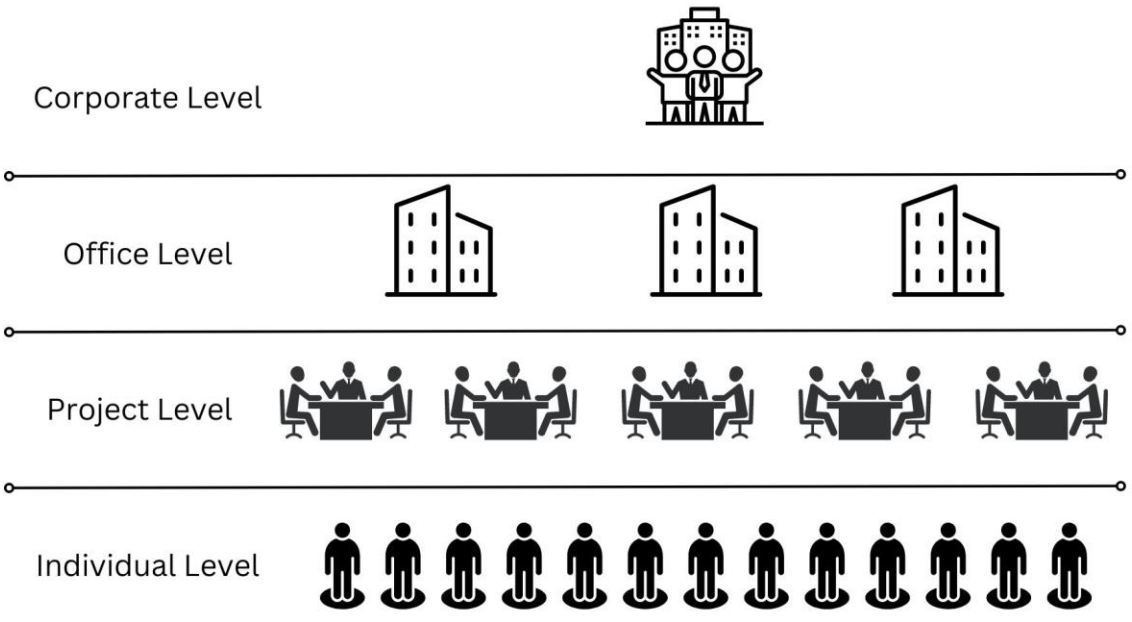


*Figure 23- Levels of operation in a Multinational EPC firm*

A key aspect of the literature and interviews was that cultural awareness should be incorporated as a process with continuous revision throughout the project lifecycle, reflecting the dynamics of the culture and its evolutionary traits.

This laid the basis for creating the IPAR framework consisting of a consistent procedure of identifying the cultural differences in the project; planning cultural awareness implementation; Applying the plan; reflecting on the results and recording findings. Figure 24 portrays the basic procedural framework.

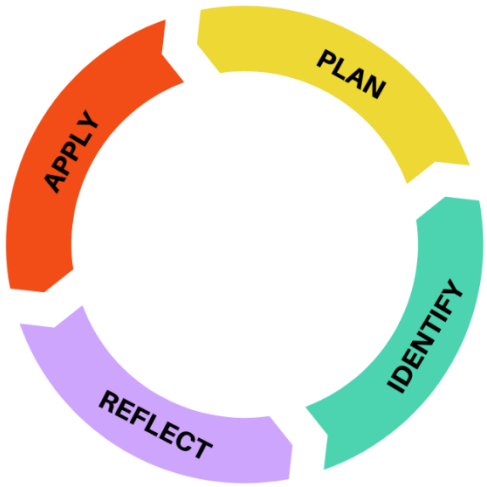


*Figure 24- A basic procedural framework for cultural awareness: IPAR.*

Previous chapters revealed that cultural diversity coexists and interacts concurrently in a project team environment. Therefore, it is recommended to foster cultural awareness and understanding between these cultures to optimize the benefits of cultural diversity and minimize the negative symptoms associated with cross-cultural collaboration.

Each component of the IPAR framework is created based on evidence and arguments built upon previous chapters in this thesis. A key component of IPAR is the agile management associated with starting the process with sub-optimal knowledge and continuously learning by doing, by constantly evolving the way of working as the procedure progresses, innovative cultural awareness techniques and content can be incorporated (Highsmith, 2009). The next sub-sections are focused on discussing each phase in more detail, and how they should be approached he each level of operation.

The identification of cultural differences in the process is primarily oriented toward breaking down the culture of project teams into dimensions. Many studies have culminated dimensions, but the

basis based on the literature review is Hofstede's Cultural dimensions which fueled tools such as Globe smart.

In essence, the first part of this layer would recommend that an EPC firm should mandate the completion of a yearly questionnaire that identifies their positioning on the different dimensions of a selected tool. By doing this, the data can be combined to identify many different levels of cultural differences and can be used as a reference at the different operation levels.

The study should be conducted every year to accommodate the evolving nature of culture. Furthermore, the question should be updated to configure an accurate representation of the current cultural positioning. The results will be used to identify the culture at different levels of operation, resulting in identifying the organizations culture, the office culture, the project culture, and the individual culture.

After identifying the cultural differences and specifying a scope to address, it is crucial to plan an implementation strategy at each level of operation. A summary of the IPAR cycles based on the level of operation is presented in Table 16.

*Table 16- Summary of IPAR Cycles.*

| Level of Operation | Review Cycle |
|---|---|
| **Corporate** | Yearly |
| **Office** | Quarterly |
| **Project** | Monthly |
| **Individual** | Yearly |

The **corporate level** should foster training that can be undertaken globally by the EPC firm employees, this can be in the form of digital training and development sessions. Consistency is needed to establish an effective presence by having yearly sessions obligatory to be conducted focused on general cultural awareness involving the main layers.

In other words, the EPC firm's implementation strategy of the different layers of operation should be shared with the employees, resulting in accountability from each level of operation and an understanding of the reasoning behind the importance of cultural awareness. This is important for reminding existing employees and in boarding new employees into the firm, to encourage focus in the online sessions, they should be redeveloped every year by feedback received from employees. Therefore, effective planning is needed to generate this online interactive course.

The **office level** should plan activities in each quarter directed towards the different layers of culture such as disciplinary differences, generational differences, and national differences. The creativity of a steering committee such as the people and culture department are required. Since the office exists in one location it is possible to use many different techniques such as lunch and learn, guest speakers, and interactive workshops.

The important role of the office is to translate corporate goals into the tactical level focusing on the tactical level of culture. This requires planning every quarter to ensure high-quality lunches are conducted with many participants.

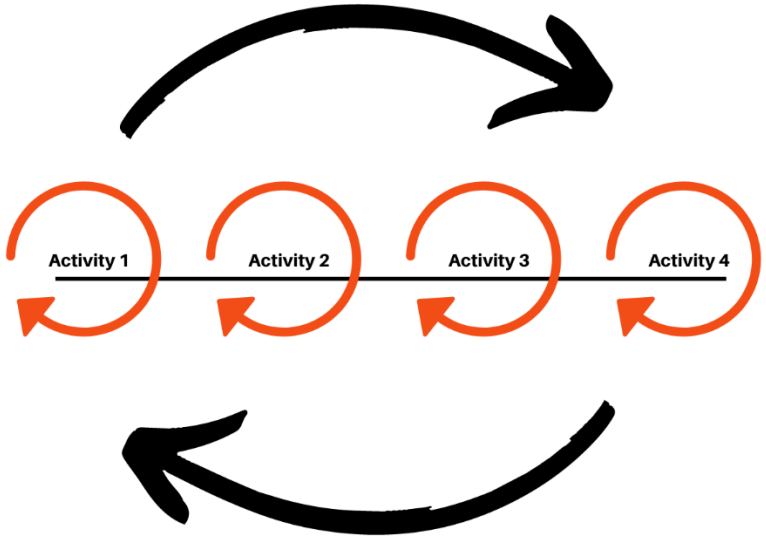


*Figure 25- Agile reflection small scale and large scale.*

Figure 25 outlines how the office steering committee should reflect on each activity implemented, then restructure the execution plan every quarter. The office has a crucial role in connecting corporate goals to the office level.

