PATH-GOAL LEADERSHIP MEDIATION MODEL TO INVESTIGATE THE IMPACT OF CROSS-CULTURE ON PROJECT TEAM EFFECTIVENESS IN THE NIGERIAN OIL AND GAS INDUSTRY

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Approval of the Thesis

PATH-GOAL LEADERSHIP MEDIATION MODEL TO INVESTIGATE THE IMPACT OF CROSS-CULTURE ON PROJECT TEAM EFFECTIVENESS IN THE NIGERIAN OIL AND GAS INDUSTRY

This Thesis by Oghenethoja Monday Umuteme has been approved by the committee members below, who recommend it be accepted by the faculty of Unicaf University in Zambia in partial fulfillment of requirements for the degree of

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Abstract

PATH-GOAL LEADERSHIP MEDIATION MODEL TO INVESTIGATE THE IMPACT OF CROSS-CULTURE ON PROJECT TEAM EFFECTIVENESS IN THE NIGERIAN OIL AND GAS INDUSTRY

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This study was conducted in Nigeria with participants from the oil and gas industry to address a research gap pertaining to project delays and failures. It aimed to enhance collaboration between project leaders and team members by investigating factors influencing project team performance. The study underscored the importance of comprehending the interaction among cross-cultural aspects, leadership behaviour, organizational culture, and team effectiveness within project teams.

Utilizing a quantitative research approach, the study employed structural equation modeling to develop a leadership model. Field data analysis employed statistical techniques including descriptive statistics, regression, correlation, path coefficient analysis, and model fit analysis. To ensure objectivity, participants were chosen through a blind selection process conducted by gatekeepers, and inclusion criteria validity was confirmed via the survey instrument. Three active project sites were deliberately sampled, being the only ongoing projects during the study.

While the primary thesis posited that project leadership mediates the connection between cross-cultural dimensions and team effectiveness, moderated by organizational culture, a posteriori findings mostly supported this, though with limited evidence of organizational culture's moderating effect. The study highlighted distinctiveness between cross-culture and organizational

culture as cultural constructs. It investigated team members' readiness to embrace various cross-cultural dimensions, particularly low uncertainty avoidance and long-term orientation.

This research emphasized the significance of multidisciplinary skills, motivational leadership, team size, knowledge sharing, and adaptability. Addressing criticism of the Path-Goal theory, which implies follower dependence through supportive leadership, the study countered with evidence of a robust socializing process. It provided insights into effective team composition and identified potential avenues for future research. The study's findings contribute to enhancing the performance of project team and promoting better collaboration between project leaders and team members.

Keywords: Leadership Mediation; Project Team Effectiveness; Organizational Culture; Cross-Cultural Dimensions; Structural Equation Modelling

Declaration

I declare that the thesis has been composed by myself and that the work has not been submitted for any other degree or professional qualification. I confirm that the work submitted is my own, except where work which has formed part of jointly-authored publications has been included. My contribution and those of the other authors to this work are explicitly indicated below. I confirm that appropriate credit has been given within this thesis where reference has been made to the work of others. Parts of this work have been published in:

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Author Contributions: **Oghenethoja M. Umuteme** played a significant role in the conceptualization of the study, literature review, methodology, study design, validation, software smulations and analysis, the creation of the original draft and editing of the writing.

Waliu M. Adegbite contributed to the literature review, methodology, study design, and provided valuable input for the review and editing of the writing**.**

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Dedication

I dedicate this work to God through Jesus Christ, the source of all wisdom and guidance. I offer my heartfelt gratitude to You for Your unending love and support throughout this journey.

And

To my dearest wife, Pastor (Mrs.) Adokiye Obele Umuteme (*PhD – in view*), for your faith in me and providing the initial spark that ignited the flame that led to the pursuit of this PhD. Your unwavering faith, encouragement, and prayers have propelled me forward, even in the face of challenges.

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List of Abbreviations

AVE	Average Variance Extracted
CB-SEM	Covariance Based - Structural Equation Model
CCD	Cross-Cultural Dimensions
CCI	Cross-Cultural Individualism/Collectivism
CCL	Cross-Cultural Long-Term Orientation
CCP	Cross-Cultural Power Distance
CCU	Cross-Cultural Uncertainty avoidance
CEOs,	Chief Executive Officers
CI	Confidence Interval
CSR	Corporate Social Responsibility
CVF	Competing Values Framework
EEFs	Enterprise Environmental Factors
EI	Expected Influence
GDP	Gross Domestic Product
GRPI	Goals, Roles, Procedures and Interpersonal relationships,
HND	Higher National Diploma
HTMT	Heterotraitmonotrait Ratio
IPM	Importance-Performance Map
KPI	Key Performance Indicator
LA	Leadership Approach
LAA	Leadership Approach - Achievement oriented

LAD	Leadership Approach - Directive
LAP	Leadership Approach - Participative
LAS	Leadership Approach - Supportive
LBDQ	Leader Behaviour Description Questionnaire
LNG	Liquefied Natural Gas
LPC	Least Preferred Co-worker
LTQ	Leadership Traits Questionnaire
MBE	Management By Exception
MLQ	Multifactor Leadership Questionnaire
NES	Nigerian Economic Summit
NGMP	Nigerian Gas Master Plan
NNOC	Nigerian National Oil Corporation
NNPC	Nigerian National Petroleum Corporation
OC	Organizational Culture
OCA	Organizational Culture - Adaptability
OCB	Organizational Citizenship Behaviour
OCC	Organizational Culture - Consistency
OCI	Organizational Culture - Involvement
OCM	Organizational Culture - Mission
P-G	Path-Goal
P-M	Planning and Maintenance
PD	Power Distance
PLS	Partial Least Square

PLS-SEM	Partial Least Square - Structural Equation Model
PMI	Project Management Institute
PRG	Partial Risk Guarantee
PTDF	Petroleum Technology Development Fund
PTE	Project Team Effectiveness
PTEG	Project Team Effectiveness - Group experience
PTEP	Project Team Effectiveness - Productive output
PTES	Project Team Effectiveness - Socializing process
SEM	Structural Equation Model
UA	Uncertainty Avoidance
VIF	Variance Inflator Factor

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CHAPTER 1: INTRODUCTION

Historically, Nigeria's oil and gas industry has been plagued by a lack of transparency and accountability, leading to corruption and mismanagement of resources (Bello, 2017). Consequently, the broader context of the problem in the Nigerian oil and gas industry can be said to encompass a multifaceted landscape marked by historical, economic, technological, and socio-cultural dimensions. This has led to a situation where the benefits of the industry have not been fully realized by the Nigerian people (Oluyemi, 2020).

The industry came into existence in 1956 after the first economically viable successful oil well was drilled at Oloibiri town in Bayelsa State, Nigeria (NNPC, 2020a). The discovery and subsequent exploitation of oil resources in Nigeria have had a profound impact on the country's economy and development. Oil has become the backbone of Nigeria's economy, accounting for a significant portion of its export earnings and government revenue. The establishment of the Nigerian National Oil Corporation (NNOC), later renamed the Nigerian National Petroleum Corporation (NNPC), was a crucial step in managing and regulating the oil and gas sector, including overseeing and funding of mega projects in the industry.

One of the notable transformations mentioned is the increase in the number of oil and gas wells through exploration and production activities. Over the years, Nigeria has discovered and developed numerous oil fields, both onshore and offshore, contributing to its status as one of the major oil-producing countries in Africa. This expansion has not only boosted the industry but also presented challenges in terms of environmental sustainability, community relations, and ensuring equitable distribution of wealth. The application of cutting-edge information management technology has also played a significant role in the industry's transformation. As technology has advanced, the oil and gas sector in Nigeria has embraced various digital solutions to enhance

operational efficiency, optimize production, and improve safety standards. By leveraging modern technologies, oil and gas companies have been able to make more informed decisions, reduce downtime, and streamline operations.

Furthermore, the construction of oil and gas processing plants and transportation facilities has been instrumental in the industry's growth. Nigeria has invested in building refineries, liquefied natural gas (LNG) plants, and pipeline networks to process and transport oil and gas resources. These infrastructure developments have aimed to meet domestic energy needs, reduce dependence on imported petroleum products, and facilitate exports. However, it is important to note that despite the significant transformations in the Nigerian oil and gas industry, there are still issues that need to be addressed. These include concerns over environmental degradation, oil theft, corruption, inadequate infrastructure maintenance, and the need for economic diversification. Since the inception of the Nigerian petroleum industry, it has experienced huge transformations in the number of oil and gas wells through exploration and production, application of cutting-edge information management technology, and construction projects of oil and gas processing plants and transportation facilities. These activities in the oil and gas industry are achieved through “time-driven” projects (El-Reedy, 2016).

Timely completion of these projects can save millions of dollars daily because the production of oil and gas are measured as barrels of oil per day or millions of standard cubic feet of gas per day. Implying that delays in projects can lead to cost-overrun (Aibinu & Jagboro, 2002; Al-Momani, 2000; Assaf & Al-Hejji, 2006; Seddeeq et al., 2019), where the final cost of the project significantly outweighs the initial estimated cost. Oil and gas production operations involve complex processes, including exploration, drilling, extraction, transportation, and refining. Each step requires meticulous planning, coordination, and execution to ensure smooth operations and

minimize downtime. Delays in project completion can lead to several adverse effects, and has shown to be significantly related to organizational culture (Arditi et al., 2017). First and foremost, any time lost in the production process directly translates into lost revenue. When a project is not completed on time, the production of oil and gas is hindered, resulting in a decrease in daily output. This reduction in output can have a substantial financial impact, considering the high market value of oil and gas commodities.

Moreover, delays can also result in additional costs. The fossil energy industry operates with a range of fixed and variable expenses, such as equipment maintenance, labour, transportation, and regulatory compliance. These costs continue to accrue regardless of the project's progress. Therefore, any delays prolong the time during which expenses accumulate without corresponding revenue, adding to the financial burden.

Furthermore, there are often contractual obligations associated with oil and gas projects. Companies may have agreements with buyers or investors that specify production volumes and delivery timelines. Failure to meet these contractual commitments can result in penalties, legal disputes, and damage to the company's reputation. By completing projects on time, companies can fulfill their obligations, maintain strong business relationships, and safeguard their market position. With increasing uncertainties in the global oil and gas business landscape, the driving philosophy behind oil and gas related projects determines the approach to project management (El-Reedy, 2016). Therefore, the focus of this doctoral work is to overcome project delays and failures in order to enhance the profitability of petroleum energy ventures in Nigeria, through the study of the cause-effect relationships among the concepts in the research construct.

Empirical evidence in the literature suggests that projects have failed due to many factors, including the non-motivation of the workforce (Discenza & Forman, 2007a). When it comes to

project failure, numerous factors can contribute to unsuccessful outcomes. The non-motivation of the workforce refers to a situation where the individuals involved in a project lack the drive, enthusiasm, or commitment to effectively carry out their assigned tasks and responsibilities. This lack of motivation can have a negative impact on project progress, team dynamics, and overall productivity. Projects require a motivated workforce to perform at their best, collaborate effectively, and meet project goals and deadlines. When employees lack motivation, they may display reduced productivity, decreased attention to detail, poor quality of work, and lower levels of commitment to project objectives. These factors can significantly hinder project success.

Also, the major factors leading to delays in projects (Ruqaishi & Bashir, 2015), can be linked to ineffective project teams. This is because project teams are comprised of interdisciplinary and multiskilled cross-cultural workforce (Kerzner, 2017). Similarly, empirical research evidence suggests that cross-cultural project teams are important in improving project performance because of the presence of diverse experiences, cultural values and beliefs, intellectual, physical, and socioeconomic status, and other personality characteristics that are shared during interpersonal interactions in the workplace (Jr et al., 2013; White & Lippitt, 1968). However, the performance of cross-cultural teams is highly dependent on the organizational culture instituted by the leadership (Jr et al., 2013). Cross-cultural teams are comprised of individuals from different cultural backgrounds, with diverse perspectives, values, and communication styles. While such diversity can bring numerous benefits, it can also present challenges in terms of effective collaboration and achieving team goals.

The organizational culture, established and nurtured by leadership, infleunces and shapes the dynamics of the team and overall performance. Implying, the variables of study - cross-culture, leadership, organizational culture, and the team effectiveness are theoretically interrelated. The

current industry of study presently experiences the shortage of talented and highly skilled indigenous workers (Ajayi, 2020). Though, the Nigerian government still provides overseas scholarship to improve the competitiveness of Nigerians in the industry (PTDF, 2020), the presence of multinational organizations in the industry and globalization will always create cross-cultural project teams in the industry.

Suggesting from above that project team effectiveness will have to be driven by cross-cultural dimensions and moderated by the dominant organizational culture in the organization. Cross-cultural dimensions have been researched and discussed extensively in the literature leading to the development of theories on the impact of cross-culture on organizational performance (e.g., Bitsani, 2013; Hofstede, 2011).

Likewise, team effectiveness studies have led to the development of theoretical and empirical models (e.g., Dinh & Salas, 2017; Ericksen & Dyer, 2004; Hackman, 2002; Kozlowski & Ilgen, 2006; Kozlowski, Mak, & Chao, 2016; Tuckman, 1965) that addresses the design of teams, competency development frameworks and team leadership (Kozlowski & Ilgen, 2006; Northouse, 2019). Team effectiveness is important in shaping the design of teams, the leadership dynamics within the team and competency of members of the team. When teams are designed with clear objectives, appropriate roles and responsibilities, and a diverse mix of skills and perspectives, it enhances the overall effectiveness of the team.

A task-depedent well-designed team considers the expertise of team members and the interdependencies between them. By carefully crafting the team composition, organizations can ensure that the right individuals are brought together, nurturing synergy and maximizing productivity. Furthermore, effective team design encourages collaboration, coordination, and effective communication among team members, leading to better outcomes. Competency of team

members is another critical aspect influenced by team effectiveness. A high-performing team comprises individuals who possess the necessary skills, knowledge, and experience to contribute effectively to the team's goals. Team effectiveness can drive the development and acquisition of these competencies through training, mentorship, and opportunities for professional growth. Additionally, an effective team creates an environment that encourages continuous learning and the sharing of best practices among team members. Leadership within the team is also shaped by team effectiveness. A strong team leader plays a pivotal role in establishing a clear vision, setting goals, and providing guidance and support to team members.

Team effectiveness influences the leader's ability to promote a positive team culture, inspire motivation, resolve conflicts, and empower team members to take ownership of their work. Effective leadership, in turn, enhances team cohesion, trust, and commitment, leading to improved performance and outcomesAgain, studies suggests that the adopted style of leadership in an organization can impact team effectiveness (e.g., Rego, Cunha, & Simpson, 2018). Also, the style of leadership is significantly and positively correlated with organizational culture as reported elsewhere (e.g., Littrell et al., 2018; Tsai, 2011).

Additionally, various leadership styles and characteristics of measurement exists in the literature (Northouse, 2019). But project leadership requires synchronous collaboration and communication (Kuster et al., 2011), and this demands that multiple leadership styles must exist concurrently in project teams. Leadership has always played a mediated role in leadership related research constructs (Northouse, 2019). Therefore, instead of the current authority-driven approach to leadership in construction projects (Newton, 2008), the need for a Path-Goal (P-G) leadership theory approach is advocated in this research as most suited for project team leadership because it

encourages a multi-style approach to leadership based on the need to link the characteristics of followers and the task to be accomplished (House, 1971; Northouse, 2019).

Also, in an earlier study conducted by Krahn & Hartment (2006), the most important skills/competencies of a project manager identified in the study are leadership to guide and motivate the team towards achieving project goals; relevant prior experience because it helps them understand the challenges and requirements specific to the project, enabling them to make informed decisions and anticipate potential issues; the ability to develop and mature detailed project plans, set goals that are realistic and time-bound, efficient allocation of both material and human reources, and monitor progress throughout the project lifecycle; people skills for building relationships, resolving conflicts, and fostering collaboration among team members and stakeholders; and strong verbal communication to convey ideas, instructions, and expectations to team members and stakeholders and team building skills for cohesive teams, promoting open communication, and facilitating effective collaboration among team members.

These project management skills are well suited to the Path-Goal leadership style as defined in the literature (Northouse, 2019). Hence, this research delves into examining the mediation effect of the P-G leadership style on the control of cross-cultural factors on team effectiveness in a cultural-dynamic project environment. Additionally, an exploration of how organizational culture moderates this impact will be undertaken to gain deeper insights into the interplay between cross-cultural dynamics within project teams and the prevailing organizational culture. Conducting such a study holds significance in evaluating the effectiveness of project teams upon project completion and generating valuable lessons for future projects. Remarkably, this research fills a void in existing literature, as no previous studies have explored this specific area.

Statement of the Problem

The implementation of the Nigerian Gas Master Plan (NGMP), approved on February 13, 2008 has undeniably brought about significant changes in the country's energy landscape., such as the Ajaokuta-Kaduna-Kano 614km natural gas pipeline project (NNPC, 2020b). The primary objectives of the NGMP were to bolster Nigeria's position as a competitive player in the global gas export market and to ensure energy security in the long-term. Over the years, the NGMP has spurred a surge in construction activities related to gas pipelines and stations, serving as a catalyst for Nigeria's gas sector growth. One of the most noteworthy outcomes of the NGMP has been the growth of the nation’s gas infrastructure. The construction of gas pipelines has facilitated the efficient transportation of gas across various regions, enabling better connectivity and accessibility. This infrastructure development has not only enhanced domestic gas supply but has also paved the way for increased gas exports, thus bolstering Nigeria's economic prospects on the global stage.

Moreover, the establishment of gas stations has played a crucial role in promoting the utilization of natural gas as a cleaner and more sustainable energy source. These stations have created new avenues for the consumption of gas, particularly in the transportation and industrial sectors. By diversifying the energy mix and reducing reliance on traditional fossil fuels, Nigeria has taken significant strides towards achieving its long-term energy security goals. However, while the NGMP has undoubtedly brought about positive changes, there are still challenges to overcome, including the timely delivery of construction projects that are direcly linked to gas availability.

In 2013, the World Bank granted a Partial Risk Guarantee (PRG) of $145 million to encourage Nigeria's gas sector, aiming to enhance electricity accessibility for the country's consumers (The World Bank, 2013). Hence, delays or failures of ongoing projects can impact the

projected Gross Domestic Product (GDP) of one billion dollars (ARISENEWS, 2023), with attendant negative impact on the economic sustainability of the country. Thus, one of the main goals of the Gas Industrialisation policy is to boost the nation's GDP by generating employment in various secondary industries spread across the country (NNPC, 2020b). However, the challenges faced by the industry have made it difficult to achieve this target, and there is a need for significant improvement in the transparency, accountability, and investment climate in the industry.

Culture in project management has been the subject of extensive research, as evidenced by approximately 100 published articles in selected journals spanning from 1989 to 2022 (Li, 2022). The breadth of this research demonstrates the ongoing interest and importance of understanding the interplay between culture and project management practice. However, the people factor leading to failure of projects or delays in project completion are not specifically reported in the literature (Mansfield et al., 1994; Ruqaishi & Bashir, 2015; Seddeeq et al., 2019; Thuyet et al., 2007), though inferences can be made on the possible influence of the project workforce on the causes of delays from the cited literature.