Evaluating the efficacy of cultural awareness initiatives can be facilitated by the judicious monitoring of participant responses obtained through surveys, or open dialogue on their experiences in the sessions.

The **Project level** needs to plan and share the proceedings in the Monthly Progress Report to ensure the participation of project team members including the client team. By establishing dates and highlighting the significance of cultural awareness, a sense of dedication and responsibility is fostered among team members.

This could encourage proactive involvement in sessions or questionnaires. Moreover, this proactive approach ensures the seamless integration of cultural awareness activities in the project timeline, guaranteeing that they receive the requisite focus and allocation of resources for their effective implementation.

There should also be a mandated budget to invest in these types of activities to ensure alignment and collaboration throughout the project lifecycle, especially if the project team changes over time.

The specification of content and focus of the strategy need to be translated into tangible actions such as workshops, or weekly meetings guided by a people and culture team representative responsible for organizing the main workshops.

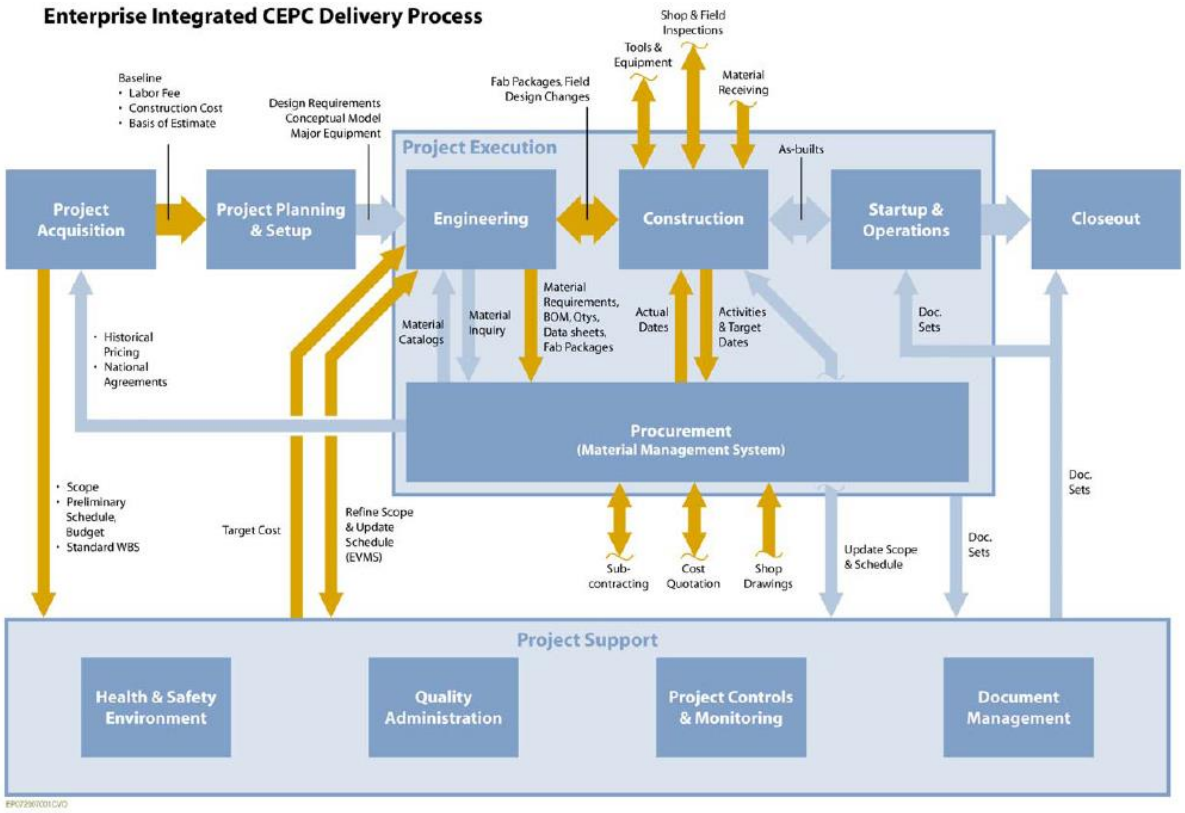


*Figure 26- Sample EPC execution schedule retrieved from (Carlson et al, 2007).*

Figure 26 reflects the standard EPC schedule, which reflects the complexity of the different phases and stakeholders involved. The IPAR framework should be incorporated early on and consistently recycled to improve and reflect on actions implemented.

Furthermore, the project team members may change as the project progresses, this means that the project culture should adapt to the needs of new active stakeholders and therefore, new project culture. Ideally, the IPAR framework would be applied as early as possible for the duration of the entire project.

The reflection takes place every month to set a goal for the workshops or activities that will continue to take place the following month, ensuring consistency in raising cultural awareness.

Finally, the **individual level** should be planned during the yearly goals and assessed by a yearly performance appraisal. EPC firms tend to have career development plans, by including a section oriented towards cultural awareness, a goal can be conducted to expand and grow.

This can be done by switching disciplines through rotations, going on an assignment abroad, or even pledging to participate in at least three cultural awareness sessions in the year. By choosing a plan based on the yearly performance appraisals employees are responsible for engaging in tasks

to evolve and learn through the year, and a reflection is conducted by assessing what has been done and planning for the following year in the performance appraisal feedback with discipline leads.

## 5.3 Expert evaluation of the IPAR framework

*Table 17- Summary of evaluative interview participants.*

| Interviewee | Department | Function |
|---|---|---|
| **Participant I** | Project and Culture | Operations lead |
| **Participant II** | Project and Culture | Engineering lead |
| **Participant III** | Project and Culture | Communications Specialist |

The feedback was focused on two criteria: the content of the framework and its applicability in future EPC projects. The first insight regarding the content of the tool was the need to consider which individuals need to be connected. The IPAR framework initially focused only on identifying cultural differences between the existing teams, then planning the period in which these interactions would take place. A critical gap was not mentioning which people should be involved in cultural awareness activities.

Participant II argued that the real challenge is connecting the stakeholders involved in a task to decrease the negative symptoms and optimize the value stream in Project development. Figure 27 conveys the meaning behind stimulating connections between the people needed to collaborate on a task. If there is no relationship, it is difficult to find the information needed at the fastest rate. Furthermore, if these relationships are not positive, they can create many blockages in collaborative efforts.