Yet, studies indicates that the dimensions of cross-culture influences the effectiveness of project teams (Fonceca et al., 2017; Hofstede, 2011; Suda, 2007). Also, projects are executed in accordance with the organizational culture (Suda, 2007), and the leadership must steer the team towards the successful delivery of projects in volatile environment through change initiation and change management (Krahn & Hartment, 2006). Implying, leadership plays a critical role in guiding teams to successfully deliver projects in a volatile environment. By proactively initiating and managing change, leaders adapt to the shifting landscape, communicate effectively, engage stakeholders, and promote a culture of continuous learning in ensuring project success amidst

project uncertainties. The concept of people-driven skills of project leadership refers to the abilities and qualities that project leaders possess in order to effectively manage and lead their teams.

These skills are focused on interpersonal relationships, communication, and motivation, as opposed to technical or task-oriented skills (Kumar, 2009), and are identified as crucial for project leaders. Project leaders need to motivate and inspire their team members to perform at their best. This involves creating a positive work environment, setting clear goals, and providing encouragement and recognition for achievements. By motivating and inspiring their followers, leaders can enhance team morale, engagement, and productivity. Also, project leaders should focus on building cohesive and high-performing teams (Atesmen, 2015). This involves understanding team dynamics, fostering collaboration, and creating a sense of unity among team members. Effective team building helps in improving communication, resolving conflicts, and leveraging the diverse skills and strengths of team member. Furthermore, pommunication is a vital skill for project leaders. They need to convey information clearly, concisely, and in a timely manner. Effective communication involves active listening, ensuring understanding, and adapting communication styles to suit different team members and stakeholders.

Clear communication promotes transparency, reduces misunderstandings, and enables effective decision-making. Again, project leaders must actively listen to their team members, stakeholders, and other relevant parties. By listening attentively, leaders can gain insights, understand concerns or suggestions, and show respect for diverse perspectives. Listening also helps in building trust and rapport with team members, facilitating open and honest communication. Lastly, project leaders often need to influence others to gain support for their ideas, decisions, or initiatives. This involves the ability to persuade, negotiate, and build consensus.

Effective influencing skills enable leaders to overcome resistance, manage conflicts, and drive positive change within the project team and the wider organization.

These characteristics are identified with the Path-Goal leadership approach in the literature (Northouse, 2019). Thus, the gap in the literature is the need for a Path-Goal leadership mediated model that can provide further insight and improve the knowledge of how the people factor can influence project delay and failure from a cross-cultural and team effectiveness perspective through the moderation by organizational culture. The people factor, which encompasses the behaviours, attitudes, and interactions of individuals within a project team, plays a crucial role in project success or failure.

However, the impact of the people factor on projects is complex, particularly in cross-cultural contexts where diverse cultural backgrounds, values, and communication styles can affect team dynamics and project outcomes. The Path-Goal leadership theory, developed by Robert House, focuses on the relationship between leaders, followers, and the achievement of goals (House, 1971). It emphasizes the leader's role in guiding and supporting team members to attain objectives by providing direction, clarifying expectations, removing obstacles, and offering rewards. By incorporating this theory into a mediated model, researchers can explore how different leadership styles, specifically those aligned with the Path-Goal framework, can influence team effectiveness in various cultural settings. Furthermore, the study has emphasised the importance of considering the moderating effect of organizational culture.

Organizational culture can significantly impact how individuals perceive and respond to leadership styles and team dynamics through the influence of shared values, beliefs, and practices within the organization. By examining the interaction between leadership, team effectiveness, and organizational culture, researchers can gain a more comprehensive understanding of how these

factors collectively contribute to project success or failure. Addressing this literature gap can have practical implications for project managers, leaders, and organizations. By understanding the impact of the people factor on the outcome of a project and how it is influenced by cross-cultural dynamics and organizational culture, leaders can adapt their leadership styles, communication strategies, and team-building approaches to promote better project performance.

Thus, the lack of explicit research on the influence of the people factor, particularly within cross-cultural contexts, on the causes of project delays and failures presents a significant gap in the existing literature. This study aims to bridge this gap by developing a mediated model based on the Path-Goal leadership theory to explore how different leadership styles, in conjunction with organizational culture, can moderate the association between the people factor and project success or failure. The model will investigate the intricate interplay between leadership, team effectiveness, cross-cultural dynamics, and organizational culture to provide valuable insights for project managers and leaders, enabling them to enhance project performance by tailoring their approaches to the unique characteristics of their teams and contexts.

Purpose of the Study, Research Aims, and Objectives

The purpose of this research is to address the gap in the literature identified earlier to improve on existing team effectiveness models by incorporating cross-culture (variable 1 –predictor), team effectiveness (variable 2 – outcome), Path-Goal leadership (variable 3 - mediator) and organizational culture (variable 4 - moderator) in single research construct. As a result, it explores: (1) The direct link between the measured dimensions of cross-cultural and project team effectiveness through structural equation modelling (SEM); (2) How project leadership mediates the relationship in objective (1); (3) The moderation by the dominant organizational culture on the

leadership mediation effect of the first causal relationship above, and (4) How organizational culture moderates the relationship in objective (1), above.

In order to accomplish the objectives of this research, a quantitative research approach was adopted.. By employing structural equation modeling (SEM), this research aim to analyze the relationships between variables and test theoretical models in a systematic and rigorous manner. SEM analysis allows for the investigation of complex interactions among variables, and provides detailed understanding of the underlying constructs and their interconnections. Through the application of SEM, the current research seeks to gain valuable insights and draw meaningful conclusions based on empirical data from the field survey as detailed later in chapter 3 and 4. The study was conducted cross-sectionally with a closed-ended Linkert scale questionnaire survey data collection tool, and administered to 230 participants through a blind selection process conducted by gatekeepers because of the specific inclusion and exclusion criteria. The included questions in the questionnaire are ordered based on the ontological dimensions of the four concepts in the research construct.

This research seeks to prioritize leadership behaviours based on their impact in improving team effectiveness and addressing project delays and failures in a cross-cultural project environement. The aim is to identify and highlight the most influential leadership behaviours in projects within the industry of study. This will close the gap in the literature identified before by developing a comprehensive research construct that integrates cross-cultural aspects, leadership, organizational culture, and team effectiveness. By doing so, the study will enhance existing project team effectiveness models. The processes adopted to achieve the objectives included: (1) Identifying and operationalizing the measurable variables of the four constructs investigated; (2) Conducting the field investigation using a survey questionnaire; and (3) Creating a structural

equation model (SEM) for examining the constructs outlined in the theoretical framework. Therefore, the objectives of this research were as follows: (1) Investigate the causal link between the cross-cultural dimensions and project team effectiveness dimensions from the SEM; (2) Investigate how the P-G project leadership dimensions mediated the association in the first objective; and (3) Investigate how the organizational culture dimensions moderated the influence of cross-culture in the second objective.

From the SEM developed, the investigation in the first objective measured the specific effect cross-culture dimensions on the dimensional variables of project team effectiveness, providing insights into how cultural factors influenced team performance. This investigation provided further insight into the dynamics between the dimensional variables of cross-culture and project success in the studied industry.

The second objective investigating the mediation of the dimensional variables of P-G project leadership was fundamental to providing further understanding of the relationship in the fourth objective. By examining this mediation effect, the study provided insights into how the dimensions of project leadership influenced the association between cross-culture and team effectiveness. This knowledge enabled us to identify the mechanisms through which effective project leadership impacted outcomes, such as team performance and project success. Understanding these mediating processes allowed us to optimize project leadership strategies and enhance overall project effectiveness. Furthermore, by uncovering the mediating role, we could develop targeted interventions and training programs to develop leaders who could effectively navigate and mediate the complexities of project management, leading to improved project outcomes.

The third objective improved the understanding in the first and second objectives by studying the moderation by organizational culture on the research construct. Studying the moderating role of organizational culture on the research construct was important as it helped us understand how the impact of the construct on the cause-effect association between cross-cultural dimensions and P-G leadership behaviour, and with the effectiveness of the team. If the moderating influence existed, this knowledge allowed project owners to tailor interventions and strategies that aligned with specific cross-cultural and organizational cultural contexts. This alignment led to more effective implementation and positive outcomes.

Nature and Significance of the Study

Culture in projects continued to attract considerable research efforts, with about 100 published articles in some selected journals from 1989 to 2022 (Li, 2022). This research adopted a quantitative research approach. Survey data collection method was administered cross-sectionally to between 200-300 participants based on a population size of 600-900 project team members. The questionnaire featured a multi-section questionnaire determined by the four concepts. Also, the analysis of data was achieved through the application of descriptive statistics, network analysis, and structural equation modeling (SEM). Details of the participants, method, collection of data, and analysis of data are discussed further as follows.

Participants

A minimum of 200 workers who were 30 to 60 years of age were recruited with a blind selection process conducted by gatekeepers for this study, because of the inclusion criteria and the difficulty of accessing the actual number of project workers in the industry of study. The main inclusion criterion was that participants must have had at least one year of experience in project activities in the oil and gas industry. Those with less than one year of experience in petroleum

related project activities were not included, to ensure the participants had adequate experience to understand project dynamics. This decision was also influenced by the fact that most organizations have a one-year probation policy for new employees. Participants were identified and briefed prior to the interview in line with research ethical requirements. This research was carried out in the cities of Lagos, Port Harcourt, and Warri, where the activities of petroleum multinationals are predominant in Nigeria. This research was guided by the research ethical codes and procedures of the Unicaf University in Zambia on the recruitment of participants. Going forward, "oil and gas industry" or simply "the industry" will be used interchangeably.

Methods

This investigation assumed a positivist epistemological philosophy. The study was positivist in nature because it used deductive reasoning and quantitative techniques to provide further understanding of the causal relationships in the research construct (Creswell, 2009; Easterby-Smith et al., 2015; Saunders et al., 2019; Sekaran & Bougie, 2016). Again, the research gap and study hypotheses were generated from an extensive literature review relevant to the study.

The reasoning behind adopting a descriptive quantitative method was based on the specific characteristics of this study, because of the exclusive features of the quantitative research approach outlined in the literature (Creswell, 2009; Easterby-Smith et al., 2015; Saunders et al., 2019; Sekaran & Bougie, 2016). These features were as follows: (i) the development of cause-effect hypotheses; (ii) numerical data collection, analysis and interpretation; (iii) the use of a statistical analytical approach in testing the hypotheses; and (iv) the development of theories and models from the findings with accurate statistical evidence. Also, cross-sectionally closed-ended survey questionnaires was adopted and administered to 230 participants to fulfill the objectives set earlier.

Data Collection Tool

Data collection in a quantitative study was accomplished, as discussed in Saunders et al (2019) as follows: (i) the manipulation of experimental variables to produce results that were time-dependent; (ii) structured observation of the behavior of participants under a defined setting in the workplace; (iii) secondary data that investigated relationships among variables using existing data; and (iv) a survey when a large number of participants were required in the study without longitudinal time-dependent observation of variables. Consequently, the data collection in this investigation was only favored by the fourth approach because of the unique construct involving the concepts of the proposed study. The goal was to retrieve a large number of responses from participants using ordered scale measurement questions from the operationalized dimensions of the four concepts (latent variables) in the research construct to enhance objectivity and generalizability.

Since the average size of project teams in the industry was between 600-900 team members, the actual data required for the statistical analysis was between 200-300 participants representing one-third of the specific project team population range. Fifty extra questionnaires were included to minimize "a no-response" error. However, evidence in the literature suggests that a minimum of 160 carefully selected data is ideal for SEM (Memon et al., 2020).

Data Analysis

Two approaches adopted in the analysis of data include descriptive and multivariate statistical analysis. First, the adoption of descriptive statistics was to determine the mean of the sampling outcome and the resulting standard deviation. This provided insight into the variability and consistency of the responses. Secondly, the hypotheses were tested from the results of the SEM, which provided multivariate statistical analysis of regression and correlation. The SEM

factor analysis outcome was aimed at discovering the “high-rating factor(s)” dimensions of each concept in the construct, and path analysis for the suggested strength of the relationship in the SEM. Based on the theoretical framework developed for this study, the path analysis conducted provided insight into the contribution of the moderating effect of organizational culture and the mediating role of P-G leadership behaviour in the construct.

Finally, SEM model fit analysis was achieved using the indicators discussed in Hu and Bentler (1999), and widely used by researchers in SEM analysis. This statistical technique measured and analyzed the relationships of both measured and latent variables. The purpose of SEM was to enhance the accurate conceptualization of the theory under study (Rigdon, 2016). Through SEM, the regression and correlation among the variables were measured with ease and flexibility, while also providing measurement errors resulting from extraneous variables that were not measured but could potentially affect the results of the model.

Through path analysis, the patterns of the effect along the causal link between the latent variables were investigated and estimates of the magnitude and significance of hypothesized causal connections between the latent variables in the model were provided. Path analysis was achieved by treating each linked hypothesis separately. Two main SEM analyzing techniques are available in the literature: covariance-based SEM (CB-SEM) and Partial least square SEM (PLS-SEM) covariance-based SEM (CB-SEM). These SEM methods differ in application based on the assumptions on how the concepts are mapped to the conceptual models in statistical analysis. Both approaches have been discussed extensively in the extant literature (Hair et al., 2019, 2020; Liengaard et al., 2021; Nam et al., 2018; Sarstedt et al., 2016). Below, the details of their advantages, disadvantages and application and the basis for adopting PLS-SEM in this doctoral research will be discussed.

Partial Least Square SEM

To empirically represent the conceptual/latent variables in the construct, PLS-SEM used the total variance of the measured variables of each concept to develop regressed linear combinations of all measured variables, resulting in composite variables that could be correlated to the conceptual variable (Hair & Sarstedt, 2019). Hence, PLS-SEM only created composite proxies. Thus, as a variance-based estimator, PLS created a linear association of the measured indicators as from the theoretical concept and then evaluated their coefficients (Benitez et al., 2020). The use of PLS was favored when it was difficult to determine if the actual structure of the measured data was common-factor (reflective) or composite-based (formative) (Sarstedt et al., 2016). SmartPLS®, the software identified with the capability for PLS-SEM, was adopted in this research. There was ongoing interest in the study of the benefits and limitations of PLS, as indicated by the recent volume of literature on the subject.

Whereas some researchers supported the use of PLS (Hair, 2021; Rigdon et al., 2017), others disagreed, especially on its application in psychological research, arguing that the estimates and path-analysis results were biased because of the composite-based estimation of variances of the indicators (Antonakis et al., 2010). However, the choice of which SEM approach to use depended on the population characteristics from where the sample was drawn (Hair & Sarstedt, 2019; Rigdon, 2016; Rigdon et al., 2017). The benefits of PLS-SEM include: (i) capable of SEM analysis with small size of data in situations where a suitable large data is not obtainable and there is need for an exploratory study of the interlinked concepts; (ii) when it is not known if the indicators of the concept of study exhibited conditional multivariate normality for maximum likelihood estimates; and (iii) favourable in conditions when the latent variable is dependent on the measured data. One important aspect of PLS-SEM is maximizing correlation through a

composite weighting process (Rigdon, 2016). However, there were concerns with the use of the PLS path modelling approach, especially not accounting for measurement errors (Rigdon et al., 2017).

A recent updated argument in favour of PLS-SEM for confirmatory and explanatory purpose, indicates that arguments against the use of PLS is based on wrong research design where PLS have been used to provide estimates on a factor-based population (Benitez et al., 2020). In the current research, the effort was not to exhaustively measure all indicators of the concepts of study, but to provide a likelihood of the presence of the concept in the project team; hence, the numbers of indicators from the literature measured were assumed to have sufficiently defined the construct.

Covariance-Based SEM

CB-SEM are also known as factor-based models, and empirically represents the latent variables in the construct using common factors that have been derived from the common variance of their measured variables to provide insight into the covariance between each concept and their respective measured variables (Hair & Sarstedt, 2019). The software mostly used in this analysis is IBM/SPSS AMOS®. The main argument in favour of CB-SEM parameters estimates is that the discrepancy between the conceptualised empirical and model estimated variance–covariance matrix of the measured indicators is minimized through implied “measurement errors” (Benitez et al., 2020). Measurement errors accounts for the variable(s) not measured, but can influence the latent variable (Rigdon, 2016; Rigdon et al., 2017). Covariance-Based structural equation modelling (CB-SEM), is employed when the population normally distributed (Rigdon, 2016). The job tasks, size, performance measuring and leadership characterristics are difficult to aseess (El-

Reedy, 2016). Hence, adopting a CB-SEM can lead to wrong assumptions in modelling, regression and correlation outcomes that are unrealistic, and poor path analysis.

Adopted SEM Approach and Rationale

The PLS-SEM is adopted in this research for the following reasons. First, the presence of the concepts in the study is visualized from the perspective of ontology – which is the existent of the phenomenon of study as a reality based on the data retrieved from project team members and the leadership, implying that the deductive inference on the concepts is dependent on the observed data. Hence, the link between the predictor and moderator indicators and their concepts must be formative. Second, as an auditing model, it is necessary for the model to find application in smaller projects with less than 100 team members, which is possible by PLS modelling (Hair et al., 2010). Third, it is difficult to access if the concepts of study are normally distributed in the population of study, since the population size of all projects in thee industry is relatively unknown, hence PLS is also most suitable.

However, the participants in the survey have worked in various projects with an average project size of between 600-900 workers. For this range of population size, a sample size range of 234-278 is recommended in the literature (Sekaran & Bougie, 2016). A similar computation was obtained using Raosoft sample size calculation online software with a confidence interval at 95%, distribution response of 50% and 5% error margin (Raosoft, 2004). However, empirical evidence in the literature (Memon et al., 2020, p. 14), suggested that “160 and 300 valid observations is well suited for multivariate statistical analysis techniques.” From the arguments above, SmartPLS® SEM analysis software was adopted based on the assumptions and the specific need of this research (Ringle et al., 2015).

Significance of the Study

Studies in organizational performance indicates that the leadership style(s) determines the effectiveness and efficiency of the organization (Daft, 2012; Jones & George, 2016; Northouse, 2019). Since leadership influences the behaviour of followers (Northouse, 2019), and typical projects in the studied industry is comprised of multiple project teams, it is important to provide further insights into the significance of team effectiveness in organizational performance. In most cases, the project team is blamed for project delays and failures by the leadership. However, this study provides a framework for understanding what the leadership could have done differently to enhance of the team.

Overall, this research provide further insight into the significance of team effectiveness in construction projects, and how this significance is influenced by the high-rating dimensions of cross-culture in the team through the mediation of leadership and the moderation outcome of the the measured dimensions of organizational culture.

Research Questions and Research Hypotheses

Each research question (RQ) below is derived from the research construct consisting of four concepts: cross-cultural dimensions in project teams, project team effectiveness, leadership approach, and organizational culture, and are addressed in this study. These are stated as follows:

RQ1: What is the direct impact of cross-cultural dimensions in a project team on project team effectiveness in the oil and gas industry in Nigeria?