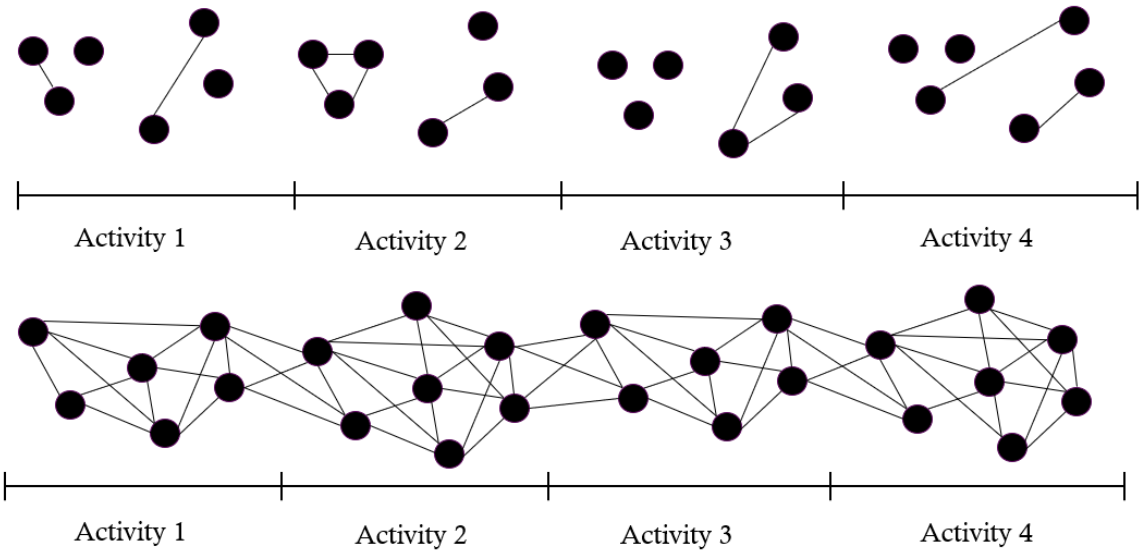


*Figure 27- Value stream negative symptoms (top) and positive symptoms (bottom).*

Figure 27 also reflects the connections needed for effective collaboration and information transfer. Cultural awareness can reduce barriers and increase positive connections between team members, introducing a crucial parameter of connecting the right individuals. This reiterates the importance of many review cycles through a project lifecycle due to the different stakeholders and interfaces associated with an EPC project.

To incorporate this feedback in the cultural awareness framework, the planning section was enriched to reflect this important parameter. In addition to this insight, a discussion arose about the fundamental needs of people within project environments. Maslow's Hierarchy of needs suggests that humans have a basic physiological need that needs to be met before striving for higher-level needs, these needs can be viewed in Figure 28 (McLeod, 2007). In fact, during the interview, Participant I argued that although the needs might be the same, the translation of them into practice is different, and is partially based on Cultural differences between different people.

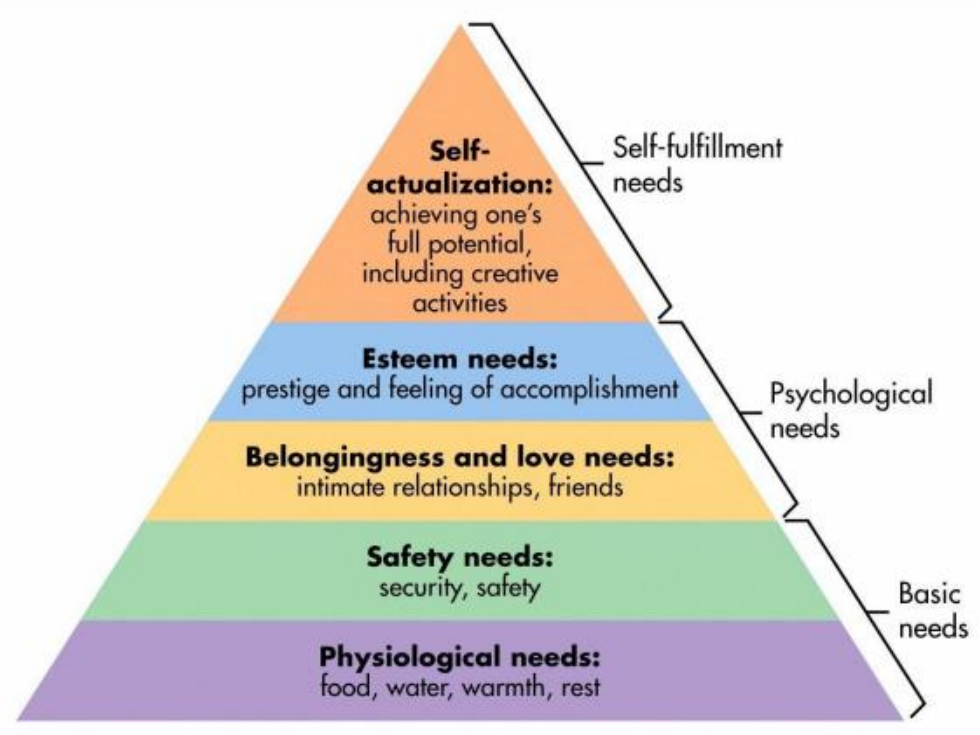


*Figure 28- Maslow's hierarchy of needs retrieved from (McLeod, 2007).*

Moreover, another key insight gained from the interviews regarding application was the challenge of incentivizing the use of the framework, particularly when project managers often exhibit resistance to implementing additional scope and are sometimes overloaded. Participant III suggested there should be an important mechanism to secure buy-in from individuals who hold authority over project execution. Project managers need a sense of autonomy to steer the project based on their expertise, and real-life practice requires support to apply the framework.

Incorporating the IPAR framework would result in additional workload which needs incentive and support to apply effectively. It was suggested that smaller teams may be more manageable, due to the higher level of direct interaction between team members, making it more feasible to engage in cultural awareness practices.

On the other hand, larger teams often have a higher number of stakeholders, which requires more effort in applying the IPAR framework. As a response to this feedback, it is pertinent to consider the active role of the people and culture department to act as a steering committee to advise project teams on implementing IPAR.

## 5.4 Concluding remarks

Since culture is a complex term, it does not have a simple solution, rather a guideline has been developed through implementing the IPAR framework on four levels of operation: corporate, office, project, and individual level. Creating a progressive plan implemented concurrently at many levels through an EPC organization.

EPC project teams can encourage understanding, and inclusivity by implementing IPAR; a cultural awareness framework that includes identifying cultural differences, planning cultural awareness activities, applying tools while adhering to the plan and inclusive behavior, and reflecting on outcomes.

As a result of the findings of the literature review and interviews, the IPAR framework follows a repetitive procedural cycle intended to stimulate learning and development of raising cultural awareness in EPC firms by optimizing each level of operation.

Reflection is a key phase of the process as it promotes the development of cultural intelligence which evolves and adapts to the project team as the project lifecycle evolves, this is the same for different levels of operation by the cycle periods are different for each level of operation.

A key fragment of EPC projects is the fragmentation of the industry which gets infected with negative symptoms if the right people are not connected. Figure 29 illustrates the combination of the procedural framework with the constant review cycles expressing the intent of going through each phase.

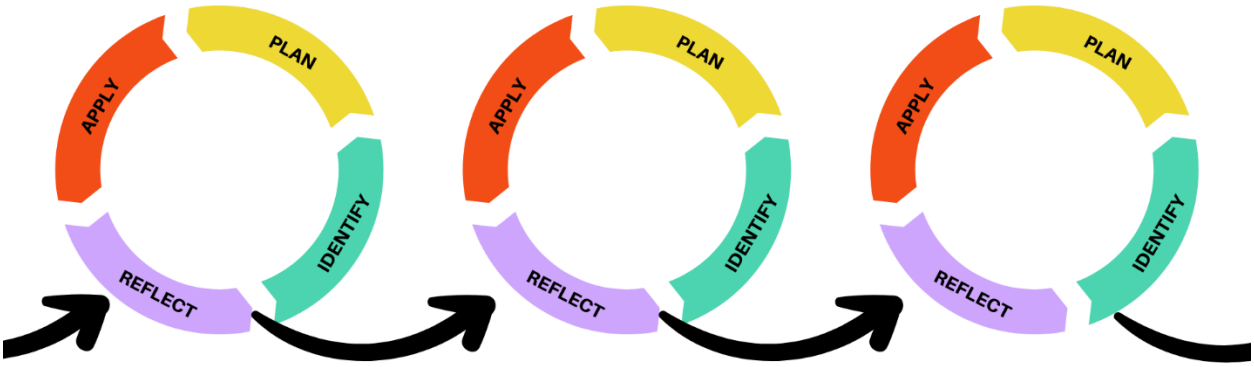


*Figure 29- IPAR Framework Concerning Project life cycle.*

The IPAR framework is intended to be utilized consistently over the duration of an EPC project and assessed monthly. At the office level, it is assessed quarterly, and at a corporate and individual level, it is assessed yearly.

IPAR framework is instrumental in aligning EPC firm employees and stimulating collaboration with a focus on the positive symptoms of working with one another. By implementing the IPAR

framework, challenges in cultural differences can be identified and proactively discussed to raise awareness resulting in a better understanding of each other's way of working.

Effective collaboration and alignment are only reached when team members concentrate their energy and efforts on problem-solving rather than engaging in negative symptoms. Therefore, connecting the right groups of people and raising cultural awareness will increase the understanding of cultural differences and minimize negative symptoms of behavior.

# 6. Discussion

## 6.1 Content

Based on the findings of the literature review, identifying a precise definition of culture proved to be a challenging endeavor. The interviews conducted further substantiate the conclusions drawn from the literature study regarding culture's comprehensive nature and the potential for misinterpretation among project team members during discussions. Consequently, it is recommended that a concerted effort be made within the team to establish a shared understanding of culture, as opposed to assuming its universality. Such alignment in defining culture is likely to foster heightened cultural awareness. Looking through the ambiguity, layers of culture can be derived to convey relative insights in a project team environment. Culture embodies many factors, but the results of the interview suggest that understanding the different layers identified is a good starting point to incorporate cultural awareness in EPC projects.

The results of the interviews highlight various methods and strategies employed by Fluor to promote cultural awareness in project teams. There was a difficulty in balancing when an attribute was a collective cultural characteristic or reflected individualistic behavior. This is a very interesting source of knowledge because it relates to how one perceives culture. Two out of the five project teams already utilized methods directed towards raising cultural awareness in EPC projects, including specifically globe smart and hanging country flags on the wall. However, this was primarily directed to national cultural differences as opposed to the other layers identified in the interview phase.

Specifically, when a few participants argued that organizational culture overrides national cultural differences, an interesting relationship was also seen in previous research conducted by cross-cultural implications on contracting which revealed cultural differences between clients and contractors do not raise conflict if the contractor adapts to the client's organizational culture (Rezaiemoghaddam, 2014). This research also recommends that recognition of the client's culture early in the project is essential to avoid negative impacts on the relationship between the client and contractor (Rezaiemoghaddam, 2014).

The interviews revealed that on many occasions, participant's first assumption when discussing cultural differences often translated to national differences, emphasizing the impact of national, and regional cultures on project execution. While Organizational culture was often superseding national culture, variations in ways of working between offices were often conveyed through the interviews. Specifically, the hierarchy in Manila was discussed, which as observed in Figure 30, reflects the power distance index in the Philippines is higher than in the Netherlands. The Netherlands fostered a more flexible and inclusive environment, where opinions are expressed freely, as opposed to a hierarchical environment with a power imbalance.

Direct communication style was exhibited as the form of collaboration expected in the Netherlands, often attributed to their national culture. This was appreciated and misinterpreted at

times by international colleagues. In essence, direct communication facilitated effective communication and comprehension agendas. In Figure 30, the Netherlands rank one of the lowest in terms of Power distance, which could suggest the relationship of communicating in a network mode of governance.

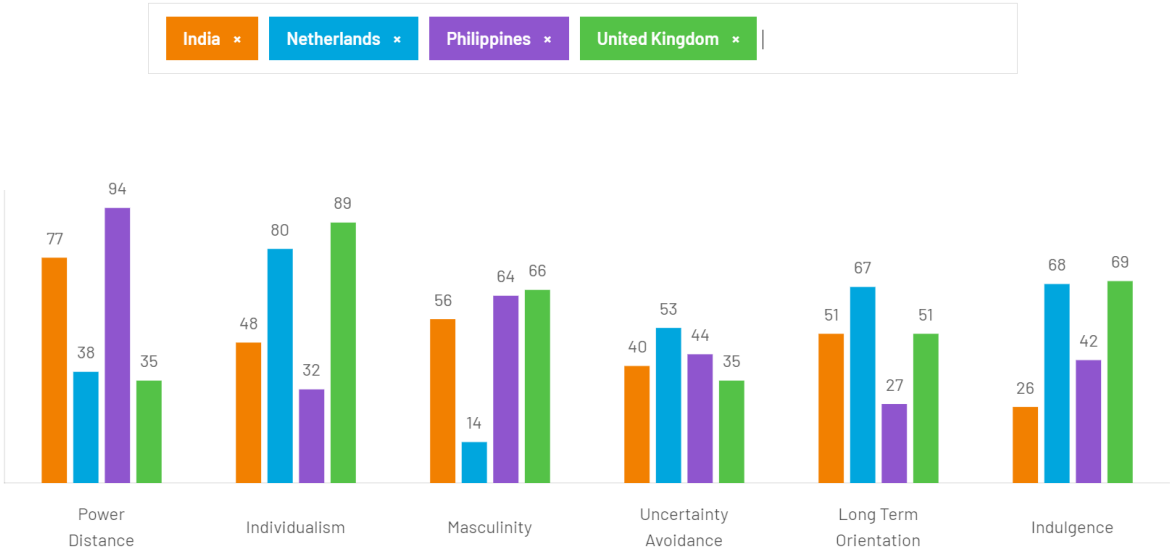


*Figure 30- Country Comparison tool retrieved from (Hofstede, 2023).*

Furthermore, the discussion on whether culture is an individual construct or a collective construct is often debated. The literature review concluded that culture was both an individual and collective construct. While the interview reflected a variety of different opinions regarding the topic. Some suggest that it was purely individuals' behavior and that it reflects a person, not necessarily a shared perspective. The risk of judging people's actions based on their behavior while excluding cultural considerations is that a misguided judgment may fall upon a colleague which is untrue because humans may have the same values at times but they are translated differently through their actions and behavior (Meyer, 2016).

Therefore, it is pertinent to understand your cultural influences to understand where you stand relative to other individuals (Meyer, 2016). Looking at Figure 31 on the next page, a spectrum between individualism and collectivism factor is portrayed. This is used to illustrate that relative to Person A, Person B is very collectivistic in their beliefs. However, Person C conveys Person B as very individualistic in their beliefs. Therefore, the perception of Person B's culture is different if you ask Person A or Person C. This conveys the argument that one must understand their cultural positioning concerning others when conveying cultural awareness.

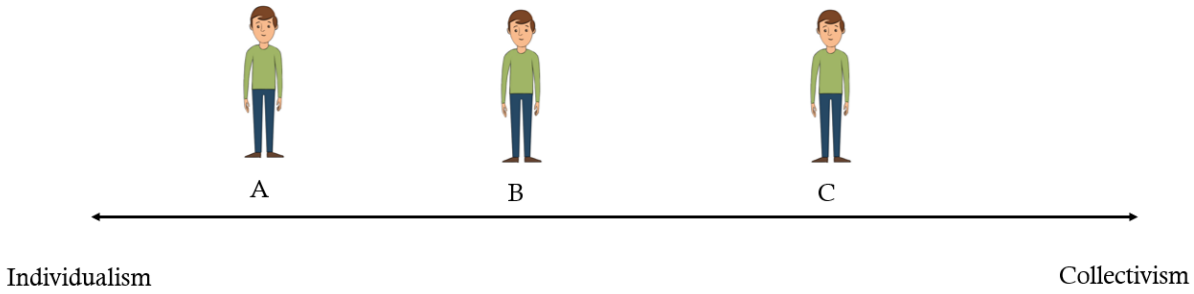


*Figure 31- How relativity impacts the perception of different cultures.*

The inclusion of cultural awareness in project environments requires a deviation from the standardized approach to fostering critical thinking and continuous cycles throughout the project lifecycle. Since the project involves different stakeholders, cultural awareness procedures should take this into account and shift from a "one-size-fits-all" approach, cultivating the need for critical thinking, self-reflection, and navigating complex cultural dynamics to reach a competent cultural awareness of individuals in project teams (Christopher et al, 2014).