Typically, the oil and gas industry is characterized by a workforce from diverse cultural backgrounds, making it essential to understand and manage cultural differences to achieve successful project outcomes. By accepting the existence of the dimensions of cross-culture in projects, the leadership can promote healthier communication, collaboration, and collaboration

amongst team members from different cultural backgrounds. This can enable the team to leverage diverse perspectives, innovative ideas, and local knowledge, and able to improve effective problem-solving, decision-making processes and collaboration. Effective collaboration can improve the competence of the team and minimises direct supervision (Willcoxson & Millett, 2000). Understanding how cross-cultural dimensions directly impact team effectiveness allows project leaders to optimize the benefits of these dimensions.

RQ2: How does the moderating role of organizational culture influence the leadership-mediated impact of cross-cultural dimensions on both leadership behaviour and project team effectiveness?

This RQ is important in this research for the following reasons. Firstly, in today's globalized world, organizations are increasingly operating in diverse and multicultural environments. Understanding how cross-culture affects the effectiveness of project teams is fundamental for successful project management. Secondly, the role of leadership is pivotal in bridging cultural differences and maximizing team performance. Exploring how leadership can mediate the influence of cross-culture on the effectiveness of the team provides valuable insights for leaders and managers in multinational organizations, as discuused earlier. Thirdly, organizational culture acts as a contextual factor that can shape and influence leadership practices (Schein, 2004; Xenikou & Simosi, 2006). Investigating the organizational culture as a moderator helps to uncover the dynamics between team effectiveness, leadership and culture, and providing a deeper understanding of how these factors interact and impact project outcomes. Thus, by examining the interplay between cross-cultural dimensions, leadership, and organizational culture, this research question contributes to the development of effective strategies for managing diverse project teams and optimizing their performance in multicultural settings.

RQ3: How does the mediating influence of leadership style affect the link connecting cross-culture and project team effectiveness?

Haslam et al. (2011) suggests that the presence of a "mental state" among the workforce can influence how followers listen to their leaders. This mental state refers to the psychological and cognitive factors that shape an individual's receptiveness and interpretation of leadership messages. Factors such as the follower's mindset, beliefs, emotions, and prior experiences can significantly impact their perception and understanding of a leader's communication. A positive mental state, characterized by trust, openness, and engagement, can enhance followers' willingness to listen, understand, and act upon their leader's directives. Conversely, negative mental states like skepticism, resistance, or distraction can hinder effective communication and diminish the leader's influence. The project leader must recognize and address the prevailing mental state to effectively communicate and inspire project team members to achieve project and organizational goals.

Hypotheses

The above three core research questions are directly related to the hypotheses generated for this research as presented below. For simplicity, the concepts of study in, Cross-Cultural Dimensions, Organizational Culture, Project Team Effectiveness and Leadership Approach, are coded as CCD, OC, PTE and LA, respectively. Furthermore, eight hypotheses designated as H1, H2, H3, H4, H5, H6, H7 and H8, have been derived from the above theoretical framework. Hypotheses, H1, H2 and H3 are directly linked to the research questions. From a theoretical perspective, establishing relationships between the concepts of study is fundamental to SEM analysis. Hence, hypotheses, H4, H5, H6, H7, and H8, are further developed to articulate these relationships and provide a framework for testing and analysis within the SEM framework. Based

on the causal link between the CCD and PTE, hypothesis H1 investigates the theoretical position in Hofstede (2011) that CCD impacts PTE.

Furthermore, the effect of OC on the quality (cost, scope & time) of the project is also affected by CCD (Jetu & Riedl, 2013), which becomes the key performance indicator (KPI) for measuring PTE. Since the hypotheses are causal in nature and measures the impacts of the dimensions that are operationalized for the concepts in this study, two hypotheses are directly derived as follows:

(H0). There is no significant positive relationship between CCD and PTE.

(H1a). A significant positive relationship exists between CCD and PTE.

(H20). There is no significant moderating effect of OC on the direct positive relationship between CCD and PTE.

(H2a) - There is a significant positive moderating effect of OC on the direct positive relationship between CCD and PTE.

Also, the organizational leadership behaviour is a direct reflection of the dominant organizational culture (Schein, 2004). Again, Rego, Cunha, and Simpson (2016) suggests that organizational leadership directly impacts team effectiveness, such that there is a direct positive association between LA and OC (Littrell et al., 2018; Tsai, 2011).

Consequently, it can be argued that the leadership approach adopted in the management of project teams is expected to mediate the direct positive impact of CCD on PTE, in order to enrich the complementarity of the leadership-project team nexus (Forsyth, 2007, 2010; J. Hu & Judge, 2017). Furthermore, leadership styles and the scale for measuring their attributes exists in the literature (Northouse, 2019). However, collaboration and communication are achieved in a synchronous manner (Kuster et al., 2011), hence the need for concurrent multiple leadership styles

in projects. Implying that effective leadership requires the adoption multiple leadership behavious simultaneously. This is because, different team members may respond better to specific leadership approaches, such as detailed in the P-G leadership theory. Employing concurrent leadership styles enables leaders to adapt their approach depending on the situation and the needs of the team people chracateristics.

Hypotheses H3, H4, H5, and H6 stated below, suggest that the mediation by leadership is shaped by the moderation influence by the organizational culture. Certain cultural values, norms, or practices can enhance or diminish the effectiveness of leadership behaviours in achieving desired outcomes. By considering the interplay between leadership and organizational culture, project leaders can gain a deeper understanding of how leadership processes are influenced and shaped within a given organizational context.

(H30). There is no significant positive relationship between LA and PTE.

(H3a). There is a significant positive relationship between LA and PTE.

(H40). There is no significant positive relationship between CCD and LA.

(H4a). There is a significant positive relationship between CCD and LA.

(H50). There is no significant positive mediating effect of LA on the significant positive relationship between CCD on PTE.

(H5a). There is a significant positive mediating effect of LA on the significant positive relationship between CCD on PTE

(H60) – There is no significant positive moderating effect of OC on the LA mediated significant positive relationship between CCD and PTE.

(H6a) – There is a significant positive moderating effect of OC on the LA mediated significant positive relationship between CCD and PTE

Since the organizational culture is related to both the organizational leadership and team effectiveness, two more hypotheses are stated as follows:

(H70) - There is no significant positive relationship between OC and LA

(H7a) - There is a significant positive relationship between OC and LA.

(H80) - There is a significant positive relationship between OC and PTE.

(H8a) - There is a significant positive relationship between OC and PTE.

Thus, the main gap is the need to study the above complex cause-effect relationship among the concepts.

CHAPTER 2: LITERATURE

Generally, several factors determine the success of projects (Discenza & Forman, 2007b; El-Reedy, 2016; PMI, 2017). Thus, it is appropriate to outline these factors in the context of leadership, culture, and team effectiveness within the project environment. Leadership facilitates the decision-making process as a mediator between the team and the task to be achieved (Northouse, 2019). Also, the diversity in project teams calls for the need to investigate the effect of cross-cultural dimensions in projects. This research aims to examine how LA mediates the influence of CCD on PTE. Additionally, the research investigated the moderating effect of OC on the impact of CCD. The study employed a complex structural equation model (SEM) that incorporated four intertwined concepts: OC, CCD, PTE, and LA.

The objective was to develop a comprehensive model for evaluating project performance in relation to these factors. This chapter serves the purpose of reviewing the existing literature on the aforementioned four concepts and their relevance to the research objectives.

This review of literature explores previous studies and scholarly works that have investigated CCD, OC, LA, and PTE. By examining the existing research, the chapter aims to highlight the importance of these concepts and their interconnectedness in the context of project performance evaluation.

Specifically, this chapter: (a) discusses the adopted conceptual and theoretical framework in detail, (b) provides a historical overview of the psychology of leadership and theories, (c) reviews the literature on project leadership and the rationale for adopting the path-goal leadership approach, (d) reviews the literature on cross-culture, (e) reviews the literature on organizational culture, (f) reviews the literature on team effectiveness, and (g) provides the gap in the literature necessitating this study.

Theoretical/Conceptual Framework

Every research starts with an idea, which is usually an identified gap in the body of literature on a subject area and with the overall aim of providing answers to complex problems in business and society (Bordens & Abbott, 2018; Creswell, 2009). Once the research idea is identified, the research community must be convinced of the authenticity of the adopted research process in providing answers to the problem. This is the more reason why it is important to adopt a reliable and adequate theoretical position, as this also affects the research method. Udo-akang (2012) explained that the development and validation of a theory on a phenomenon of social or business importance are done to explain a problem, describe the uniqueness of the phenomenon of interest and provide a means to explain the causal relationships that exist between the concepts that defines the phenomenon. The views from four scholars are presented below, and how their understanding of what constitutes a good theory can explain the process of theory-building and validation.

Wacker (1998) explained that the definition of theory must fulfil four fundamental criteria: "conceptual definitions, domain limitations, relationship-building, and predictions" (p. 361). Implying that a theory about a phenomenon must clarify concepts and why they are needed to understand the phenomenon of study, the area of application and its limitation, the causal relationship among the concepts that explains the phenomenon and predictive capability. Another explanation of 'theory' is given by Whetten (1989). Whetten, suggests that a theory must provide answers to the following questions: (i) what are variables or concepts of concern? (ii) how are the variables or concepts related from a cause-and-effect perspective? (iii) why are the variables or concepts related to define the nature of the association from the field data?

Hence, a good theory must have the power to identify a relationship, explain the relationship and predict outcomes based on relationship among variables and concepts. To achieve these, Whetten suggests that a good theory must incorporate logical reasoning in

explaining the “cause and effect” relationship existing among the variables and concepts. Again, Sutton and Staw (1995) suggests that a good theory is ‘representational and verbal’ of the causal relationship among the concepts and the logical explanations on why the relationship(s) exist based on the collected and interpreted data. The understanding of what constitute a theory as explained in the cited literature above guided the identification of the relevant theories for this research work, with emphasis on the availability of validated instruments of measurement.

Research Theories and Justification

This research adopts the cross-culture theory, path-goal leadership theory, team effectiveness theory and organizational culture theory, in the development of a leadership mediation model to provide further insight into the association between CCD and PTE in the studied industry. Organizational leadership has been studied as early as 1927 (Northouse, 2019). Various theoretical approaches to leadership exist in the literature and have been discussed extensively in Northouse (2019). However, much of the discussions on leadership from the 1960s focused on leadership achievimng a common goal through a process of change or the ability of leaders to influence followers (Northouse, 2019). In this doctoral research, leadership is employed as a mediator with a moderating effect from the organizational culture.

This study adopted a working definition which suggests that leadership “is a major force that influences goals, the amount of involvement with and commitment to productivity, the amount of creativity in solving problems, and the degree of satisfaction from work” (Blake & Mouton 1981, p.440). This definition is suitable for this study because the influence of leadership on the achievement of the common goal is linked to productivity, creativity, problem solving and employees’ job satisfaction, which are important to project success. With concern for enhancing team effectiveness in projects, the need for project leadership behaviour(s) is obvious, and this will be discussed further.

Project leadership is relatively new and still under-investigated as literature search has indicated, even when the study of general leadership has span over a century. Therefore, this study is characterized as exploratory in its approach since it investigates project leadership as an evolving theory (Hair et al., 2019). Constructionactivities, especially in the petroleum industry, are composed of both multiskilled and interdisciplinary workforce (Kerzner, 2017). Hence, leadership behaviours in construction projects should align with the existing work culture of the 21st century (Lloyd-Walker & Walker, 2011).

Again, to ensure effective teamwork based on the varying cultural perspectives of individual employee from the background of globalization, project leadership must invest time and resources in activities that promotes team bonding (Jr et al., 2013; Kloppenborg, 2015). By grasping workplace social dynamics, a project leader can promote team cohesion, and strengthening the collaborative spirit within the workforce through effective understanding of socio-political relations (Zaccaro & Klimoski, 2001), to positively influence team effectiveness (Northouse, 2019; Rego et al., 2016). Empirical data indicates a positive correlation between effective people-oriented leadership skills and successful project delivery, emphasizing the significance of interpersonal abilities in project management (Krahn & Hartment, 2006).

In a paper presented at the Project Management Institute (PMI) in 2011 at Dallas, North America, Margules (2011) identified six leadership approaches encouraging exceptional project outcomes., including: (i) visionary leadership, to provide future-driven attainment of the common goal; (ii) affiliative leadership, for a more humane-oriented leadership that creates a harmonious work environment; (iii) participative leadership, to create and build the spirit of commitment and innovative creativity; (iv) leadership by coaching behaviour improve competencies within the team; (v) leadership by pacesetting behaviour enhance achievement-driven project outcomes; and (vi) leadership by providing directives, to enhance focus on the bottom line and project quality through regulatory policies, standards, and procedures.

In this section, the review will analyze leadership theory, focusing on cultural perspectives to improve team performance, comparing it with the six leadership behaviours outlined in Margules (2011). Previous research on project leadership explored the influence of transactional and transformational leadership (Aga, 2016; Grill et al., 2019; Keegan & Den Hartog, 2004), including authentic leadership (Alavi & Gill, 2017; Lau, 2017; Lloyd-Walker & Walker, 2011; Lyubovnikova et al., 2017; Toor & Ofori, 2008) on successful project outcomes. Suggesting that each of these leadership styles positively influences project performance based on the project size and scope.

Specifically, the reports indicates that: (1) larger and complex projects necessitate the adoption of transformational leadership behaviour to facilitate change efficiently, thus curtailing the resistance from the workforce during implementation; (2) in smaller projects, transactional leadership is suitable, as it prevents team burnout after working over prolonged durations, contrasting with larger projects where transformational leadership reduces workforce resistance during change implementation.; and (3) authentic leadership is suitable when there is the need to adopt all-inclusive leadership style, thus emphasizing the importance of genuine and comprehensive leadership qualities in such contexts.

Transformational leadership promotes knowledge sharing, creativity, self-motivation, innovation, enhances team members' self-esteem, self-efficacy, and competence, furthering a positive and productive work environment. However, critics believe that transformational leaders are visionaries with lesser input from their followers, hence not too different from traits leadership (Northouse, 2019).

Again, critics believe that transformational leaders see themselves as heroes who decide what their followers must do rather than encouraging shared leadership vision between the leader and the followers, hence not a practical leadership concept (Yukl, 1999, 2008). Also, this theory is somewhat vague in the application as the theory did not define a definite on the

course action that the leader should adopt when the project situation changes (Northouse, 2016). Hence, the leadership approach is reliant on the experience of the leader in similar projects. This form of leadership is not expected to last beyond two years, hence unfit for projects lasting beyond this period.

Furthermore, empirical findings indicate potential high multicollinearity among measurement instrument factors, signifying strong correlations among individual factors, challenging their uniqueness as distinct measures (Tejeda et al., 2001), and can be insensitive to the need for a change in leadership behaviour in response to project dynamics. Thus, suggesting the need for a leadership theory where a distinct leadership style can be applied in unique situations, or the adoption of two or more interwoven leadership behaviours to address the contingency demands of project teams.

Transactional leadership remains emotionally detached from the workers due to its contractual nature, emphasizing monetary exchanges via management by exception (MBE) and contingent rewards, lacking a personal or emotional connection with individuals (Northouse, 2019). Especially, the passive MBE leadership behaviour can lead to delay in proactive leadership intervention when performance is low. The top-down approach of the transactional leader does not make it fit for project leadership where the expertise of the team members is needed to complete the task. However, there is an emphasis to adopt a hybrid of both transactional and transformational leadership based on their peculiar benefits in enhancing project performance is advocated in the literature (Schriesheim et al., 2006). In another context, Grill et al. (2019) associated the intellectual congitive ability of transformational leadership and contingency rewards of transactional leadership with improvement in project safety.

However, transactional leadership may nurture harmful competition within the workforce, with behaviours leading to stress and demotivation, and fear-induced relationship with leaders because of the enforcement of active management by exception approach. Hence,

transactional leadership is not considered as appropriate for the present study, because of the sensitive nature of cross-cultural interactions in project teams.

Once more, research results indicate a positive correlation between authentic leadership and employee motivation (Hidayat, 2016); and create transparent communications, which enhances the organizational adaptiveness of the employee (Men & Stacks, 2014). However, Alvesson and Einola (2019) argues that the dimensions of authentic leadership lack clarity and still evolving in its early stages. The four measured dimensions of authentic leadership in the in the literature (Walumbwa et al., 2008), include internalized moral perspective, self-awareness of the leader, balanced processing, and transparency in relating with followers. These dimensions focus on self-improvement in leadership, particularly enhancing relationships within the team for a more effective and cohesive work environment. However, one can say that there are indications in the theory that this style of leadership might not allow for self-will and self-confidence among team members.

Adaptive leadership has not been studied extensive in project delivery because it is mainly a reactive approach to leadership; to address issues impacting on poor performance (Newton, 2008; Northouse, 2019), and on issues that are external to the organization, such as poor performance in corporate social responsibility (CSR). Hence, adaptive leadership style must be combined with other styles of leadership. However, this leadership approach can reduce delays in project schedules by ensuring issues impacting on project success are resolved appropriately and on time. Again, ethical leadership is embedded in authentic leadership, which is already discussed above. Some characteristics of other leadership styles in the literature (e.g., traits, behavioural and servant leadership theories) can be found in the leadership styles discussed above hence not discussed exclusively.

Effective project leadership depends on the ability of the leader to change his or her leadership behaviour in response to the current project demand (Northouse, 2016). However,

the three main leadership approaches studied in project delivery – transformational, transactional and authentic, are not independently suitable for the current cross-culture and team effectiveness driven construct advocated in this research, because leadership must communicate the vision of the organization, establish the needed goals, monitor work progress, and motivate the workforce (Mumford, Zaccaro, Harding, Jacobs, & Fleishman 2000).

Therefore, a leadership approach solely focused on motivating followers to attain a shared objective, lacking expertise in the key elements of the project quality framework (cost, time, and scope), can cause project delays. This deficiency arises because the project team may not receive the necessary competence and skill, thus hindering effective team productive outcome. So far, no previous study has addressed the interactions among cross-culture, organizational culture, team effectiveness and path-goal leadership in one research construct. Also, the leadership styles discussed above do not individually reflect the styles identified as ideal for exceptional project performance in the literature (Margules, 2011) discussed earlier, except they are combined.

Additionally, in projects necessitating synchronized collaboration and communication (Kuster et al., 2011), variety of leadership styles must be applied concurrently throughout the project's duration. Therefore, this study adopts a path-goal leadership behaviour as most appropriate for investigating how leadership mediation influences the interaction among the other variables of the study SEM construct. The relevant theories adopted in this research are discussed next

Path-Goal Leadership Theory

This theory is defined by the characteristics of the expectancy theory (Spector, 2012); that the adopted style of leadership should encourage subordinates' expectation of instantaneous or imminent satisfaction (Northouse, 2016, 2019). The rationale for adopting a P-G leadership mediation approach is based on the need for a follower-oriented leadership with

focus on removing barriers that negatively affects their performance. This is because it is important to combine and balance the "process" and "influencing" characteristics of leadership in enhancing the performance of the team. Again, current project teams are increasingly being composed of millennials.

Evidence in the literature suggests that the organizational adaptability of millennials is driven mainly by leadership career development, the fulfilment of personal goals, and the preference of coaches and mentors as supervisors who identify with their emotions (Gallup, 2016; Umuteme, 2020). This underscores the importance of investing in leadership structures through training and development for future leaders (Zaccaro & Klimoski, 2001), aligning with path-goal leadership principles.

Also, empirical evidence indicates that subordinates' commitment positively correlates with all four leadership styles in the path-goal leadership theory (Polston-Murdoch, 2013). Another study that compares transformational and path-goal leadership reveals that subordinate's performance was improved at the leadership-individual follower relationship that is advocated in the path-goal theory (Schriesheim et al., 2006). Hence, as a non-prescriptive approach to leadership but dictated by the dynamics in the workplace, the aim is to improve the relationship between the leadership and individual team member (Umuteme & Adegbite, 2022), since leadership is mainly the creation of a leadership-followers connection (Graen & Uhl-Bien, 1995).

The path-goal theory shows that the failure of any organization is dependent on the leadership. Again, the theory encourages leaders to demonstrate technical competence as well as competence in communication and other soft skills. The "participative" behavioural aspect of the theory supports responsive and shared leadership. The concept of shared leadership is important because it improves the effectiveness of organizing and planning in a team (Barnett & Weidenfeller, 2016; Martin et al., 2014).

More importantly, the theory demonstrates that leadership is needed in every section of the organization, including human resources, production, product marketing, and financing. The path-goal leadership theory emphasises that the leadership approach must be adapted to the characteristics of the workers and the task to be achieved. While removing the barriers impacting on the productive outcome, the oath-goal leader is able to motivate the team through the adoption any or a mix of the path-goal leadership behavioural dimensions that were mentioned earlier.

Therefore, the path-goal leader provides clear direction when specifying goals and expectations in directive leaderrship; supportive when responding to issues indicating that the worker lacks self-confidence in performing the job; participative when the workers actively influence leadership decisions, provided it enhances project quality and delivery; and achievement oriented when the goals are challenging and project team members are expected to perform at higher level of expectation (Polston-Murdoch, 2013). Each of the path-goal leadership behaviour can be adopted at different stages of the project. This thesis will also identify which of the measured path-goal leadership behaviours – *directive, supportive, participative, and achievement-oriented,* is predominant throughout the project delivery process.

Cross-Culture Theory

Scholars agree that there is need to understand cross-cultural interrelationships as a significant dimension of workplace diversity (Forsyth, 2010; Fox et al., 2000; Salas et al., 2015; Tuckman, 1965; White & Lippitt, 1968; Wolman, 1956). Due to globalization, organizational effectiveness is driven by cross-cultural harmony in the workplace to attract talents and enhance creativity and overall employee job satisfaction (Miroshnik, 2013; Schein, 2004; Spector, 2012). For this reason, studies in workplace cultural diversity exist in the fields of

sociology, anthropology, and psychology. Yet, the concept of culture is still not wholly understood by neither of these disciplines (Miroshnik, 2013; Schein, 2004).

Generally, cultural diversity studies in the workplace are anchored on both social identity theory and self-categorization theory. These theories explain how employees relate with team members and non-team members in the workplace. Bitsani (2013), Dorfman et al. (2012) and Hofstede (2011), suggests that CCD can impact the PTE. Consequently, the four Hofstede's dimensions of cross-culture associated with this thesis include: power distance, uncertainty avoidance, individualism versus collectivism and long term versus short term orientation. The implication of Hofstede's two other dimensions of cross-culture on project outcome, including masculinity and feminity, and indulgence versus restriants, are inferred from the outcome of the study in chapter 5.

Empirical results suggests that to prevent issues emanating from cross-cultural differences in the workplace, employees prefers a leader who encourages collaboration and team integration, humane-oriented and encourages participative leadership (Dorfman et al., 2012). The association of the above four dimensions of cross-culture with the four leadership behaviours of the path-goal leadership theory in a project setting will be investigated in this research.

Organizational Culture Theory

Studies indicates that an organizational culture that encourages teamwork equally facilitates employees' work commitment (Morrow, 1997). A study of about 230 companies (public, private, and non-profit) and 1300 executives across Africa, Asia, Europe, the Middle East, North America, Oceania, and South America through an online survey (Groysberg et al., 2018), reports that organizational performance was improved adopting the a fit-for-purpose culture. Consequently, a leader can promote a sense of team cohesion within the workforce by comprehending the social and political dynamics at play in the workplace (Zaccaro &

Klimoski, 2001). But, the *initiating structure* approach to leadership, which defines autocratic and transactional leadership behaviour, is strongly dependent on the enforcement of power and is productive for routine tasks were teamwork independence is vital for productivity (House, 1971; Northouse, 2019). This is corroborated by empirical observation in Fleishman (1973), that pressure for output can increase grievance among the work force.

Hence, project team performance can be moderated by the right organizational culture, because it is enforced by the style of leadership (Schein, 2004). Already, there are indications of a significant and positive association between team effectiveness and the organizational culture (Denison & Mishra, 1995; Denison, Nieminen, & Kotrba, 2014; Littrell et al., 2018; Tsai, 2011). Since culture involves shared learned beliefs that can influence the emotions and behaviours of employees (Schein, 2004), there are suggestions from empirical studies that employees derive social identity and belongingness in the workplace, as a way of increasing their motivation and job satisfaction (Tsai, 2011). Based on the organizational culture competing values framework (CVF) model (Cameron & Quinn, 2011; Quinn, 1988), the clan culture is most suited for cross-functional teamwork, participation, empowerment, and innovation. Implying that project team effectiveness is highly internalized and flexible and depends on team cohesiveness, team morale, human resource development and mutual support among team members of the team (Helfrich et al., 2007; Kalliath et al., 1999). Through explicit behaviour, the team member invest whole-self in ensuring that the project succeeds (Cameron & Quinn, 2011).

However, this organizational citizenship behaviour is possible when the right leadership style is adopted by the top and project team management. Consequently, the benefits of having a viable workplace cultural harmony includes enhancing competitiveness, increasing revenues, and driving employees' performance and adaptability. Therefore, it can be inferred from above that culture can impact organizational effectiveness (Dorfman et al., 2012). The

industry of study has witnessed a mix of cultural values owning to the presence of multinational companies that are actively involved in both the upstream and downstream sector of the business.

Again, Nigeria is multicultural nation (Elegbe & Nwachukwu, 2017) and the need to understand the impact of cultural mix in the workplace is evident to resolve workforce tension(s) that have their roots in cultural disharmony, such as employees' preferred values, traditions, beliefs, interactions, behaviours, and attitudes. The dimensions measured in this study based on the characteristics of project activities include *mission*, *adaptability*, *involvement, and consistency*, as discussed exhaustively in the literature (Denison et al., 2014).

Team Effectiveness Theory

Rego et al. (2016) suggest that the style of leadership in an organization can influence the productive effectiveness of the members of the project team, with significant and positive association with organizational culture (Littrell et al., 2018; Tsai, 2011). The need to integrate project and people capability has been emphasised in the literature (Bredin, 2008). This explains the need for a leadership style that enhances team motivation to achieve the project quality (Dinh & Salas, 2017), as emphasized in the path-goal theory of leadership. The bond between a leader and every team member throughout the project duration can be explained by the psychological contract theory; which defines the perceptions and expectations of both the leader and the project team member based on mutual commitments in the employment-exchange-relationship agreement (Raja et al., 2004). This is because, projects do not last for a lifetime, as they have both start and finish dates.

Empirical evidence suggests that a leadership based on *individualized consideration*, *intellectual stimulation, and charisma* contributes more positively towards the attainment of the organizational goal (Howell & Avolio, 1993). Hence, the project leader is engrossed with the psychology of enhancing effective exchange relationship with subordinates. Implying that

workers with a shorter duration of work in the project are expected to be more transactional than being relational with the leadership (Millward & Hopkins, 1998).

Also, varied level of negative organizational citizenship behaviour (OCB) are expected during participation in meetings and the willingness to provide constructive suggestions (Podsakoff et al., 2000), including absence culture (Nicholson & Johns, 1985) when a worker is more transactional than relational with the leadership. Therefore, it is the duty of the leadership to reduce or eliminate employee's turnover throughout the duration of the project by ensuring that the effect of varied personalities in the project team is enhanced for positive outcomes.

Furthermore, another research suggests that the intentions to quit the job is more prevalent in project members with shorter duration of engagement and transactional relationship with the leadership (Raja et al., 2004). To sustain teamwork through employees' socializing and interpersonal communication (Willcoxson & Millett, 2000), team members must be empowered to act as a vital part of the organization (Bennis & Nanus, 1985). Thus, person-oriented leadership approach is advocated in this thesis, so that project leadership is based on the path-goal individual-employee-based leadership behaviour where the characteristic of the job is matched with that of the employee. Also, there is the need for teamwork norms in the organization as construction project activities are interdependent in nature (Hoegl et al., 2004; Newton, 2008; Wakefield et al., 2008).

Consequently, the drive for effectiveness is able to influence the design of teams, competencies within the team and project leadership (Kozlowski & Ilgen, 2006). Again, studies in team effectiveness have led to the development of both theoretical and empirical models that addresses the design of teams, competency development frameworks and team leadership. This investigation adopts the following dimensions of team effectiveness: *socializing process,*

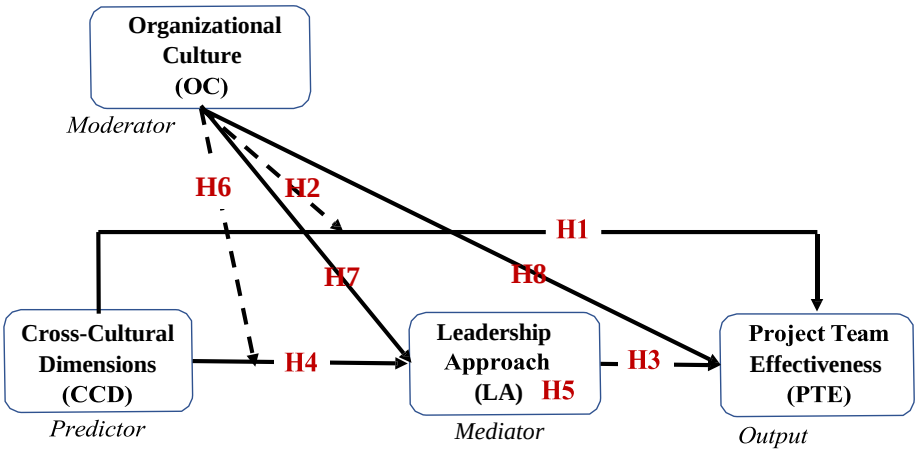
productive output, and group experience, from the literature (Hackman, 2002; Wageman et al., 2005).

Research Hypotheses

Based on the discussions of the four key concepts of this thesis and the relationship established from the literature among them, the hypotheses tested in the investigation are based on the theoretical framework below.

Figure 2.1

Research Hypotheses Theoretical framework



The eight null and alternate hypotheses identified from the framework in Figure 2.1, include:

(H0). There is no significant positive relationship between CCD and PTE.

(H1a). A significant positive relationship exists between CCD and PTE.

(H20). There is no significant moderating effect of OC on the direct positive relationship between CCD and PTE.

(H2a) - There is a significant positive moderating effect of OC on the direct positive relationship between CCD and PTE.

(H0). There is no significant positive relationship between CCD and PTE.

(H1a). A significant positive relationship exists between CCD and PTE.

(H20). There is no significant moderating effect of OC on the direct positive relationship between CCD and PTE.

(H2a) - There is a significant positive moderating effect of OC on the direct positive relationship between CCD and PTE.

(H60) – There is no significant positive moderating effect of OC on the LA mediated significant positive relationship between CCD and PTE.

(H6a) – There is a significant positive moderating effect of OC on the LA mediated significant positive relationship between CCD and PTE

(H70) - There is no significant positive relationship between OC and LA

(H7a) - There is a significant positive relationship between OC and LA.

(H80) - There is a significant positive relationship between OC and PTE.

(H8a) - There is a significant positive relationship between OC and PTE.

(H3c) – There is a significant positive relationship between CCD and LA.

Each of the concepts in the theoretical/conceptual framework are defined below:

Cross-Culture: "Culture is the collective programming of the mind that distinguishes the members of one group or category of people from others" (Hofstede, 2011, p. 3). This concept explains how people from different cultural beliefs and assumptions interact to create a team culture. This team culture is influenced by organizational culture moderation in this study to ensure that the norms that define the expected behaviour in the team is controlled by organizational policies.

Leadership Approach: Leadership "is a major force that influences goals, the amount of involvement with and commitment to productivity, the amount of creativity in solving problems, and the degree of satisfaction from work" (Blake & Mouton 1981, p.440). As a mediating construct, the regressed effect of CCD on PTE is expected to be reduced by the presence of leadership with a possible improvement in the effectiveness of the team.

Project Team Effectiveness: Team effectiveness have been defined from the perspective of socializing process, productive output, and group experience as detailed in the literature (Wageman et al., 2005). Accordingly, the literature explained team effectiveness as the team's output consistently meeting specified quality, quantity and timeliness; socializing among team members enhancing their capability to work together interdependently with minimal supervision; and team meetings and interactions have a positive impact on individual team members' onn-the-job learning and well-being. Team effectiveness is the main independent latent variable in this research.

Organizational Culture: This concept is defined " as the accumulated shared learning of a given group, covering behavioural, emotional, and cognitive elements of the group members' total psychological functioning" (Schein, 2004, p. 17). As a moderator in this construct, it implies that the link between CCD and PTE and between CCD and LA, depends on the measured dimensions of OC.

Industry Description

The leadership model developed in this work is aimed at addressing the need to improve project delivery in the Nigerian petroleum exploration and extractive industry. The operations of the organizations in the petroleum business supply chain framework are dictated by the classifications under upstream, midstream or downstream (Herkenhoff, 2018). The Nigerian oil and gas industry is a vibrant multimillion-dollar industry with huge reserves of oil and gas, and is the main source of the nation'seconomic development. However, the high investment risk associated with the industry is attributed to reservoir and product price uncertainties (Dickson, 2019; Haider, 2020; Jahn et al., 2008). Therefore, it is important to consider the implications of these risks because the financing of projects in the industry is reliant on price stability of oil and gas, discount rates and internal rate of return, payout period, exchange rates and inflation rates, and other prevailing factors in the global market (Jahn et al., 2008).

A major factor influencing the pace of project activities in this industry is the increasing demand for energy globally. With globalization, organizational and project leadership transverses various cultures and professions, and it is imperative on the investors in the industry to curtail the negative impact of the presence of multicultural dimensions in project teams on project delays and cost overrun. Hence, the focus of this thesis is in response to the need for a project leadership mediated model that minimises cross-cultural friction within the team and can improve project team effectiveness for top quartile project delivery and organizational performance.

Organizational Leadership

This PhD investigation is in response to the need in the literature (Haslam et al., 2011) to develop a psychology of leadership that can respond to the context of application and enhance the leadership-followership relationship. Thus, the adopted approach is psychological in nature with focus on understanding the leadership attitude-driven response from followers influencing the leader-followers nexus. Therefore, this section investigates organizational leadership as a complex process that generate both structured and patterned behaviour (Marion, 2012), including the existence of social dynamics from human interactions (Heifetz, 1994), and the systems influencing rapid changes in the organization (Cummings, 2015). Hence, leadership can be viewed from the perspective of systems theory: to understand leadership as a wholistic phenomenon that permeates every aspect of the organization.

So far, there is a general consensus among researchers that leaders influence followers through a change process that is aimed at achieving the common goal (Burns, 1978; Ivancevich et al., 2013; Northouse, 2016, 2019; Stogdill, 1974). The link between the leader and followers is defined by the existence of a relationship (Graen & Uhl-Bien, 1995) that is basically determined by the extent of human wants (Burns, 1978). In a documented understanding of leadership, it was observed that a leader must be sensitive to developing situations that can

hinder performance, knowledgeable enough to provide up-to-date information to followers, and take the right decision to continuously establish purpose and vision (Umuteme, 2012).

Also, it is important to understand how leadership styles affects the behaviour of the workforce, as studies have shown that renumeration and promotion in the workplace is related to the behaviour of workers towards the goals of the organization (Kark et al., 2018). The discussion that follows will critically assess the psychological theories of leadership, and compare the characteristics of each leadership style against project leadership characteristics that were defined earlier in the literature (Margules, 2011).

Psychological Theories of Leadership

The study of leadership has a rich history that dates to the days of Plato in 380BC. In his *Republic*, Plato argued that those fit to lead are those with knowledge, leading to the early contextual definition of the *great man* leadership theory (Haslam et al., 2011; Pendleton & Furnham, 2019; Plato, 2000). Some early leadership studies were based on the responses of animals to situations that were related to survival and male dominance (Burns, 1978). Later, the idea of *great leaders* or *great man* theory dominated the study of leadership. However, the characteristics that makes *great men* leaders could not be easily ascertained, even when the formative years of these leaders were studied (Burns, 1978).

Still, some scholars argue that *great man* theory holds the mystery behind leadership (Cawthon, 1996). As the study of leadership develops, traits, behavioural, situational, and contingency theories evolved, and later led to the newer forms of leadership theories, such as charismatic, transformational, and transactional leadership. Hence, it remains difficult to have a universally accepted definition for leadership. Today, the leadership-followership relationship is still seen as an interactive process where the leader influences the followers to accomplish the agreed goal.

The position of psychology in the study of leadership involves understanding the mental states and the process that influences followers to listen to their leaders (Haslam et al., 2011). Hence, over 2000 years after Plato, psychologists are still addressing the subject of leadership through a systematic approach that investigates both social and other contextual factors that determine and strengthens the leader-followers complementarity. Some of these factors include cross-culture and organizational culture (Haslam et al., 2011), because leadership arouses passion and influences our value system (Heifetz, 1994).

Accordingly, the contextualization of leadership is comprised of both cross-cultural dimensions existing in the workforce, as well as the organizational culture. The theories discussed after now are selected based on the need to improve leadership commitment in enhancing the performance of the members of a project team. They include personality traits, behavioural, contingency, situation, path-goal, transformational, transactional, authentic, servant and ethical leadership theories, and the implication of electronic technology in emerging e-leadership theory.

Adaptive and discursive leadership theories were not specifically discussed separately because their characteristics suggests that they have similar characteristics with the leadership theories mentioned above. More emphasis has been given to transactional, transformational, and authentic leadership theories because they have been adopted in the study of project team performance in the literature. Also, the emphasis and detailed discussion on the path-goal theory is based on the need of this study, as the adopted multi-style leadership approach for project leadership.

Personality Traits Leadership

Emerging in the early 20th century, traits-based perspectives of studying leadership was the beginning of scientific enquiry into leadership theory development (Zaccaro, 2007), and it developed out of the weakness of the “great men” theory because of the necessity to outline

observable personality traits that differentiate leaders from their followers (Northouse, 2016, 2019). This way of assessing leadership defines the leadership qualities and characteristics that can be learned and nurtured and are helpful when leading a team. For example, resilience, integrity, trustworthiness, assertiveness, ambition, achievement, and others, have been identified as leadership personality traits in the literature (Northouse, 2019).