This results in authentic solutions for a dynamic dilemma. The Interviews set a high expectation for the need for authentic solutions, materials should effectively reflect the cultural context and real-life situations in projects that team members might encounter (Pulverness & Tomlinson, 2003).

Another major finding in the interview was the generational culture differences which were not identified in the literature review phase. In a sense, if a set of norms, values, or beliefs are shared between a group of people it forms a separate culture.

There is a chance of conflict between cultures. As a result, stereotypes may arise such as older workers labeling younger workers as lazy or lacking respect for authority (Maciutaite, 2023). With the emergence of technology and changes in society, it is important to raise awareness of generational and appreciate the strengths of each generation.

## 6.2 Limitations

This study aims to investigate how cultural awareness should be implemented in future EPC projects. In that regard, some limitations should be acknowledged that may have impacted the results of this study. When analyzing and evaluating these findings, these limitations need to be acknowledged.

Firstly, the interviews were conducted with one EPC company: Fluor, and only on projects under the Energy solutions business line in the Amsterdam office. As a result, the conclusions derived

from this research may not fully capture the entire scope of EPC project teams, since often the project owner and external stakeholders are involved.

Furthermore, the applicability of the findings in different business lines may need to be revised and tested, due to the data being collected only from energy solution projects. Also, the organizational cultural impact may have influenced the responses from participants, and not directly reflect the generalized incorporation of cultural awareness in EPC projects conducted by different organizations.

Secondly, the interviews were conducted with managers of different disciplines from five projects conducted at Fluor. The interviews were planned to avoid biases while collecting results, despite the efforts, human coding may have incorporated subjective bias or missed certain themes.

In addition, the focus on current projects may limit the representation of cultural dynamics, which evolve and change at different levels of project delivery. More specifically the sample size could not be enough to identify all layers of culture affiliated with project delivery in EPC, so more layers may be identified if different firms and business lines utilize the IPAR framework.

The time frame of the graduation was limited to six months, which restricted the depth of data collection and analysis, meaning there was only a short window to conduct interviews with project team members.

The interviews have been supported with similar findings as the literature review, increasing the validity of the study and conclusions drawn. Furthermore, the final solution was evaluated by the people and culture department at Fluor who are responsible for conducting activities related to culture in the Amsterdam office.

# 7. Conclusions and recommendations

## 7.1 Answering the research questions

### 7.1.1 What is culture in the context of EPC project delivery?

Defining culture in the context of EPC projects was challenging, given the holistic nature of the concept and the multitude of dimensions it encompasses, supplemented by the many layers involved. Scholars and researchers in the field struggle to align on a unanimous definition.

This was further supported by the interviews which included an array of different understandings of what culture is, highlighting the ambiguity revolving around the term. However, a review of various viewpoints reveals recurrent themes that illuminate its core. In this context, culture refers to the ideas, standards, and customs that influence how people interact with one another.

It has an impact on project delivery, setting unwritten rules that are set in the project environment and shared between a group of people. Culture is perceived as both an individual and social construct, developing the foundation of different perspectives among team members.

To facilitate the understanding of culture in the context of EPC projects, culture has been derived into distinct layers, including national culture, industrial culture, organizational culture, and professional culture.

This breakdown provides an opportunity to gain insights into the diverse cultural elements of culture in project execution. While project culture may draw upon certain national attributes exhibited by team members, this research suggests that it can surpass the influence of individual national cultures.

Culture represents a combination of values, behaviors, and actions exerting a profound impact on the cognitive processes and social mechanisms occurring in a project lifecycle. Findings from this research underscore the relevance of a precise definition due to the dynamic and evolutionary nature of the concept.

Rather, it is recommended that project teams engage in active collaboration to find the different elements associated with culture. This research identified layers of culture to serve as a starting point for the effective integration of cultural awareness in EPC projects.

In summary, Culture is a collection of unwritten rules in project teams that are shared between groups of people and have an impact on the positive and negative symptoms associated with conducting EPC projects.

### 7.1.2 How does cultural diversity impact project teamwork in EPC projects?

The impact of cultural diversity on project teams has been a difficult endeavor to understand the relationship between the two. Cultural diversity within culturally diverse project teams includes members with a range of cultural backgrounds and identities.

Cultural diversity displays the potential for a positive impact by fostering a range of perspectives, ideas, and solutions from different stakeholders in the project team. However, it is crucial to foster an inclusive environment marked by respect and open communication to fully capitalize on the advantages of a diverse project team and manage conflicts resulting from cultural differences.

The literature review did not distinguish a precise conclusion on what cultural diversity offers as it seems rather ambiguous. Therefore, a larger dependence was shifted toward the interviews to discover the possible relationship between the two parameters.

The interviews suggest that cultural diversity in project teams enhances collaborative decision-making by considering the problem from different perspectives. Another important factor that emerged was the effect of time zones between various office locations. The benefit of "working around the clock" in engineering disciplines was mentioned by participants.

By utilizing time zone differences to enable 24-hour work shifts, this practice is in line with the expedited project delivery methodology used by companies like Fluor. However, this could be linked to time differences as opposed to cultural diversity. The key difficulty is managing these interfaces, and due to cultural diversity management is required to configure different techniques to meet the team’s demand.

In summary, this research identified the potential benefits of cultural diversity in project teams, including improved decision-making and expanded work hours. However, the research highlights the importance of managing these interfaces which requires more effort.

### 7.1.3 What are the current levels of cultural awareness in EPC projects?

There are different forms of cultural awareness methods implemented in the current EPC project but are not obligatory to implement and are usually only discussed at one period early in the project. Current methods include tools to express the cultural differences in teams as well as unique methods to stimulate an informal conversation and create connections between project team members.

Projects vary in terms of the concentration on cultural awareness orientation, this primarily relates to the project manager’s strategy for executing the project. Some projects also incorporate virtual cues such as countries’ flags, or illustrations of team members’ positions on the different cultural dimensions, serving as a visual reminder to appreciate and respect diverse cultures. There were no key guidelines or frameworks that aligned different projects in how they approached cultural awareness.

Furthermore, attached to the level of cultural awareness is the quality of activities executed to stimulate awareness. Cultivating genuine interest and nurturing vulnerability within the team is essential to create a space of authentic practice.

Current cultural awareness methods that were coerced tended to lose their value due to the lack of authenticity and interest. Conversations about values and norms can take place in relaxed environments created by simple tasks such as playing a song on the speakers during weekly meetings or taking part in social gatherings like bowling.

These interactions fostered a culture of openness and inclusivity and created trust among team members. In addition, learning about food and celebrating cultural holidays can provide useful insights into a variety of cultural practices and culinary traditions.

### 7.1.4 How can cultural awareness be stimulated between project team members?

This research has conveyed a variety of tools and initiatives intended to develop cultural awareness between project team members. The key variable missed in most of these methods is regulating culture as an ongoing and iterative procedure as opposed to a one-time remedy. The research suggests that regular evaluation and discussion of cultural differences are imperative in effectively raising levels of cultural awareness in EPC projects. Furthermore, the methods should be proactive and allow room for flexibility for each project team. The research underscores the intricate nature of the methodology employed, it rather focuses on the intent and strategy behind the motion.

The basis of design for incorporating cultural awareness throughout EPC projects involves continuous revision and integration of cultural understanding across all project phases. A framework was developed to guide project team leaders in implementing cultural awareness effectively. The framework addresses the identification of different layers of culture within projects, encourages authentic and consistent application of cultural awareness, and highlights personal biases and cross-cultural relations. The target audience is EPC firms with the framework operating at three hierarchical levels: corporate, office, project, and individual.