Generally, it is believed that these qualities are innate and that one is either born with them or not. Kirkpatrick and Locke (1991) argues that while traits do matter in leadership, they cannot guarantee effective leadership except the leader take some actions, such as formulating a vision, role modelling and setting goals, to become successful. Implying that the individual can take steps to become more assertive or resilient, or to develop any other type of characteristics that are useful in a specific leadership setting. Thus, the idea of *traits alone* is no longer accepted as mainstream leadership concept and theory. It should be expected that leaders can pass on the traits of leadership to their successors (Heifetz, 1994).

However, this is not the reality as the current dynamics in global competitiveness in 21st century business landscape has shown that leadership is also dynamic. For instance, the adopted leadership approach by organizational leaders since the Covid-19 lockdown and restricted work culture is obviously not expected to be the same leadership behaviour that existed before the pandemic. Also, the multiplicity of traits in a leader can make it difficult to identify which of the traits actually influence the leader-followers link (Hu & Judge, 2017). Hence, it is difficult to assess leaders based on a fit-for-all list of traits.

Consequently, one can say that the problem with this position is the need to include situational variables in determining which traits are distal or proximal in nature, and without bias or subjective assertion. This position is corroborated in a study where the personality traits of the leader was assessed by both leaders and followers, and the outcome shows a wide variance in identified traits (Colbert et al., 2012). As explained in Northouse (2019), the

concern on the subjective determination of dominant traits influencing the action of the leaders was the main criticism of the traits leadership theories. The leadership traits questionnaire (LTQ) in Northouse (2019) implies that not all the traits made the list. Hence, it is still open to criticism on the exclusion rationale.

The empirical outcome in the literature (Derue et al., 2011) suggests that the association between leadership effectiveness and the measured personality traits were poor, accounting for less than 2% of the variance. Consequently, the authors recommended a mediating role of other leadership styles to enhance leadership effectiveness. Equally, Zaccaro (2007) suggests that some leadership personality traits are distal while others are proximal in nature, and that to predict leadership behaviour, the traits can be combined to solve the present leadership need.

Another empirical evidence on leadership emergence, indicates that traits can be observed through genetic factors, which can account for up to 30% of the factors that determine leadership (social potency, achievement, and social closeness), while the remaining 70% determining factors of leadership are environmental in nature (Arvey et al., 2006). Implying that *traits-alone* leadership approach is not fully associated with group and team performance (Northouse, 2019)**,** which are important concepts in this doctoral research. With the above analysis, even when observable traits are inherent in the leadership of an organization (Northouse, 2016, 2019), it is important to discuss other theories of leadership beyond personality traits, that can provide further insights into the factors determining leadership mediating role in project team effectiveness.

Behavioural Leadership

Behavioural leadership approach focuses on the conduct of the leader under various work-related environmental factors. Hence, the study of leadership is "exclusively on what leaders do and how they act" (Northouse 2019, p. 73), such as task (*initiating structure*) behaviours and relationship (*consideration*) behaviours. The *initiating structure* behaviour

defines the leader's role in providing direction, while the *consideration* behaviour is the ability to develop humane-oriented behaviours that can improve the trust and commitment of the workforce. A leader who scores high on both continua in the Leader Behaviour Description Questionnaire (LBDQ) is considered effective. However, studies suggests that this is a very rare case. Instead, leaders were highly oriented towards either of the two leadership behaviours. Other studies across cross-cultures on both dimensions follows the work of Misumi (1985), where *initiating structure* (task) is considered as planning (P) and *consideration* (relationship) as Maintenance (M), and often described as distinctive P-M behaviours of a leader (Berry et al., 2002; Peterson & Smith, 1990).

The P-M leadership theory corroborates the position that a leader cannot be highly effective in both domains in every given situation. Again, both leadership behaviours (task and relationship) were paralleled in the leadership grid in the literature (Blake & Mouton, 1981), with emphasis on maximizing production and concern for the people to enhance commitment, interdependence, and leader-follower relationship based on mutual trust and respect. Some leaders have been described as autocratic – that is, making decisions without encouraging input from their followers, while the opposite is democratic leadership approach. The characteristics of the behavioural approach to leadership can be seen in the LBDQ adopted in Northouse (2019).

Contingency Leadership

In the contingency leadership approach, the emphasis is the leader's motivational role in supporting the performance of the group. Fiedler developed the Least Preferred Co-worker (LPC) scale to assess the motivational approach of the leader (task or relationship), in response to the work situation (Fiedler, 1972). The LPC scale measures the leader-member interactions, task structure, and the leader's power of influence. Thus, it is possible to assess the reason for a poor working connection between the leader and some work-group members. However, the

motivational structure emanates from the leader and defines his or her leadership effectiveness (Fiedler, 1981).

Implying that different situations requires different leaders, hence the LPC theory is more of traits than behavioural (Vroom & Jaago, 2007). Again, the LPC does not explain the how and why of the leadership behaviour. The path-goal leadership approach that will be discussed extensively later, is a modification of the LPC contingency theory, with the central idea that leader-subordinate interaction is based on the characteristics of the follower and that of the task to be achieved (Northouse, 2019; Vroom & Jaago, 2007).

Situational Leadership

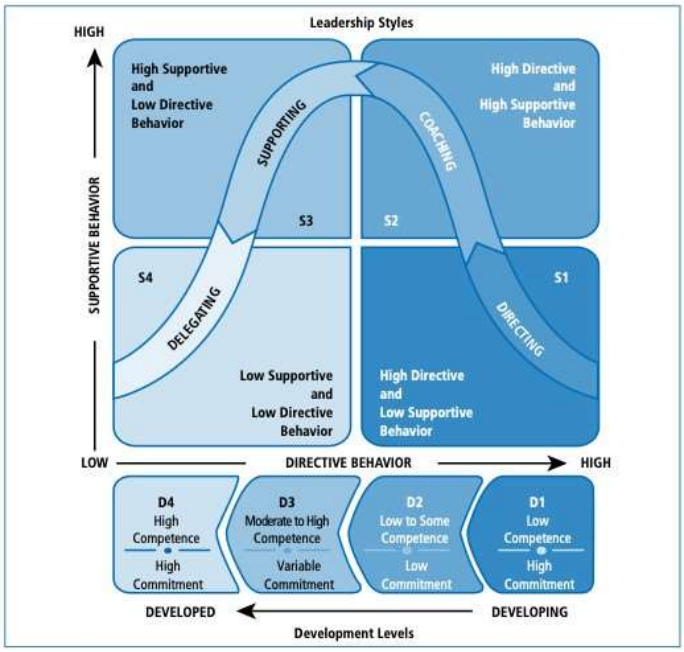
Situational leadership is a way of determining what combination of leadership styles is most appropriate in any given situation. A leader who adopts situation leadership is expected to combine both directive and supportive leadership behaviour to assist subordinates in completing their tasks (Blanchard et al., 1993). As seen from the above figure, the behaviour adopted by the leader is related to the competence level of the subordinate. When the subordinate is developed, it implies he or she has mastered the skills appropriate for completing the task (Blanchard et al., 1993). When the subordinate is experienced, the leader minimises *supporting* and *directing*, but increases *delegation*.

Similarly, the opposite involves *direct coaching* by the leader. Vroom and Jaago (2007) suggests that there are situational factors that influences organizational effectiveness which are outside the control of the leader, and that situations dictate the behaviour of the leader, and the consequence of the adopted leadership behaviour is also an outcome of the situation. Hence, the situational theory can be employed in developing subordinates to take greater responsibilities as they grow along the leadership hierarchy. The path-goal theory, discussed next, increased the leadership behaviour by adding participative and achievement-oriented approach, and emphasises that each approach is unique under a unique work context.

The understanding posited in the literature (Northouse, 2019) on how both directive and supportive leadership styles can be combined is presented in Figure 2.2.

Figure 2.2

A model of situational leadership (Northouse, 2016, p. 95)

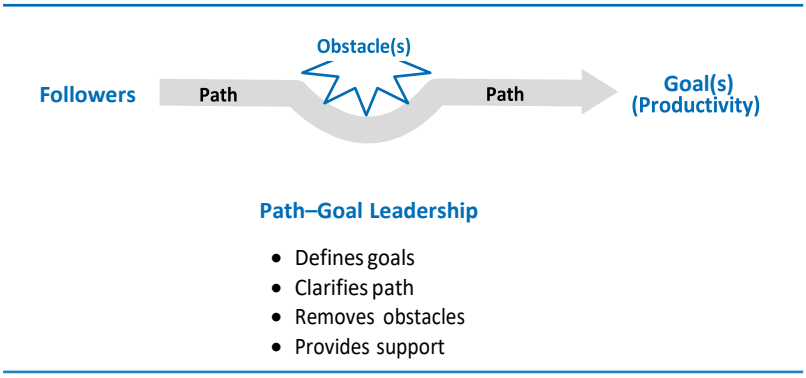


Path-Goal Leadership

The purpose of this theory according to Northouse (2019, p. 117), "… is to enhance follower performance and follower satisfaction by focusing on follower motivation." Evidence in the literature indicates that this theory was first developed in Evans (1970) and later modified in House (1971). Further modifications to the theory featured in the literature (Evans, 1996; House & Mitchell, 1974). From this figure, the theory proposes that followers achieve the needed productivity when the leadership defines clear goals, clarifies the path to achieving the goals, removes obstacles that hinder productivity and employee job satisfaction, and provides the needed support to employees. From Maslow's hierarchy of needs (Maslow, 1943), it is emphasised that employees can be motivated to improve productivity provided their needs are met. In nutshell, this theory suggests that leadership is aimed at removing barriers that hinders productivity as indicated in Figure 2.3 below.

Figure 2.3

A model of path-goal leadership (Northouse, 2016, p. 118)



Therefore, one can argue that Path-Goal leadership encourages a win-win approach to leadership. Whereas the theory has several strengths based on its application, especially for developing a framework for comparing a leader's performance under different task and follower's characteristics, critics of the theory have also argued that the theory has some shortcomings based on its effectiveness, especially due to the combination of multiple leadership styles and sets of assumptions (Northouse, 2019). However, the multiple style of leadership advocated in the theory is shown in this research to be appropriate for project team leadership. The next section discusses major components of the theory.

Components of the Path-Goal Leadership Theory

The basic conceptualization of the Path-Goal theory is presented in The criteria for adopting any or a combination of these four leadership behaviours compared with both followers' and task characteristics are presented in Table 2.1and discussed further.

Figure 2.4, below. As stated earlier, the focus of this theory is to remove barriers that hinders workers from achieving the common goal. Accordingly, as originally espoused by Evans (1970), the Path-Goal theory is a process that advocates that the leader must adopt a specific behaviour that is best suited to the needs of the employees and the workplace. In order words, leadership in this context can be seen as a behaviour determined by the goals to be

achieved. The criteria for adopting any or a combination of these four leadership behaviours compared with both followers' and task characteristics are presented in Table 2.1and discussed further.

Figure 2.4

Components of the path-goal leadership (Northouse 2016, p. 117)

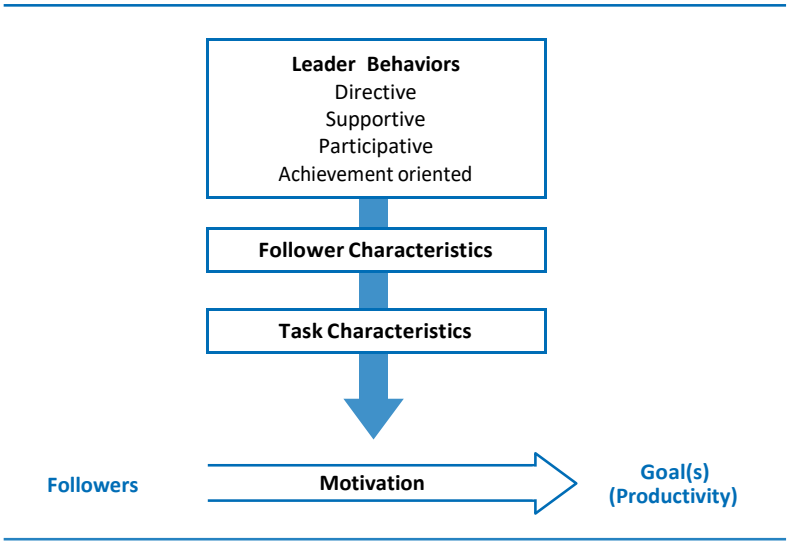


Table 2.1

Application of the four leadership behaviours (Northouse 2019, p. 121)

Leadership Behavior	Follower Characteristics	Task Characteristics
Directive Provides guidance and psychological structure	Dogmatic Authoritarian	Ambiguous Unclear rules Complex
Supportive Provides nurturance	Unsatisfied Need affiliation Need human touch	Repetitive Unchallenging Mundane
Participative Provides involvement	Autonomous Need for control Need for clarity	Ambiguous Unclear Unstructured
Achievement Oriented Provides challenges	High expectations Need to excel	Ambiguous Challenging

Application of the Path-Goal Leadership Theory

The theory is applied with respect to the expected leadership behaviour based on the followers and tasks characteristics.

Directive leadership behaviour: According to the theory, a leader assumes a directing role when improving collaboration with followers for tasks that are ambiguous, unstructured, and complex (Vroom & Jaago, 2007). However, the followers need to obey rules (dogmatic) and have regard for authorities and orders (authoritarian). The question is: how much of directive leadership is productive and where can the leader draw the line between directing and not directing? Again, since this approach will lead to full control and monitoring of both task and workforce, it is likely that the leader-follower relationship can go sour when the follower assumes self-sufficiency and need lesser directing from the leader. Hence, it is my opinion that the extent and timing of *directing* be agreed *ab initio* with employees. For engineering projects, *directing* behaviour is visible when the leadership define the scope, budget, and timing of the project, and provides standards and specifications that governs the project's framework.

Supportive leadership behaviour: Here, the leader assumes a supporting role for the followers to achieve more, since they already have the competence to achieve their tasks, provided the task is non-complex, structured and routine in nature. This support can be in the form of salary advance to allow the employee to settle some physiological needs or on-the-job training to improve self-efficacy and productivity. However, since employees' needs are dynamic in nature, one can argue that a one-off supportive approach might not yield the expected outcome overtime, hence the need for interdependence support within the team. Therefore, the leader must continuously assess the current situation and the extent of the support that is appropriate.

Participative leadership behaviour: As the name implies, here the leader continuously consults with followers to arrive at an all-inclusive decision. This approach is needed when

followers are experts in their field but need clarification on the expected goals from the leadership. Here, the tasks are ambiguous, unstructured and with unclear scope, such as investments in new frontiers and the implementation of new technology. In project teams where this approach is implemented, the project owner can clarify the scope, while the workers produce the design, cost, and schedule.

Achievement-oriented leadership behaviour: In this approach, the leader expects followers to achieve higher performance by "executing ambiguous, unclear, and unstructured tasks" (Umuteme & Adegbite, 2022, p. 187). This kind of approach is expected in engineering projects at the formative stage and when there is schedule creep. In this scenario, workers are given stretching targets with defined indicators for measuring success, and incentives can be provided to motivate employees to achieve the high standard set by the leader.

Effectiveness of the Path-Goal Leadership Theory

In Northouse (2019), the effectiveness of path-goal leadership theory was based on the conceptualization, that: (a) leadership is not rigid but a situation-dependent approach aimed at assisting employees to succeed in their tasks through a framework that assesses the strengths and weaknesses of followers and the goal(s) to be achieved; (b) employees' motivation is interwoven into the expected reward, hence the path-goal theory is integrated into the expectancy theory: that the required behaviour to drive performance can be achieved through motivation by using rewards or punishments (Vroom, 1964); and (c) leadership effectiveness is a function of how leaders guide and coach followers to accomplish the agreed task and goal, rather than leaders taking a dictatorial and domineering approach to leadership; implying that leadership is a practical responsibility on the leader to guarantee the productive growth of the organization through the workforce.

From these strengths, one can say that the path-goal theory brings a humane-oriented approach to leadership. It equally follows that humans responds to the psychological

environments surrounding them (Spector, 2012) such that, the leader's emotional intelligence is put to test by how he or she interfaces with the emotions of followers. Accordingly, the path-goal leadership measurement tool (Northouse, 2019) estimates a leader's scores across the four domains of - directive, supportive, participative and achievement-oriented styles, and a leader can have very high scores in one of the domains under certain task orientations.

Criticism of Path-Goal Leadership Theory

The main criticisms of path-goal leadership theory in the literature (Northouse, 2019), are discussed in this section. The first is related to the multiple leadership styles proposed and the complexity involved in truly mapping a leadership style to a workplace situation, as discussed earlier. Second, is the fact that there are few empirical results that supports this theory. Yet, on a personal note this calls for more studies as the original intention was to lead to the development of further contingency leadership constructs.

Third, is that the theory did not clearly explain the relationship between each leadership approach and employees' motivation. On this third criticism, one can argue that this should not be a limitation since the theory can be used as a mediator in structural equation modelling to discover various underlying structures in comparison with motivational theories. Thus, what is needed is more scholastic effort in this regard. Fourth and finally, critics believe that this theory places so much control on the leader, such that leadership is treated as a unidirectional supportive *helping-hand* approach from the leader to the followers.

The path-goal theory positions the leader in an authority of full ownership and shows that performance of any organization is dependent on the adopted leadership style. The P-G theory equally encourages leaders to showcase technical proficiency as well as competence in communication and other soft skills (Umuteme & Adegbite, 2022) . More importantly, the theory demonstrates that leadership circumscribes all aspects of the organization, including human resource, production, product marketing, and financing. Though the theory has its

weaknesses, these weaknesses can be strengthened if further research are undertaken where the path-goal leadership approach is treated as a mediating latent variable with the purpose of identifying high factor loading leadership behaviour under certain workplace environmental variables, as implemented in this thesis.

Transformational Leadership

Transformational leadership was first conceptualized for reformation and revolutionary social-cultural change Burns (1978). Burns' ideological concept of transformational leadership was mostly political, with a focus on meeting the needs of the followers. Later, it was extended to organizational leadership by explaining the psychological aspect of transformational leadership in relation to the behaviour of the workforce (Avolio & Bass, 2002). As detailed in Avolio and Bass (2002), the main concepts of transformational leadership are defined by the following characteristics, including: (1) *idealized influence* – when a leader act as a role model to subordinates, executes his/her duties with calculated risks, demonstrates high ethical standards, and receives high level of admiration, respect and trust from followers; (2) *inspiring* – when the leader creates a challenging and meaningful vision, that can engender team spirit and teamwork by demonstrating ownership and commitment to purpose and the organizational mission statement; (3) *intellectually stimulating* – when a leader encourages the framing and reframing of problems through the generation of ideas, critique every assumption, and stimulates innovation and critical thinking among peers and followers; and (4) *individually considerate* – when the leader encourages inter-personal interactive leadership while focusing on the well-being of individuals, enhancing self-efficacy through competency development and enabling a healthy work-life balance in the workplace (Avolio & Bass, 2002; Northouse, 2019).

The findings from past empirical studies suggests that transformational leadership: (a) enhanced the morality, empowerment and motivation of direct followers by averting self-demoralization among followers (Dvir et al., 2002); (b) improved employees' job satisfaction

through the *individualised consideration* characteristics of the transformational leader (Long et al., 2014); (c) stimulates organizational citizenship behaviour in employees (Boerner et al., 2007); (d) is positively correlated with employees' creativity in the workplace (Jyoti & Dev, 2015); (e) positively associated with the performance of subordinate, job satisfaction, and the acceptance of acquisitions especially during the integration of workers in mergers or the acquisition of new corporations (Nemanich & Keller 2007); and (6) stimulates work engagement among the workforce (Tims et al., 2011). The above indications highlight the vital role played by the leaders' personal characteristics as observed in transformational leadership, such as demonstrating optimism, competence, and the articulation of goals. Transformational leaders also set high standards and communicate this clearly to all employees and encourages innovation and creativity towards organizational performance. Table 2.2 pairs each of the characteristics of transformational leadership abd related workforce behaviour.

Table 2.2

Influence of transformational leadership on workforce behaviour

Main Characteristics	Effect on Workforce Behaviour
Idealized influence	Followers can trust and respect the leader and his or her ideology. Research findings indicates that transformational leaders are rated higher than transactional leaders, as being effective in achieving better and improved productivity (Lowe et al., 1996a).
Inspiring	The workers conduct their activities in the workplace with high team spirit. Workers believe that they are part of a shared leadership vision as the transformational leader clearly communicates how their individual roles will lead to the growth and sustainability of the organization (Northouse, 2019).
Intellectually stimulating	The workforce is made up of individuals who are highly creative and innovative, as the leader stimulates a knowledge-creation work environment. Followers continue to think on alternative approaches to improve productivity. For instance, workers in the marketing outfit win

	customers' trust by being responsive to their concerns through improved products offering. This is because, the workforce accomplish more than what is expected of them as they are continually motivated and inspired by the transformational leader to focus on the organizational goal over self-interest (Northouse, 2019).
Individually considerate	Each worker feels important with high self-esteem and self-efficacy, as the transformational leader continue to have interpersonal-development-oriented discussions with them.

In effect, transformational leaders encourage improved creativity, knowledge sharing, innovation, self-motivation, improved self-efficacy, and self-esteem. Despite these positive remarks, one of the major criticisms of this leadership style is on conceptual clarity; since this leadership style overlaps with other styles of leadership, such as charismatic leadership (Northouse, 2019). Equally, some researchers have challenged the multifactor leadership questionnaire (MLQ) validity for measuring transformational leadership.

Another criticism is by researchers who argue that transformational leaders are visionaries with lesser input from their followers, hence not too different from traits leadership (Northouse, 2019). Again, some critics believe transformational leaders see themselves as heroes who decide what their followers do rather than encouraging shared leadership vision between leaders and followers that is often seen in organizations, hence not a realistic leadership theory (Yukl, 2008).

The concept of shared leadership is important because it improves organizing and planning effectiveness in a team (Barnett & Weidenfeller, 2016; Martin et al., 2014). In response to the above criticisms, one can say that since leadership is about how followers are influenced to achieve organizational goals, there is the tendency of different leadership styles overlapping, such that other leadership styles can make up for the deficiencies in

transformational leadership theory. As a result, there is need for the adoption of multiple leadership styles as the situation demands (Behrendt et al., 2017).

Transactional Leadership

This leadership approach was originally espoused by Burns (1978), where leaders link the reward of followers to their effort. Thus, transactional leaders exerts both coercive and position power in evaluating, correcting, and training the workforce towards enhancing productivity with a seemingly proportionate reward. The above characteristics are explained further in the literature (Bass, 1990; Northouse, 2019) in describing leaders who exert leadership authority mainly through: (i) *contingent rewards* – when leaders are more interested in rewarding followers in exchange for the work achieved; and (ii) *management by exception (MBE)* – when the leadership adopts corrective criticism, unconstructive feedback, and hurtful reinforcement in the leader-followers relationship.

In consequence, transnational leaders set expectations and standards for exploiting the efficiency, effectiveness, and productivity of the workforce. Research findings indicate that transactional leadership is more effective in workplace situations with simple routine and clearly defined operational problems (Avolio & Bass, 2002; Bass, 1990; Northouse, 2019). Implying that transaction leadership style reduces organizational cost as there is reduced focus on employee competency development. Consequently, employees might not see the aspiration for upward growth and promotion into leadership roles as priority. .

Table 2.3, characteristics of transactional leadership has been mapped to the associated behaviour of the workforce.

Table 2.3

Effect of transactional leadership style on workforce behaviour

Main Characteristics	Effect on Workforce Behaviour

Contingent rewards	Workers matches their reward with their performance. Hence, the advantage of a highly innovative workforce as seen in transformational leadership is relatively absent (Kark et al., 2018). Studies indicates that employee's job satisfaction is low due to contingent rewards (Folakemi et al., 2016). Since job satisfaction improves employees' job retention level, there is tendency of increased resignation of employees with transactional leadership. Thus, the workforce approaches the transactional leader with a negotiating-purpose attitude (Deluga, 1990).
Management by exception (MBE)	Workers do not feel the sense of belonging, as they always relate their actions to the pay they will get. This also affects the team spirit as reward or punishment is always individualised. Thus, the workforce approach the transactional leader with fear-filled friendliness (Deluga, 1990). This fear-filled relationship can lead to chronic stress (Rowold & Schlotz, 2009), demotivation and encourage destructive competition among the workers which can retard the growth of the organization in the long-run.

Hence, transactional leadership might not be ideal for millennials who prefer fast upward job progression and promotion into leadership roles as motivation for organizational adaptiveness (Umuteme, 2020). Again, transactional leadership model requires a simpler leadership structure with focus on more supervisory roles. Findings from empirical studies suggests that transactional leadership is: (a) positively correlated to high employees motivation for routine and monotonous tasks (Chaudhry & Javed, 2012); (b) negatively correlated to employees' job satisfaction as a result of contingent rewards (Folakemi et al., 2016); and (3) positively correlated to the indicators of chronic stress (e.g., excessive work, dissatisfaction with task, and performance pressure) in employees (Rowold & Schlotz, 2009).

In effect, transactional leadership leads to workforce behaviours that indicates disinterest in creativity in the workplace, resenting attitude to work, tiredness from chronic stress, demotivation, working in fear, and readiness to resign from their job when they get a better paying job. However, based on the above weaknesses it has been suggested that

transformational leadership can augment the negative impact of transactional leadership on the performance of workers and organizational profitability (Rowold & Heinitz, 2007).

Ethical Leadership

This leadership style is "driven by a system of accepted beliefs and appropriate judgments rather than self-interest, which is beneficial for followers, organizations and society" (Kalshoven, Den Hartog, & De Hoogh, 2011, p. 52). From this explanation, the authors developed a multidimensional questionnaire to measure ethical leadership based on seven ethical behaviours: fairness, integrity, ethical guidance, people orientation, power sharing, role clarification, and concern for sustainability. Their findings indicate that ethical leadership was positively correlated with employee satisfaction and work commitment.

Other studies have equally attributed the morality and integrity of a leader to ethical leadership (e.g., Craig & Gustafson, 1998) and that ethical leadership is positively related to employees' motivation (Ouakouak et al., 2020). Also, ethical leadership enhances the organizational citizenship behaviour (OCB) in the workforce (Kalshoven et al., 2011) and facilitates employees' readiness to accept change (Metwally et al., 2019). Generally, ethics is an aspect of organizational leadership, and it is expected that leaders adopting other styles of leadership should display ethical standards in their engagements with followers.

Authentic Leadership

Though this leadership approach is not clearly defined in the literature as it is still in its formative stage, the general understanding of this leadership approach is from three perspective: intrapersonal, interpersonal and developmental leadership (Northouse, 2019). It is intrapersonal, because authentic leaders are concerned about enhancing *self-knowledge, self-regulation,* and *self-concept* (Northouse 2016). From an interpersonal perspective, authentic leaders are interested in the positive outcomes that resulted from the relationship that was created from their interactions with followers.

Finally, it is developmental because authentic leaders take interest in personal development to enhance interactive positive psychological and robust ethics (Northouse 2016; Walumbwa, Avolio, Gardner, Wernsing, & Peterson, 2008). Studies suggest that the impact of authentic leadership on employee motivation is positive (Hidayat, 2016); creates flawless communications, which enhances the organizational adaptiveness of the employee (Men & Stacks, 2014); and enhances team cohesion through the leader's self-regulating behaviour (Lyubovnikova et al., 2017).

Additionally, it encourages specific employee behaviour directed towards change through a communication process that is transparent (Alavi & Gill, 2017). Consequently, a leadership behaviour is authentic when seen as a catalyst for enhancing employee motivation, team unity, and facilitating the change process, all achieved through effective interpersonal communication within the organization.

Servant Leadership

According to Northouse (2016), servant leadership underscores the need for leaders to be attentive to the concerns of their followers, empathise with them, and nurture them to grow. Thus, servant leaders encourage positive behaviours from followers by helping them achieve their full potential (Northouse, 2019). The main characteristics of servant leadership from the literature is an emphasis on the competence and development of employees. Therefore, it is expected that employees who are willing to ascend the hierarchy of leadership in an organization will relate positively with a leader with a servant leadership behaviour. Studies reveal that servant leadership behaviour positively enhances employees' intrinsic motivation (Su et al., 2020); and improves team building through the professional development of team members to enhance team delivery and effectiveness (Bilal et al., 2020; Lemoine et al., 2019), across the mechanisms of team goal and the clarity of team process (Bilal et al., 2020). From the above research position, servant leadership can be said to enhance the organizational

change process, that is part of project management through clearly stated goals and team process.

E-Leadership

The amount of data flowing to all strata of leadership in the 21st century has increased with the use of information systems and technology (Karahanna & Watson, 2006; Zaccaro & Klimoski, 2001). The amount of electronic data in the studied industry is enormous. This needs a proactive leader who attends to performance-related issues as they happen by continuously processing and reviewing the logs of information (Zaccaro & Klimoski, 2001). There is also the need for every project team member to be linked to a common communication platform owned by the company to provide seamless communication and to provide e-security for internal documents, instead of using public email accounts for business communication. A leadership that focuses on enhancing e-communication will develop its own intranet system to control confidential information.

Project Leadership

Large-scale projects in the oil and gas sector demand robust leadership abilities for successful execution (Krahn & Hartment, 2006). In line with the definition posited by the Project Management Institute (PMI), “a project is a temporary endeavour undertaken to create a unique product, service, or result” (PMI 2017, p. 4). Given their distinctive and time-bound nature, projects necessitate proficient leadership equipped with appropriate skills and expertise to ensure timely and budgeted completion. Additionally, projects instigate organizational change, demanding a leadership strategy capable of managing dynamic and stable uncertainties arising from scope definition, goals, and objectives.

These factors influence team size and composition throughout the project duration. Effective leadership must adapt to these challenges, ensuring the optimal utilization of resources to navigate both evolving and constant uncertainties inherent in project management.

The enterprise environmental factors (EEFs) influencing project success are both internal and external (PMI, 2017). The EEFs related to the purpose of this study are internal and includes organizational culture, structure and governance, and employee capability (

Table 2.4).

Table 2.4

EEFs related to this research - adapted from PMI (2017)

Enterprise Environmental Factors	**Domain of Influence**
Organizational culture, structure, and governance	Vision, mission, values, beliefs, cultural norms, leadership style, hierarchy and authority relationships, organizational style, ethics, and code of conduct.
Employee capability	Existing human resources expertise, skills, competencies, and specialized knowledge.

Thus, the challenges of project leadership comprises of the simultaneous development of the technical and behavioural competencies of team members, as the project life-cycle is modified during the project duration (Kloppenborg & Petrick, 1999). Again, the PMI definition of project leadership is as follows: “the knowledge, skills, and behaviours needed to guide, motivate, and direct a team, to help an organization achieve its business goals” (PMI 2017, p.

56). This definition outlines project leadership's influence on the team to guide, motivate, and direct when the need arises.

Project leaders' roles encompass various tasks such as team meetings, undertaking travels (scheduled and unscheduled), problem-solving sessions, managing communications (internal and external), and attending board meetings (Atesmen, 2015; Kaulio, 2008; Kloppenborg, 2015). Leadership skills in projects encompass, interpersonal skills communication, negotiation, critical thinking, problem-solving, and resilience (PMI 2017). Therefore, identifying the appropriate leadership behaviour is crucial for project completion. The current study emphasizes a distinct project leadership position, that is specifically dedicated to enhancing team effectiveness. While project managers handle budgetary matters, project leaders concentrate on enhancing team efficiency, ensuring a focused and coordinated approach toward achieving project goals.

Effective project leadership is crucial to address challenges that harm project performance. Project delays lead to increased organizational costs, diminished project value, ongoing environmental damage, and negative consequences for the organization's reputation. These delays can also hinder funding inflow for milestone delivery based on the pre-determined key performance indicator (KPI).

A research report in Oman's oil and gas processing facilities by Ruqaishi and Bashir identifies causes of project delays, underscoring the importance of adept project leadership in mitigating these issues and ensuring successful project outcomes (Ruqaishi & Bashir (2015)). Thus, encompassing poor scope definition leading to creep in schedule, incompetence leading to rework, non-payment for completed work leading to demotivation, lack of ownership as a result of poor leadership, poor labour productivity, poor incentives, inadequate organizational structure leading to poor leadership, and effect of social cultural factors.

These problems can be resolved if the right project leadership behaviour is adopted throughout the five phases of the project life cycles as described in Cobb (2012): initiation, planning, launch, execution, and closing. The detail activities in each phase are presented in Table 2.5 below.

Table 2.5

Project life-cycle definition - Adapted from Cobb (2012)

Project Phase	**Objectives**
Initiation	• Define project value and overview of cost implication. Decide whether to proceed with the project.
Planning	• Define precise tasks, resource needs and costs, and the expected completion time.
Launch	• Recruiting the right project team, structuring the team to enhance effectiveness and correct initiation of the actual project work • Working with the project team.
Execution	• Leaders monitor and control the pace of project work, its costs, and performance quality. • Working with external stakeholders, leaders need to maintain project support; ensure flow of project resources; and minimize but adapt to project pressures, disruptions, and changes.
Closing	• Deliver final products, services, and other project outcomes as specified by the client.

Project leadership requirements evolve as the project progresses through its lifecycle (Kloppenborg & Petrick, 1999). However, more attention is given to project leadership in the execution phase in this thesis, and the survey instrument have been structured accordingly to reflect team dynamics during this phase. Although project leadership is relatively new, it has become an active field of study for more than a decade, and still under-investigated as literature search has indicated. In contrast, the study of general leadership has spanned over a century. In the industry, a project team comprises versatile and interdisciplinary professionals (Kerzner,

2017). Thie team stands as the pivotal element in project management, demanding effective leadership for control and provision of essential resources to ensure optimal performance (Atesmen, 2015).

Project leadership in the 21st century need to match the contemporary workplace culture (Lloyd-Walker & Walker, 2011). Examining the literature, the reasons for project delays, previously pinpointed, are correlated with their impact on project performance, as highlighted in the work by Ruqaishi and Bashir (2015) in Table 2.6, below.

Table 2.6

Impact of project delay on the project quality (Adapted from Umuteme & Adegbite, 2022)

Causes of Project Delay (Ruqaishi & Bashir, 2015)	**Effect on Project Performance**
Poor scope definition	Schedule creep and cost escalation
Incompetence	Rework
Delayed payment to contractors	Demotivation, schedule creep and cost escalation
Lack of ownership	Poor leadership
Poor labour productivity	Schedule creep and cost escalation
Poor incentives	Demotivation and employee turnover
Inadequate organizational structure	Ineffective leadership; poor administration of roles
Effect of social cultural factors	Poor interpersonal relationship and increased friction among the members

Demands of Project Leadership

An analysis of project management through 82 case studies and lessons learned documented in the literature (Atesmen, 2015), reveals that project failure can results from poor project leadership. Understanding the demands of project leadership, it is essential to comprehending the difficulties of leading a project team by understanding project tasks characteristics. Examining the previously discussed reasons for project delays, project

leadership's attributes concerning team effectiveness include: (i) defining project scope, objectives and goals, (ii) displaying work ownership, (iii) advancing team competencies, (iv) clarifying the structure of the organization, (v) boosting the productivity of the team, (vi) enhancing incentives, and (vii) mitigating the adverse impact of sociocultural factors.

Clarifying Project Scope, Objectives and Goals

The project scope should encompass the entire project life cycle, serving as a key component within the project's quality measurement framework. A clear scope provides the project team with a comprehensive understanding of the resources necessary for optimal performance. It is the responsibility of the project leadership to articulate the scope, goals, and objectives to both sponsors and the project team (Pyzdek & Keller, 2013). Conducting workshops/meetings where questions that are open-ended are welcomed can further refine the project scope. Notably, the entire team might not be available in the project-definition stage (Kuster et al., 2011), requiring continuous scope clarification during the team’s progress assessment.

Furthermore, the leadership of the project bears the responsibility for project cost, deliverables, and implementing control systems vital for project success, demanding a directive role. The emphasis here lies in minimizing ambiguity, providing structure, and simplifying the complexity inherent in new projects. Situations might arise where project goals need adjustment. To mitigate the impact of goal changes on the existing team dynamics, leadership must adopt a participative approach coupled with suitable motivational incentives.

A participative leadership style involves engaging the team in decision-making, allowing them to contribute suggestions to achieve the newly agreed-upon goals. This approach not only fosters collaboration but also ensures that team members are motivated and aligned with the project's evolving objectives. This will enable the harmonization of resources if the need arises for resources to be shared among team members. Thus, once the team are involved

in defining the goals and objectives of the project there will also be a productive utilization of resources.

Another area that the leadership must clearly define goals and objectives is in the protection of intellectual property transfer (Atesmen, 2015). If this is not specified, the project team might allow access to information that are solely confidential to the team. The objectives of the project can also include the need to provide training for all team members, and this can entail adjustments to avoid complete disruption of the project timetable. If this objective is not set *ab initio*, there are tendencies of delays arising from key members of the team attending un-schedule conferences and workshops, which will impact negatively on project timing. Also, to be included in the project objectives is training team members to enhance presentation skills and other communication productivity tools. The objectives must include keeping every project record and documentations confidentially to minimise ambiguities in the scope, goals, and objectives of the project. When there is the need to condense the schedule without reduction in scope, the leadership can approach this need through both supportive and achievement-oriented behaviour.

Clarifying the Organizational Structure

The challenge in achieving successful projects often stems from the organizational structure defining roles and reporting lines. Micro-management from the organizational leadership can strongly influence leadership decisions and the project team's effectiveness, shaping both productivity and social interactions. Certain cultures, such as the Japanese organizational culture, prioritize group decision-making, enhancing productivity (Miroshnik, 2013).

Additionally, intellectual property within diverse teams, can be safeguarded, especially in mixed-culture collocated teams (Atesmen, 2015). It is essential for the organizational structure to clearly delineate the communication channels between leadership and team

members. Empirical findings emphasize the significance of group dynamics in project management (Kaulio, 2008), emphasizing the need to integrate leadership seamlessly into the team for a smooth workflow. This must be enhanced to bring leadership to the team, for a frictionless work process.