The IPAR framework focuses on four main steps: identifying cultural differences, planning cultural awareness implementation, applying the plan, and reflecting on the results. The framework operates at various levels of operation within EPC firms. The corporate level emphasizes global training sessions, while the office level plans quarterly activities targeting specific cultural layers. The project level integrates cultural awareness into monthly progress reports, ensuring active participation. At the individual level, yearly goals and performance appraisals promote personal growth through cultural awareness activities.

The framework has been evaluated by experts in people and culture, where the implementation of the framework aligns with the firm's overall strategy. In summary, the implementation of IPAR empowers EPC teams to proactively navigate cultural differences, fostering an inclusive and collaborative environment.

### 7.1.5 How should cultural awareness be implemented in future EPC projects?

Cultural awareness has potential benefits for collaboration in EPC projects if implemented proactively. In the context of the EPC industry, culture combines ideas, standards, and customs that reflect interactions between project team members. These cultural dynamics construct the unwritten rules in project teams which are constantly evolving with the many interfaces involved in project execution. Culture is a holistic concept impacting cognitive processes and social mechanisms through many layers in individuals, it is both an individual and social construct. EPC projects require the establishment of an inclusive environment fostering open communication and respect, ensuring an understanding of cultural differences in times of conflict and stress.

EPC projects still embody some negative symptoms and do not offer a framework to incorporate cultural awareness in projects. Different methods have been implemented but without a direct plan on what the intention behind them is. When the methods are successful, results have illustrated profound improvement in collaboration by understanding the hidden layer behind people's actions. Current methods exhibit notable variation, with diverse methods and initiatives in place, but different levels of cultural awareness fostered. The absence of standardized guidelines or frameworks is prevalent. Nurturing genuine interest by developing authentic practices is needed to harness cultural awareness in future projects.

Future EPC projects are recommended to foster a proactive and iterative approach to stimulate cultural awareness. This approach should be constantly evaluated and improved to reflect the interfaces involved in the phase of the project, rather than searching for a one-time solution.

The IPAR framework was created to incorporate these requirements in future EPC projects. This framework fosters a structured approach, emphasizing the importance of planning, active participation, and constant reflection at different levels of operation within an EPC firm.

By incorporating proactive cultural awareness processes, future EPC projects can enhance collaboration by stimulating connections between the project team and decreasing negative symptoms associated with cultural differences.

## 7.2 Managerial implications

Based on the findings of the research, a couple of recommendations regarding the incorporation of cultural awareness in future EPC projects at Fluor. This recommendation will include the implementation of the IPAR framework on different levels of operation within Fluor.

The IPAR framework has been evaluated by personnel under the people and culture department; IPAR is a cultural awareness framework that includes identifying cultural differences, planning sessions or tools, applying tools while adhering to the plan and inclusive behavior, and reflecting on outcomes through surveys or discussions.

At the **corporate level**, a Fluor University course should be mandated which focuses on the organizational culture of Fluor, and the mechanisms needed to raise cultural awareness. This course should be updated every year based on feedback from different operation levels.

Furthermore, a tool to assess cultural dimensions such as Globe Smart should be filled every year with an updated questionnaire for employees to fill in, resonating with the evolutionary state of culture and how it would change over the years. Then, an average across the organization can be used to investigate the company's organizational culture. Goals and objectives relating to culture should follow a yearly cycle utilizing the IPAR framework,

At an **office level**, the people and culture department should translate corporate objectives into the office space by stimulating cultural awareness through authentic practices such as national lunches, guest speakers, and activities. The review cycle for office space should recur every quarter, reflecting on the methods implemented and planning for the future in cooperation with corporate support and cross-office learning.

At the **project level**, it is recommended to raise awareness of cultural differences through the stimulation of informal interactions between project team members. Adopting an iterative approach throughput, the project lifecycle is advisable, as it transfers the solution into an ongoing process steered by the project and culture department.

This research recommends the people and culture department acquire a proactive role in project execution and implement the IPAR framework throughout the project lifecycle. Since the project team also includes the client and contractors, they should be encouraged to participate, and progress should be included in a monthly progress report resulting in cross-project learning opportunities for raising cultural awareness.

At **the Individual level**, Fluor should incorporate a goal related to culture in the employee goals to create a personal goal oriented towards expanding cultural barriers. This can include working on assignments, organizing a lunch with the office, or undertaking a course related to different layers of culture. This will encourage employees to grow year by year and reflect on their goals to resonate with the importance of character growth. This can also be supported by using the DISC tool and assessing how the skills can be enhanced or diverted for personal growth.

By implementing these recommendations, Fluor will be following their target of "creating an environment that encourages positive collaboration and continuous improvement" (Fluor Corporation, 2022). By focusing on project culture in a structured manner, Fluor can create an environment that simulates positive influence and constant improvement by reapplying the tool.

## 7.3 Future research

Through this research process, a set of topics have been identified which could spark the foundation of future research. These topics were not the focus of this research, but expanding academic knowledge upon these guidelines can provide insights into their relationship with collaboration.

### 7.3.1 Bridging the generational gap

The research has conveyed a glimpse into the generational gap in the EPC industry. With the prominent existence of Generation X or Millennials, only a small percentage of Generation Z. The younger generation is particularly prominent in technological advancements and derives new beliefs and expectations regarding energy use and project execution. Future researchers should delve into what these differences are in the EPC industry and how to incorporate the younger generation into the industry. Furthermore, the project culture should be inclusive to all generations and provide space for collaboration. This study may also spark an understanding of how to work with different generations and what cultural cues exist in the way of working.

### 7.3.2 Impact of digital workplace

The interviews conducted shed light on the difficulties associated with virtual teams when conducting workshare, in lacking physical cues and face-to-face communication, which makes proactive collaboration feel a bit unnatural. With the evolving globalization of multi-national companies, it may be worthwhile to investigate the shift into the virtual environment and what phases of EPC can benefit from online working. Other than the commons cost reduction, and technical capabilities arguments, more detailed research can be undertaken as this is becoming the new “normal” way of working. This research may clarify the implication of remote work on collaborations, project execution, and cross-cultural interactions. The results of such research could guide the development of guidelines to improve well-being and social mechanisms associated with virtual work environments.

### 7.3.3 The growing influence of organizational culture

This thesis report identified that in large organizations; organizational culture often overrides national culture. This relationship was also identified by previous researchers, but what implications does this have on the way of working, and is this the reality? Future studies should investigate the relationships between organizational culture and project execution.

This can be done by comparing organizations in the same nation, or similar organizations in different nations. Future studies could investigate how organizational values, norms, and practices

affect how cultural awareness initiatives are developed and put into action, as well as how they affect the outcome of projects. The results could help project managers and stakeholders manage cultural diversity effectively by examining how organizational culture and national culture interact.

### 7.3.4 Measuring culture at different phases of the project lifecycle

The interviews were conducted at a single point in the project delivery process, this was due to the time constraints associated with the production of the report. Future research into the culture at different points of the project lifecycle can provide insights that could categorize different phases of projects and see if there are certain traits associated with a phase of a project.

## 7.4 Reflection

My master's thesis was a deeply personal and academically enriching endeavor. The topic of cultural awareness in EPC projects resonated with my interests due to my cross-cultural background and the skepticism that I experienced regarding culture in diverse working environments.

My goal was to derive the meaning of culture, understand its relevance in EPC projects and explore how awareness of it affects collaborative efforts. Reflecting on the main insights gained through this research, I quickly learned that my initial expectations were somewhat naïve. Culture turned out to be a dynamic and multi-layer concept, far beyond my initial static assumption.