Different organizational structures are defined by the competing values framework (CVF) developed in Cameron and Quinn (2011). Organizational structures that are flexible in nature facilitates innovation by emphasizing employees' adaptability and creativity, encouraging affiliation, team membership, and support (Aiken & Hage, 1971; Cameron & Quinn, 2011). Cameron and Quinn (2011) propose a hybrid leadership structure, blending flexibility and hierarchy, as internal control and integration often necessitate such an approach. However, it is important that a hierarchical structure of leadership must enhance project quality through stringent process control. Within the team, a flexible structure is maintained to facilitate change management and adaptability. Here, the intricate connection between organizational culture, leadership style, cross-cultural dynamics, and team effectiveness becomes evident.

Developing Team Competence

One fundamental duty of a project leader is to improve the competencies in the team to ensure timely and successful completion within budget and scope. A common issue arises when team members lack the necessary knowledge, skills, or abilities to fulfill their roles effectively (Cobb, 2012). It falls upon the leadership to address these competence gaps early in the project cycle rather than later during execution. Therefore, choosing the right leadership style is essential in improving team members' abilities. Additionally, validating and verifying the contractor's work accuracy demands skilled personnel from the client who possesses the requisite competence (Atesmen, 2015). Project leadership also entails keeping the team updated on the application of advanced technology to enhance productivity and manage the

scheduled project actions/activities within constraints, such as budget and technology (Atesmen, 2015).

Moreover, from the perspective of psychology, effective leadership involves managing employee emotions. Providing praise and support can alleviate negative emotions, ensuring that individual team members' productivity is not hindered by emotional factors. Thus, it is crucial for the project leader to not only address competence gaps promptly but also maintain a positive and supportive environment to enhance the team's overall performance. It is equally essential to ensure that team members have suitable soft skills and allowing them to make presentations on behalf of the team can encourage them to exhibit ownership. The project leader must meticulously prepare the team to identify mistakes and issues needing the attention of the leadership (Atesmen, 2015). If the productivity of any team member is low, the project leader encourages the employee to perform at optimum level. Thus, the style of leadership adopted can be linked to the level of innovation and creativity.

Facilitating knowledge sharing is essential for team performance. This includes urging team members to attend conferences and engage with experts, preventing redundant efforts. Project leaders may face challenges with uncooperative team members, prompting the creation of a competitive environment to foster knowledge sharing and innovative interactions. Consequently, effective project leadership demands experienced leaders capable of guiding teams toward high performance, ensuring a collaborative and innovative atmosphere among team members.

Demonstrating Ownership

Through consultation and delegation, team members are allowed to participate in decision making, and develop a feeling of ownership (Atesmen, 2015; Yukl, 2013). Literatrure equally suggests that involving team members in decision-making process achieves three main goals (Katzenbach & Smith, 1993, 2001): (i) optimising the leadership capability, (ii) team

members are able to build decision-making capability and (iii) the team takes ownership and accountability for the decisions made. Entrusting team members with superior task can increase their confidence and self-efficacy. This approach to team-centered leadership can enable the leader to recognise the importance of each team member based on competence, and the impact of their absence from the team on productivity.

Hiring skilled personnel is time consuming, hence the need to ring-fence members critical to the success of the project. Conflicts must be resolved through discussion (Atesmen, 2015). Briefing new members on the schedule, cost structure, and status also makes them have the feeling of being recognised by the leadership. Except where impossible, the project leader must allow for long transfer period when a member of the team is leaving and a new one is to be engaged. Several team meetings can be helpful in clarifying and explaining the position of the organization on project issues.

An effective project leader is one who propose but do not dictate on the approach to problem-solving, while explaining how the proposed approach can led to optimization of the schedule. All project-related change management process should include the inputs from the team, and there is the need for user-friendly project documents to reduce friction and access to information. The project leadership must accentuate that the implementation time of every suggested improvement on project activities should enhance project value. Team buy-in is decisive, and can be achieved through open-minded leadership that avoids isolating members from significant project decisions.

The relevance of every decision to the current issue should be assessed, informing team members why their suggestions were accepted or rejected. This transparency encourages continued participation. In the final stages of projects, teamwork is utmost. Leaders must deter social loafing and workers' job-related strikes, manage time efficiently, utilize effective international teleconferencing, and distinguish critical tasks from non-critical ones. Effective

communication methods and recognizing the importance of each task are vital components of project leadership, ensuring a cohesive and productive team dynamic.

Team performance can drop significantly while awaiting change and modifications to schedule and scope, hence the need to attend to changes early (Atesmen, 2015). This way, the leadership can improve the readiness of team members in accepting uncertainties, such as role changes or the need for extended work hours. Though it is important to enhance the feeling of ownership through delegating to subordinates, the project leadership must not be too demanding on subordinates by engaging adequate resources.

Enhancing Team Productivity

A successful team is made up of the task, the people, and leadership. Leadership evaluates team performance through factors such as training needs, relationships, reliability, stress management, knowledge, attitude, integrity, work quality, ambition, attendance, and communication (Atesmen, 2015). Projects can be commissioned before the actual schedule date if the performance of the team is improved through achievement-oriented leadership.

Achievements can be enhanced through proper scope definition (directive), providing support to the team, and a participative decision-making process that is all-encompassing. These active roles of the project leader have been defined within the P-G leadership theory. Unsing work breakdown structure (WBS) approach, achievement-oriented leadership demands prioritization of the project activities that are on the critical path. Effective team leadership is possible when the characteristics of the leader is agrees with that of the team (PMI, 2017). Hence, the characteristics of the adopted leadership style must align with that of the project team.

Through affective commitment, the leadership must interpret the need of the team accurately and respond in a dynamic manner to the requirements of the situation as evident in the conceptualization of the path-goal leadership approach (Polston-Murdoch, 2013). To avoid

the use of coercive force, the project leader can adopt both group and interpersonal communication with the team and encourage participative intervention suggestions from team members. The need to re-evaluate the capability of both human and material resources to meet project deadlines is important because it demonstrates the readiness of the leadership to achieving early project delivery.

The leadership can improve team performance by demonstrating positivism, enthusiasm, optimism and being realistic. Critical to productivity is the phasing of tasks, downsizing of the workforce and project shutdow when the need arises to reduce cost. To enhance team productivity, the project leadership can identify members of the team that need handholding and set up a program to support their growth at the start of the project. The project leader must be calm and versatile in the ability to handle unexpected events (Atesmen, 2015). Even, when the team performance is below expectation, the leadership must have the necessary anger control mechanism not to disgrace the team. Efficient performance review meetings are the backbone to team effectiveness (Kloppenborg, 2015).

Empirical results suggests that the leadership can influence the performance of a team (Cobb, 2012; Cobb & Hackman, 2003). Hence, it is important that change in leadership during the execution phase of the project is minimised to prevent lack leadership continuity, because the leadership process is psychological in nature and involves interpersonal bonding.

Improving Incentives

The literature (Levy, 2018; Vazquez, 2019), suggests that team performance can be enhanced through the provision of sufficient short-term or long-term incentives. A responsibility of the leadership to recognise exceptional performance and motivate high performing teams through rewards. It is also important that team members are advised to keep their remunerations confidential, as comparing salaries can discourage employees who feel they should be compensated more (Atesmen, 2015).

Minimising the Negative Effects of Social Cultural Factors

The project leader must attend to social-cultural factors. These include allowing team members to observe their national and religious holidays (Atesmen, 2015), and these must be factored into the programming of leave and absence period. Absence planning enables the project leader to take proactive approach in scheduling the work process, so that the absence of any team member will not impact negatively on the schedule. Cross-cultural differences can affect the progress of the project negatively, especially in communication except the team overcome this early. In the section on cross-culture, the dimensions of cross-culture influencing social cultural factors will be discussed extensively. This is often measured with the level of group experience, which is a dimension of project team effectiveness (Wageman et al., 2005). Implying that low score in group experience is an indication of poor team cohesion.

Justification for Adopting Path-Goal Leadership Approach

This section presents the justification for adopting path-goal leadership theory as the mediating leadership approach. Project team leadership domains according to PMI (2017), are presented in table 2.7, and matched with the leadership styles studied in projects, as discussed earlier.

Table 2.7

Matching project leadership styles with PMI criteria

PMI Criteria (PMI, 2017)	**Leadership Styles**			
	Authentic	**Transactional**	**Transformational**	**Path-Goal**
Guide, inspire, and collaborate using relational power	Balanced processing	-	Individualised consideration	Directive; Supportive; Participative
Develop	-	-	Intellectual stimulation	Achievement-oriented
Innovate	-	-	Intellectual stimulation	Achievement-oriented
Focus on	*relationships with*	*people*		Balanced

processing; - awareness	Self	- ndividualised	I c o n si d er at io n	Supportive

Inspire trust	Relational transparency	-	Idealised influence	Participative
Long-range vision	-	-	Inspirational motivation	Achievement-oriented
Ask what and why	-	-	Intellectual stimulation	Participative
Focus on the horizon	Internalised moral perspective	Contingent reward	Idealised influence	Directive
Challenge status quo	Internalised moral perspective	Contingent reward	Intellectual stimulation	Achievement-oriented
Focus on vision, alignment, motivation, and inspiration	-	Contingent reward	Inspirational motivation	Achievement-oriented

Appropriate leadership style is needed to gain the desired performance-related response from the team (Müller & Turner, 2007). Table 2.7 confirms that transactional leadership is more skewed towards effective management than leadership (Lowe et al., 1996b). Both transformational and path-goal leadership fit into the characteristic description of project leadership. It is suggested that the transformational leadership theory did not consider the impact of tasks and the level of socio-interaction on leadership effectiveness (Lowe et al., 1996b). Hence, the path-goal leadership is adopted in this research because of more focus on team development at the task and interaction level, which is possible with the different leadership styles. Implying that the four leadership styles of the path-goal theory can be exercised simultaneously depending on the project demand.

Again, in a paper presented at the Project Management Institute (PMI) in 2011 at Dallas, North America, Margules (2011) identified six leadership styles that can lead to exceptional project execution, comprising (i) visionary leadership, to provide future-driven attainment of the common goal; (ii) affiliative leadership, for a more humane-oriented

leadership that creates a harmonious work environment; (iii) coaching leadership behavior to improve team competencies; (iv) participative leadership, to create and build the spirit of

commitment and innovative creativity; (v) directive leadership, to enhance focus on the bottom line and project quality through regulatory policies, standards, and procedures; and (vi) pacesetting leadership behaviour to enhance achievement-driven productivity.

The above leadership styles resonate with the adopted path-goal leadership theory in this investigation as follows.

Table 2.8

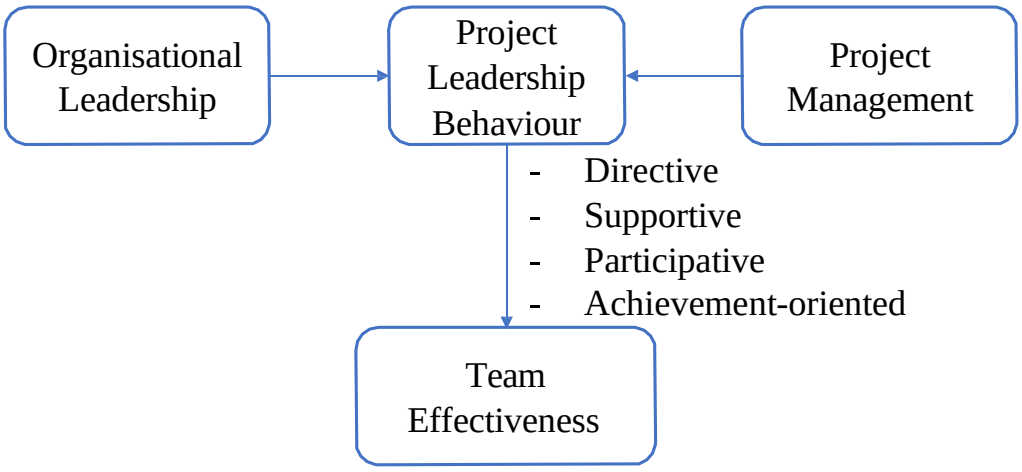
Matching project leadership behaviour in Margules (2011) with P-G *leadership attributes (Umuteme & Adegbite, 2022, p. 191)*

Project Leadership Styles (Margules, 2011)	**Path-Goal Leadership Theory Styles**
Visionary	Achievement-oriented
Affiliative	Supportive and Participative
Participative	Participative
Coaching	Supportive and Directive
Pacesetting	Achievement-oriented
Directive	Directive

In coroboraing the position in Polston-Murdoch (2013), path-goal leadership styles can boost team members' psychological well-being, promoting top-quartile performance and overall employee satisfaction. Thus, project leadership is conceptualised in this doctoral research as indicated in Figure 2.5 below.

Figure 2.5

Conceptual overview of team-related project leadership behaviour



As indicated here, the project leadership is responsible to the organizational leadership and project manager. The role of duty should focus more on achieving the project quality (scope, cost, and time) through the effective utilization of human resources. Hence, the emphasis is on team leadership. In an extensive review by Ahmed, Azmi, Masood, Tahir, and Ahmad (2013, p. 6), it was suggested that project leadership requires "essential leadership and managerial knowledge, skills, competencies and characteristics" for enhanced project delivery. Hence, in my opinion the role of the project leader is too sensitive to be placed under the project manager. This is to ensure there is effective team leadership throughout the project duration. From a cross-cultural perspective, the effectiveness of the adopted leadership approach is more demanding because of the emphasis on team Cohesion.

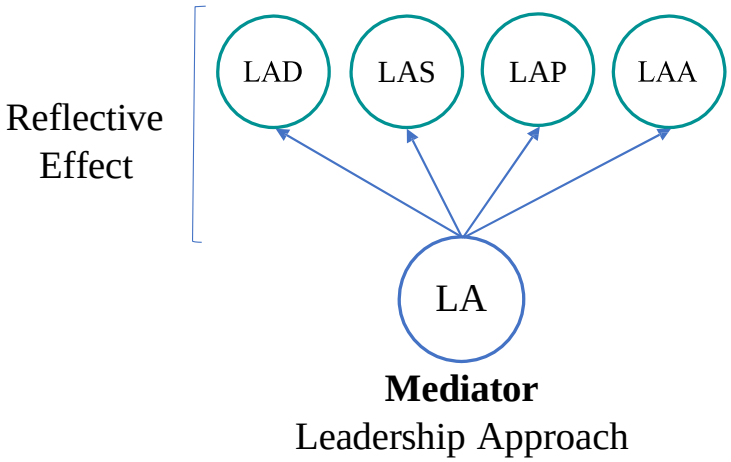
A suitable leadership approach has been chosen to mitigate cross-cultural factors' impact on team effectiveness. The leader's behaviour is pivotal in maximizing each team member's potential. The analysis will concentrate on identifying the highly-rated leadership style and its influence on cross-culture, organizational culture, and team effectiveness through correlational matrices.

Leadership Approach Construct

In this study, a reflective construct is adopted for the leadership approach as a latent variable in the structural equation model and coded as "LA" in Figure 2.6.

Figure 2.6

Measurement variables of the path-goal leadership approach



As seen from the discussions above, the leadership approach is not a sum of all the leadership styles but reflects on the factorial loadings of the adopted leadership behaviour which is contingent on the assessment of task-subordinate characteristics. This construct can identify the high-rating leadership behaviour that influences the behaviour of the team. The coding of the dimensions using the "LA" and the first letter of the dimensions are as follows: directive (LAD), supportive (LAS), participative (LAP), and achievement-oriented (LAA).

Cross-Cultural Psychology

There are various definitions of culture starting from the early 1950s to date, but this thesis adopts the definition that, "culture is the collective programming of the mind that distinguishes the members of one group or category of people from others" (Hofstede, 2011, p. 3). An understanding that is based on the presence of *shared cognitive frames* (Schein, 2010), which are the psychological foundation of the dimensions of cross-culture present in project teams. Comparative studies of the effects of culture on human psychology suggests the existence of a positive relationship (Shiraev & Levy, 2010). Cross-cultural psychology is an established field of research since it gained attention in the 1960s and 1970s (Lonner, 2011).

Recent studies in cross-culture relates to the attitudes, norms, and values of a group, which are topics in social-psychology. Consequently, culture is defined, “the learned beliefs, values, rules, norms, symbols, and traditions that are common to a group of people” (Northouse, 2019, p. 434). Also, studies have shown that cross-cultural differences occur in project teams (Kirkman & Shapiro, 2001), and mostly informed by the effect of globalization on 21st century organizations (Ajayi, 2020; Kuster et al., 2011). Despite the opinion by some researchers that cross-cultural differences will disappear in the future because of globalization, there are still not enough studies to support this proposition (Lonner, 2011).

In effect, studies have shown that workers in an organization are align more to the values of the cultures of their originating country than that of the organization (Hofstede et al., 1990). This outcome is worrisome with the reality of globalization for the project team leadership as there is the possibility of relational friction from social and task interactivity among members of the team due to different cultural orientations. This research investigates cross-cultural aspects: (i) examining cross-culture's impact on team effectiveness, (ii) identifying high-rating dimensions in Nigerian oil and gas project teams, (iii) assessing how cross-cultural differences affect project leadership, and (iv) analyzing how organizational culture influences cross-culture's impact on leadership and team effectiveness. Answers to these queries will conclude the study.

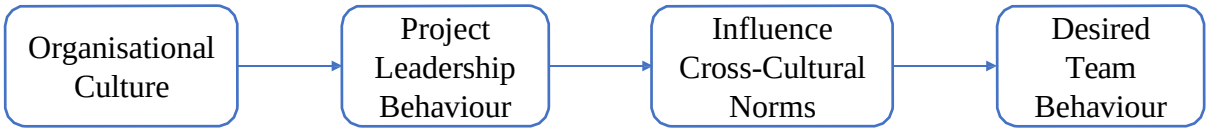
Sources of cultural differences have been identified to include parenting strategies in different societies, cultural institutions such as schools and religion, inherited genetic programming and other environmental factors (Hofstede et al., 1990; Lonner, 2011). Although cross-cultural studies linking the environment to the behaviour of the individual are not conclusive, there are indications of positive relationship between both concepts (Lonner, 2011). Since *norms* are used to regulate the behaviour of the team (Lonner, 2011), it is important to

understand how project leadership can instil a common acceptable set of norms within the team that can enhance team effectiveness.

These norms are related to environmental factors in this study, which include the organizational culture, leadership approach and technical nature of the projects in the industry of study. Hence, the focus of this section is to identify the dimensions of cross-culture in the literature that identifies the norms that are present in project teams, and how these norms can be enhanced through their association with other measured variables in the study construct. Figure 2.7, below presents how the project leadership style can introduce the desired norms to achieve the expected behaviour of team members.