To begin the research, I engaged in an explorative literature review to gain insights into the concept of culture. However, defining the scope of my thesis became a challenge, given the large and surmounting influence culture is embedded. It was pertinent for me to realize that research is a collaborative effort, and my work was meant to contribute to the evolving body of knowledge regarding cultural implications.

One of the most important obstacles I needed to overcome was time management and balancing my courses, work, training, and thesis. I made it crucial from day one to maintain efficiency and prevent burnout. I engaged proactively in taking breaks, training, and partaking in social activities to maintain a balanced routine. I developed a list of priorities, and if I was not able to finish it on a given day, I would simply rest and continue to the next point the day after. I wanted to enjoy conducting research and ensure I put in my best effort.

My thesis committee played a key role in supporting me throughout my thesis journey. They guided me from the smallest grammatical errors to the complex challenges of scoping the research. The progress meetings were periods of debates and discussions regarding the topic from different experiences which taught me a lot regarding understanding the theory and practice. I am grateful for the discussions and privilege of engaging with brilliant minds.

I am very proud of every letter presented in this thesis as it reflects the work performed and the knowledge I gained throughout the process. Furthermore, I learned the importance of visualizing my work and ensuring each section had an intent rather than compiling a bunch of words. The experience also gave me a glimpse into the life of academics, and how their work resembles a work of art reflecting their evidence-based argumentation.

The entire graduation process was transformative, conveying the power of dedication and constant reiteration. Despite external opinions on how I conducted my life, I remained focused on my beliefs. I shifted from being a passive consumer of knowledge to actively challenging existing literature and industry professionals.

If I were to redo this thesis, I would focus less on trying to find or predict an end solution, as that often limits the research opportunities. I learned this throughout the duration of my thesis. Furthermore, I would also be more patient in defining a complex concept, such as culture, which doesn't have a concrete answer. Then again, some structure is needed, to ensure that the data collection complements the outcome. Perhaps experimenting with different methods to extract data from the interviews could have enhanced the insights gained from the interview stage.

In conclusion, my thesis journey of cultural awareness in EPC projects was an enriching experience filled with personal and academic growth. It instilled my independent capabilities of steering a research project and nurturing an appreciation for feedback and collaboration.

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# Appendix A-1 Literature Review

*Table 18- Overview of the initial articles discovered and key insights.*

| Author | Type of Research | Key Findings |
|---|---|---|
| **Ankarah (2007)** | A quantitative research methodology was implemented to investigate the culture within the project coalition. | • This paper revealed five principal dimensions of culture along with the application of different organizations, oriented toward organizational culture. |
| **Ban, T. V., & Hadikusumo, B. H. (2017)** | In all, 60 people with experience in EPC projects were interviewed for the study. Axial and selective coding was used to build the final grounded theory. | • This study provides empirical evidence for the importance of cultural factors that affect the success of EPC projects.<br>• The main cultural factors affecting the performance of EPC projects are leadership, organization, planning, communication, human resources, goal, and orientation. |
| **Hofstede (1980)** | The dimensions were derived through a decade of research at IBM with more than 50 countries used to gather data for comparison using factor analysis. | • Six research-based cultural dimensions intended to understand differences between countries and organizations. |
| **Hoole & Du Plessis (2002)** | Literature study toco begin then developed a qualitative dimensions questionnaire and concept mapping to compare the results to support the project management assessment framework. | • Multiple methods are the most accurate way to capture the idiosyncrasies of an organization's culture. |
| **Schein (1991)** | Survey research approach into organizational culture accompanied with interviews. | • Developed a model for analyzing organizational culture based on a series of variables. |
| **Schwartz (2012)** | the Schwartz Value Survey and the Portrait Values Questionnaire illustrate findings from 82 countries, based on these and other methods, provide evidence for the validity of the theory across cultures | • 10 basic values across cultures are identified.<br>• Interdependencies and conflict between values illustrate the critical elements that create differences in culture |

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| **Spencer-Oatey (2012)** | A compilation of quotations from researchers about culture | • Comparison between many definitions of culture and the elements included in each one.<br>• Set a start for the complexity of the concept and how the holistic term is dynamic and has varying perspectives. |
| **Van Marrewijk (2007)** | 85 Biological interviews were carried out with previous members of management from Environ Mega project focused on the development of culture through the project lifecycle | • The research findings suggest the need for project managers and project-performing organizations to reflect on the development of the project culture during the project life cycle. |
| **(Zhou et al, 2022)** | A questionnaire accompanied with a literature review, of a sample collected from China. From employees who work on international projects. A pilot investigation was incorporated to validate the questions asked, | • Combining the results of the analytical data, this study gave an in-depth discussion and provided an overall framework promotion strategy to improve the effectiveness of knowledge transfer among members of cross-cultural teams. |

## Appendix A-2 Hofstede Dimensions

*Table 19- Hofstede's cultural dimensions and their definition.*

| Dimension | Definition |
|---|---|
| **Power Distance Index (PDI)** | The power distance index is defined as the degree to which members of groups and institutions who are less powerful accept and anticipate that power is not allocated fairly (Hofstede, 2001). The Power Index is lower in countries where figures with power work closely with their subordinates, and the PDI is much higher in places with a strong hierarchical structure (Kenton, 2022). |
| **Individualism Vs Collectivism (IDV)** | Individualism is a society that contains loose ties between individuals; everyone is expected to look after themselves and their immediate family only (Hofstede, 2001). Collectivism is a society that promotes strong in-groups from birth onward (Hofstede, 2001). |
| **Masculinity Vs Femininity (MAS)** | In this dimension, masculinity is defined as a preference in society for achievement, heroism, assertiveness, and material rewards for success (Hofstede, 2001). Masculinity comes with distinct gender roles, assertiveness, and an immense concentration on material achievements and wealth-building. On the other hand, femininity represents a preference for cooperation, modesty, caring for the weak, and quality of life (Hofstede, 2001). Femininity leans more towards fluid gender roles, modesty, and focus on quality. |
| **Uncertainty Avoidance (UAI)** | The index measures the extent to which individuals of a culture feel threatened by ambiguous or unknown |

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| | situations (Hofstede, 2001). The focus is the attitude people have to the unknown future and unpredictable events. The ambiguity brings anxiety into the equation, and different cultures have learned to deal with this anxiety differently (Hofstede, 2001). |
| **Long- Term Orientation Vs Short Term Orientation (LTO)** | Long-term orientation illustrates the delaying of instant gratification to develop long-term success (Hofstede, 2001). Long-term orientation reflects persistence, perseverance, and growth (Hofstede, 2001) |
| **Indulgence Vs Restraint (IND)** | This dimension is related to the gratification versus control of basic human desires related to enjoying life (Hofstede, 2001). Indulgence is defined as the liberty of fulfilling human desires related to enjoying life and having fun. On the other hand, restraint is the control of these gratifications and regulations through strict societal norms. |

# Appendix B-1 Interview Protocol

**Briefing**

My research focuses on the incorporation of cultural awareness to improve collaboration in EPC projects.

Specifically, I aim to understand the role that culture plays in projects and whether it can be improved to enhance collaboration and performance in project delivery.

The interview will focus on questions related to defining cultural awareness, current practices or procedures related to cultural cohesion, trends in the industry about intercultural collaboration, and suggestions for improvement. The focus of the interview will be on the project you are currently working on (Insert Project name).

Do you have any questions before we start?

Do you consent to have this interview recorded: This will only be used for research purposes to gather information.

**Basic Questions:**

1. So, what is your experience in the EPC industry? example roles and years
2. What is your role in your project [Insert Project Name]

**Defining Culture**

3. When the word culture comes up, how do you define it in terms of project delivery?

**Current Levels of cultural awareness in Projects**

4.
    a. How would you describe the current cultural diversity in your current project [ Insert Project name]?
    b. Does this have any implications on project performance and collaboration? (Use example based on mirroring answers from interviewee to increase conversation flow)
5.
    a. Can you share any examples of challenges or issues that arose due to cultural differences in {Insert Project Name}?
    b. Do you think cultural awareness could improve these conditions? Expand on your answer.
6.
    a. How is cultural awareness considered in your current project [Insert Project Name}?
    b. If so, what techniques or tools have been implemented?

**Improving current conditions**

7. On your current project, what strategies (that you have seen earlier in your career) could be implemented to improve cultural cohesion?

**Cultural Awareness tools**

8.

a. Have you heard of a tool called “Globe smart”? Elaborate
b. Explain Fluor’s strategy to implement this. (Based on an email from global support). Do you think this can improve collaboration on your current project? How so?

## Appendix B-2 Reflection after each interview

*Table 20- Personal reflection after interviews.*

| Interview Number | Reflection statement |
|---|---|
| **1** | This was an interesting discussion. I noticed early on that using the word culture in later questions was a bit misleading, so I chose to describe the question using different words. It was quite interesting to see the project management approach of using open communication and transparency. The main insight was that conflict between organizations was predominant to national differences. And the idea that research is looking for connections where there are none. This got us in a bit of a debate at the end that this is an explorative interview, and I am not looking for results, etc. After a bit of discussion, some relationships were developed. In essence, individuality presided over collective ideas in this interviewee’s opinion. |
| **2** | A very interesting meeting, it took me a minute to find the interview as this interview took place in the food court at Fluor. After a brief introduction, it was very interesting to learn about the diverse experiences and national experiences. I learned a lot, I also learned that time facilitates interaction and work with team members. It was also interesting to learn about the positive and negative impacts of different cultures. |
| **3** | The interview initiated with a conversation; this interview was very interesting as it conveyed how people feel about certain stereotypes. In essence, the boundary between a stereotype and an individual expression is very thin, and sometimes some people don’t want their emotions to be dismissed as being a national, or disciplinary trait. |
| **4** | This interview surprised me the most due to the level of detail expressed on this project. The meeting took place in the project team room which enabled the possibility of witnessing the project environment and all the ornaments hanging on the wall. The interviewee used the images to express the methods used as well as the difficulties. The DISC tool with many team members was shown, as the Globe smart tool as well as surveys. The interviewee was very eager to learn and mentioned that anything that could help would be exciting to try. |

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| **5** | This interview was my last one, it was interesting because I walked in much more confidently and posed in comparison to my first interview. The first question from the participant was about the results, or if I had found any results so far, I advised discussing this following the interview to prevent any biases in the response. The interview illustrated interesting insights into the workshare at Fluor, and how to address communication between offices. Also, the interview concluded with a desire to have a set of tools that may be used to stimulate cultural awareness. This was quite important to ensure that a solution or guide should incorporate this request. |
| **6** | This interview was interesting in terms of organizational culture and national culture. A great example of working in the middle east was shared where there was distrust among the client team which resulted in a failed project. This was evidence for the idea that cultural awareness was needed in Projects. Furthermore, technical competency was important to build a relationship with the client, so trust related to the ability to get the job done. |
| **7** | This participant was based in the UK, so the interview was undertaken online. The collaboration between the Manila and Farnborough offices was discussed, mainly regarding the virtual work-share environment. Furthermore, the DISC tool was discussed and expressed as a great tool to know others as well as oneself. Therefore, it expressed a reflective element that enhanced project performance in the participant's opinion. |
| **8** | This meeting took place in a coffee place, which eased the border between a formal interview and a comfortable environment. Key national differences between Southern Europe and Northern Europe were discussed, relating to the events that were convenient for the target audience. Another key dynamic was the identification of culture as an evolving concept, where an individual changes as time passes. |
| **9** | This interview was taken online due to the participant's availability. The concept of fit-for-purpose was explored and how tools are not the solution, but a facilitator to engage with the end goal in mind. Misalignment between project team members on the standard was seen to be a source of conflict at times. |
| **10** | This interview was interesting because the participant was enthusiastic about learning about the tools Fluor has available for raising cultural awareness. Discussion of the project lifecycle and the type of pressure in each phase was discussed along with the methods of team building. Furthermore, the participant's career path evolved through the project life cycle which reflected the condition of EPC projects. |
| **11** | This interview was quite extensive in the introduction. I felt like some counterparts were interested in me and what I was doing |

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| | before starting the interview. After getting the introduction it was interesting to see what it was like to work on an assignment in Amsterdam. National cultural differences were discussed as well as the customs that were new to learn. Furthermore, from a project execution point of view, the handover from the project was interesting to learn how some information is not transferred to new participants of the project team. |
| **12** | This interview was quite difficult in gaining detailed responses. It was also quite interesting because the interviewee had many years of experience and mentioned the shift on-site from predominantly Dutch in the past into a diverse workplace. But most responses were "fine" "cannot complain" or "we have a good team". Which although was insightful, it took a lot of digging to understand the reason behind the answers. However, I think it reflected the perception of the interviewee of the construction phase well. |
| **13** | It was interesting to get the construction phase from the point of view. Project C was the only project deep in the construction phase, which was interesting to gain insights from working on site. A common agreement on respect arose through our discussion with a comprehensive agreement that understanding each other's cultural differences facilitates our respect for one another. |
| **14** | This interview was conducted online due to the participants' availability but offered very detailed insights on the selection of team members. It was quite interesting to learn that the location of expertise impacted the project manager's decision to allocate someone in charge. Furthermore, integration into the team requires understanding the softer elements of the person and how they would integrate into the overall team. |
| **15** | I was quite intimidated before this interview because this was my first interview. In the beginning, I jumped straight into it, and my counterpart wanted more time to get to know who I am. I will make sure next time to be a bit calmer. Also, timewise, since this was my first interview, I was worried it would last too long, but it was not that short. I noticed my last question could be delivered a bit better, and not to use the word culture a lot because it can get a bit confusing. Overall, this interview had interesting results from an Indian workshare perspective from a younger colleague. |
| **16** | I enjoyed this interview because it conveyed a very important perspective on how national culture does not necessarily unite individuals as one would think. An important example of how two individuals from the same country were not able to work with one another, while completely different national cultures worked well with one another. Therefore, having the same national culture does not translate to working well with one another. |
| **17** | This interview highlighted many important aspects of project execution. Perhaps what surprised me the most was the passion |

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| | this participant had for undertaking projects. The physical environment was discussed thoroughly as well as the cultural shift between generations and how those impacts working in a team. Furthermore, unique cultural awareness methods were discussed, which conveyed the idea that it's not necessarily the task itself, but the interaction stimulated by doing it. |
| **18** | This was quite an interesting interview due to the participants' national culture in comparison with the rest of the team. Furthermore, the openness to discussing culture was quite interesting. The role of the project manager as an intermediary in solving conflicts between cultures was prioritized. In addition, an intimate example of how informal relationships due to a natural disaster in the participant's country was shown to comfort her and lead to more productive work in the following months. |
| **19** | This participant's perception of cultural awareness added a layer that I had not previously anticipated. There was a large emphasis placed on experience and transmitting an authentic meaning behind interactions. In other words, the method of cultural awareness is only useful if the team members involved are interested in learning about one another. |
| **20** | The intensity of working in the construction phase was strongly emphasized in this interview. A key takeaway I remember is that one must respect the culture he visits without demeaning it. Meaning if you cannot handle the customs of the place you are working in, you should leave. Furthermore, the educational differences in working on site were highlighted, meaning different stakeholders are involved. |
| **21** | This interview was interesting in understanding the impact of culture on negotiation and team working procedures. The procurement industry was discussed to incorporate a multi-cultural team that acts differently in ways of working. Furthermore, the importance of cultural awareness was identified through the need for a diverse team to optimize cost savings. |