Figure 2.7

Relationship between organizational culture, leadership behaviour, cross-cultural norms, and desired team behaviour



Dimensions of Cross-Culture

Dorfman et al. (2012) findings indicate that addressing workplace cross-cultural challenges is possible through a leadership approach promoting collaboration, team integration, humaneness, and participative leadership. Though research indicates that Nigerians prefer a humane-oriented leadership (Dorfman et al., 2012), which is expected to define the norms in the leader-follower relationship, the reality is that project teams in this industry are multicultural.

This section discusses the varied interaction of project leadership with cross-culture and identifies a logical and ordered way of delineating and measuring the dimensions of cross-culture. Having a universal set of ordered measures for cross-cultural dimensions is difficult because “cultures are moving and changing entities” (Lonner 2011, p. 67), and shapes organizational practices (Aycan, 2000; Gelfand et al., 2007).

Varied competences and professions in the team influence planning, diversification, and role differentiation within the team (Aycan, 2000). Cross-cultural theories has improved the understand of organizational behaviour from different cultures and the globalization of organizational practices (Gelfand et al., 2007). Equally, the dimensions of cross-culture influence the performance of individual members of a team. Hence, team performance management starts with setting the goals and determining the key performance indicators (Aycan, 2000), to drive the organizational commitment of every member of the team (Gelfand et al., 2007). For instance, collectivist culture prefers participative goal setting to achieve higher performance (Aycan, 2000). Implying that in teams with variance of members from both collectivist and individualist cultures, the tendency of friction in goal setting is obvious. Therefore, to prevent biases in assessing the behaviour of individuals by other team members from their traits, as expressed in the implicit personality theory (Rosenberg & Sedlak, 1972), it is important to have a set of norms that defines the expected workplace behaviour and can enhance the performance of every member of the team.

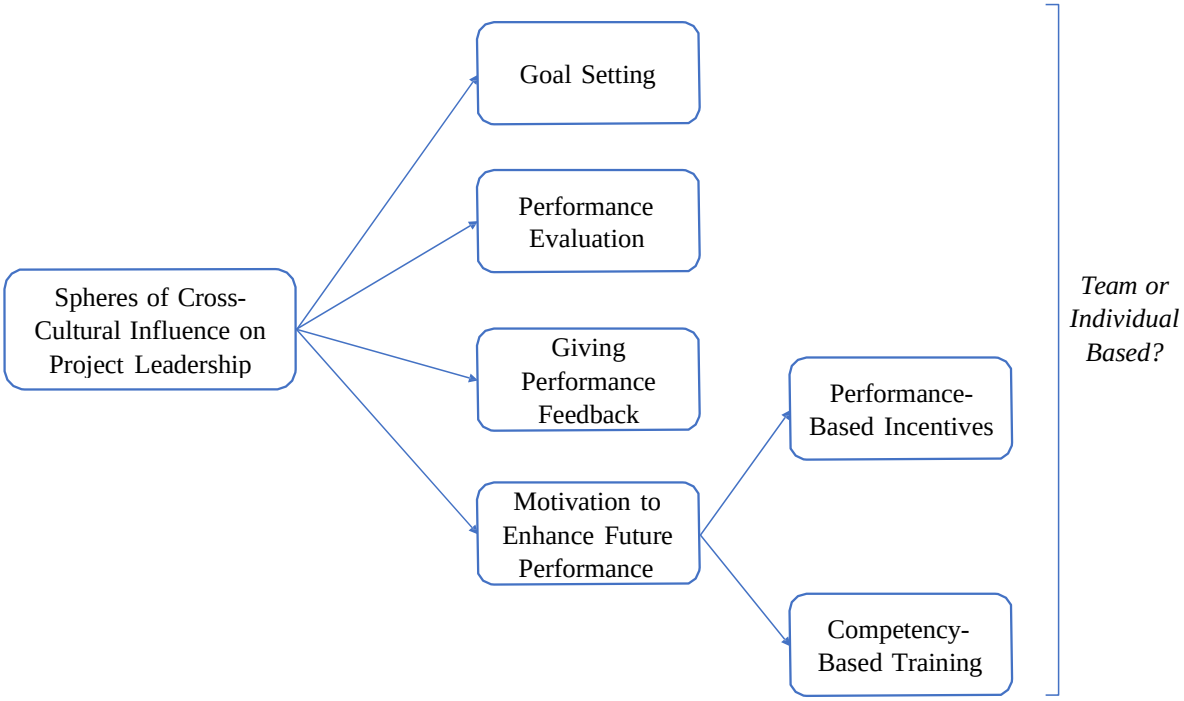
Again, in associative/diffuse cultures where people view feedback on job performance as a reflection of their personality, leaders might avoid giving negative feedback not to reduce the self-esteem of the individual (Aycan, 2000). The approach employed in recommending a team member for performance-based rewards/incentives or further competency improvement through training also varies from cultures to culture.

In collective cultures, performance-based reward is given to the entire team as a distinct entity; in individualistic cultures, one-on-one reward is highly motivating (Aycan, 2000). Collective cultures are characterized by a strong emphasis on group identity, interdependence, and cooperation. In such cultures, individuals perceive themselves as part of a larger whole and prioritize the success and harmony of the group. Consequently, performance-based rewards are often given to the entire team as a distinct entity. This approach reinforces the collective nature of the culture, fostering a sense of unity, collaboration, and shared responsibility. The rewards serve as recognition for the collective effort and encourage continued cooperation among team members. It reinforces the notion that success is a result of collective contribution rather than individual achievements.

On the other hand, individualistic cultures prioritize personal goals, independence, and individual achievements. These cultures encourage competition and self-reliance. From the discussion so far, the interaction of project leadership with cross-culture in the team is presented below as detailed in Aycan (2000).

Figure 2.8

Spheres of cross-cultural influence on project leadership decision



In such contexts, one-on-one reward systems, where rewards are given directly to individuals based on their individual performance, tend to be highly motivating. Individualistic cultures place importance on personal accomplishments, and receiving personal recognition and rewards reinforces the sense of achievement and self-worth. It encourages individuals to strive for excellence and stand out among their peers.

Furthermore, in fatalistic cultures, where people view their job performance as being driven by an unseen force, performance-based incentives might not really improve performance (Aycan, 2000). Hence, the leadership must understand the dominant cross-cultural dimension before deciding on which approach to adopt in goal setting, performance evaluation and giving performance feedback to the team. Moreover, the influence of culture on reward systems may vary in different organizational settings, as organizations can have their own unique cultural norms and practices.

As discussed earlier, studies suggests that cross-cultural dimensions positively impacts the effectiveness of teams in an organization (Bitsani, 2013). Four dimensions of cross-culture

associated with this thesis as defined in the literature (Hofstede et al., 1990), include: uncertainty avoidance, power distance, individualism versus collectivism and long-term versus short-term orientation. These dimensions will be discussed below.

Power Distance

Power distance (PD) in a cross-cultural environment is defined by Hofstede as "the extent to which the less powerful members of institutions and organizations within a country expect and accept that power is distributed unequally" (Hofstede 2011, p. 9; Minkov 2013, p. 206). In this investigation, it is defined as a measure of the degree by which individual members of a project team expect that decision-making power is disproportionately distributed.

When there is large power distance, the project leadership takes all the decisions and acting as *mentor, expert, and facilitator* (Miroshnik, 2013). It has been suggested in the literature that the emotional intelligence level of team members is directly related to team outcomes (Prati et al., 2003). This is because, the emotionally intelligent team members understand the need to adhere to the norms of teamwork and will moderate their emotions to enhance team cohesiveness. Since the project leadership motivates the team towards a collective action (Prati et al., 2003), high-power distant culture teams might lack the necessary norms to control individual emotional outburst in the workplace.

Again, empirical results suggests that the impact of cultural differences on power distance varies across the globe (Hofstede, n.d.; Smith et al., 1995). High score in power distance means strong influence of hierarchy (Hofstede, 2011), and encouraging more of directive leadership. In low power distance project team culture, a participative leadership is expected to yield ultimate productive output because the leadership is decentralised. The results of the exploratory empirical study conducted in the literature (Eylon & Au, 1999), suggests that power distance is related to empowerment-driven productive performance. Implying that project team members from high power distance cultures are likely to perform less than

expected compared with team members from low power distance cultures. Hence, the leadership approach across the team is likely to vary depending on the characteristics of the task and the dominant characteristics of the team member(s) completing the task. Power distance is operationalized in this study as the existence of inequality from top to bottom of the leadership hierarchy.

When the model developed in the research is applied in auditing a project team as the work progresses, the leadership can map the expectation of the team to the right leadership style. This is one of the reasons why a PLS-SEM method was implemented to harness the advantage of having closed-ended survey inputs from as low as 50 participants. Using a measurement scale of 1-5, if the mean score is greater than 3, then the power distance is high, and if lesser than 3 then the power distance is low. Table 2.9, provides the possible impact of power distance on the team productive output.

Table 2.9

Relationship between power distance, empowerment to make decision and leadership behaviour

Power Distance Culture	Team Member Right to Make Decision	Team Productive Output	Work Scenario	Literature
Small	Empowered	High	Lower pressure for conformity; freedom to question leadership	(Eylon & Au, 1999; Kirkman & Shapiro, 2001)
Large	Not Empowered	Low	Long-Term job: Pressure for conformity; less freedom to question leadership	

From Table 2.9, the relationship between power distance and the team productive output is determined by the culture and the level of empowerment from the leadership approach. Empirical report in the literature (Huang et al., 2005), suggest that active employee's involvement in decision making is possible in some high-power distant cultures where there is strong participative leadership work environment.

However, the research did not report the impact of this association on productivity. As seen from Table 2.9, above and corroborated in the literature (Oruh & Dibia, 2020), a high-power distant culture encourages master-servant relationship in the workplace. Though employee productivity might be high, there are likely negative impacts of this high-power distant culture including high employee stress level, low job satisfaction and poor work-life balance (Oruh & Dibia, 2020).

Uncertainty Avoidance

Uncertainty avoidance (UA) is defined as "the extent to which a society, organization, or group relies on social norms, rules, and procedures to alleviate unpredictability of future events" (Hofstede, 2011, p. 3). It measures the level of a team's readiness for uncertainty and ambiguity (Shiraev & Levy, 2010), and the level of stress in a project team in when the future is uncertain (Hofstede, 2001, 2011). Thus, the need for clarity of roles as the project progresses due to changing project environment. Implying, if a team member is on leave, how does this affect the roles of other members. Since it is the duty of the leadership to substitute a new member of the team into the vacant role, this dimension measures how ready the team members responded to future role-changing events. This dimension is operationalised in the investigation as the consistent need for clarity of roles and structure of the team, where the score suggests the level of tolerance to ambiguity in individual roles and the structure of the team.

Consequently, project leaders must introduce the required behavioural norms in combination with the appropriate leadership behaviour to mediate the influence of this dimension PTE. Project team's culture with strong uncertainty avoidance prefers are deference to established behavioural codes of conduct and need continuous clarity on individual roles and team structure (Hofstede, 2011). Low level of uncertainty avoidance has been reported in the literature (Geletkanycz, 1997) when the leadership style is appropriate and stable.

Also, Geletkanycz (1997) suggests that uncertainty avoidance is highly associated with power distance, and very low positive association with team performance. Implying that high power distance reduces the feeling of job and role stability in project teams, and that the effect on team performance can either be positive or negative, depending on other factors responsible for the motivation of team members. The mapping of uncertainty avoidance to power distance is as defined in Schein (2010), because both dimensions are related to organizational performance.

Low score in uncertainty avoidance simply implies readiness to accept uncertainties. When there is low productivity due to high uncertainty avoidance in low-power distance culture, then the source of the uncertainty is external to the organization, such as when there is high anxiety level in a country (Schein, 2004) or triggered by low price of crude oil. Nigeria is a high-power distance and weak-uncertainty avoidance culture. Hence, team members who are Nigerians can be emotional towards their jobs and can be motivated by personal drive for success to retain their job, and more willing to adapt to the norms for productive behaviour.

Though, they might not be influenced beyond their emotional dictates using emotional intelligence as a tool for motivation (Miao et al., 2020), a leadership style that is high in emotional intelligence can improve their productivity (Prati et al., 2003). To drive innovation and performance, there is the need for the leadership to bond emotionally with the emotional need of the follower through affective commitment (Polston-Murdoch, 2013; Zhu et al., 2013). However, the appropriateness of any of the path-goal leadership styles will be determined by the correlation between uncertainty avoidance and each of the leadership styles to determine the relative strength of the association, and then associated with the productive output of the team.

Individualism - Collectivism

This dimension relates to the incorporation of individual members into primary groups based on some defined characteristics (Hofstede, 2011). Individualism can be referred to as the complex behaviour exhibited by the individual preferring the actualization of personal goals than the goals of the team, while collectivism refers to the behaviour of an individual reflecting the values and tradition of the team (Berry et al., 2002; Shiraev & Levy, 2010). Hence, emotions of independence (e.g., pride, self-centeredness) are visible in individualistic culture in project teams.

Again, those from individualistic cultures prefers competitive performance strategies, unlike collectivist culture prefers performance strategies that enhances their cohesiveness and interdependence (Shiraev & Levy, 2010). Again, Geletkanycz (1997) suggest that collectivism is positively associated with both low power distance and high performance. Empirical results in another literature (Kirkman & Shapiro, 2001) suggest that collectivism promotes commitment to high team performance in low-power distance culture. Wolman (1956) suggest that high team performance is achieved when the group accepts the leadership behaviour as well as the orientation of the task. Implying that the characterises of the team can define the style of leadership and the level of power distance.

This domain has been operationalised in this research as the *existence of in-group and out-group, and relationship prevails over task.* Low score on this dimension is related to *individualism*, while high score is related to *collectivism.* Midway score would mean the presence of both culture in the team, and the most suitable leadership style will be determined by the ability of the leader to split the team into both individualistic culture and collectivist culture. Suggesting that those from individualistic cultures can be put into roles of professional experts, such as chief engineers, who adhere strictly to standards of construction. In some cases,

though the power to alter the design resides with the principal engineer in the team, the final decision relies on the approval of a constituted change control body outside the team.

Long Term - Short Term Orientation

This dimension is highly linked to productivity and economic growth (Hofstede, 2011), hence an important aspect in project team effectiveness. Long-term oriented cultures plan for the future unlike short-term oriented cultures that prefer instant gratification than saving for the future (Hofstede et al., 2010). Empirical evidence suggests that the motivation for long-term orientation is "thrift" (Minkov, 2013). Hence, team members from long-term oriented cultures will value relationship building behaviours to sustain their current job to achieve self-stability and enhance personal gratification (Minkov, 2013), through saving for the future. Implying that the members of the team are willing to accept new roles and work till the end of the project by employing strong emotional intelligence in controlling emotions that are counter-productive to project success (Miao et al., 2020).

Consequently, the team members display adaptability and commitment by embracing new responsibilities and remaining dedicated until the completion of the project. They effectively utilize their emotional intelligence to manage unconstructive emotions that could hinder progress. By fostering self-awareness and empathy, they navigate challenges with composure, maintain positive relationships, and cultivate a harmonious work environment. This emotional intelligence empowers them to handle conflicts, stress, and setbacks, ensuring that the team remains focused and resilient. Ultimately, their willingness to embrace change, coupled with their ability to control counter-productive emotions, enhances their productivity and drives the project to a successful conclusion.

In this study, high agreement with the presence of adaptation to change favours long-term orientation (Hofstede, 2011). Hence, this dimension has been operationalised in the investigation as *adaptation to change.* Nigeria is a long-term orientation cross-culture

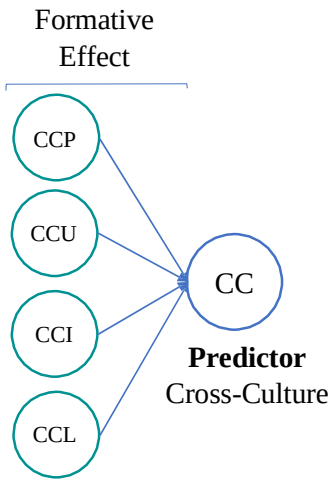
(Hofstede, n.d.), hence the possibility of seeing team members working till the end of the project schedule, and willing to follow the project leader to resume in another project is high.

Cross-Culture Construct

A formative construct has been adopted for cross-culture as a latent variable in the structural equation model developed in this study and coded as "CC" in Figure 2.9. As seen above, cross-culture is dependent on the dimensions measured.

Figure 2.9

Cross-culture formative construct



The coding of the dimensions using the "CC" and the first letter of the dimensions are as follows: uncertainty avoidance (CCU), power distance (CCP), individualism versus collectivism (CCI), and long term versus short term orientation (CCL).

Organizational Culture

Several definitions of culture have been critically discussed in the literature (Jahoda, 2012), where the author concluded culture should be studied based on the context of application. In this study, the context of application is related to the psychology of the workplace, with emphasis on influencing the mind and behaviour of team members towards achieving the goals of the project. Earlier, culture was defined as "the learned beliefs, values, rules, norms, symbols, and traditions that are common to a group of people" (Northouse, 2019,

p. 434). Also, (Schein, 2004, p. 17) explained organizational culture "as the accumulated shared learning of a given group, covering behavioural, emotional, and cognitive elements of the group members' total psychological functioning." Cultural norms are defined by the integration of behavioural patterns, and to enhance the sustainability of the organization through a stable and consistent sets of assumptions from where leaders and team members derive meanings (Schein, 2004).

Previous studies in organizational culture have investigated its relationship with other variables that influences performance, leadership behaviour, motivation, and employee job satisfaction. Organizational performance deals with effectiveness and efficiency (Daft, 2012; Jones & George, 2016); relating to how the managers achieve the goals of the organization through the efficient utilization of resources. This is where organizational culture is related to team effectiveness. The increasing studies in organizational culture indicates that the study of global culture is important in the sustainability of future organizations, when linked to performance (Schneider et al., 2013).

In a related literature, Tsai (2011) investigated the link between leadership behaviour, organizational culture, and job satisfaction by analysing data from 200 closed-ended survey questionnaire that was collected in a cross-sectional time horizon. The outcomes suggests a positively significant link between organizational culture and leadership behaviour, and between employee job satisfaction and leadership behaviour. Thus, a relationship linking organizational culture, leadership approach and team performance can be established from this thesis with strong emphasis on participative and supportive leadership, and external customer focus culture.

Similarly, some empirical findings have suggested positive and significant corelation between organizational culture and: (i) knowledge management (Klepić & Madžar, 2017); (ii) business unit performance based on adaptive and achievement-oriented culture (Xenikou &

Simosi, 2006); (iii) corporate performance (Tedla, 2016); and (iv) employee job satisfaction and commitment (Lok & Crawford, 2004). Understanding culture is equally important in developing performance improvement training programs, as employees from different cultures learn differently (Spector, 2012).

Also, the need for a sustainability-driven organizational culture was advocated at the 25th Nigerian Economic Summit (NES, 2019), to sustain organizational vision through the years ahead. Thus, laying the emphasis for investigating how organizational cultures can sustain long-term economic growth and productivity. In the studied industry, the dynamic interaction of CCD with OC is complex due to globalization. Yet, it is essesntail that leadership promotes this interaction. Nevertheless, because the organizational culture inflences the adopted leadership style, this can potentially impede effective management of cross-cultural aspects within the project team.

Earlier, it was observed that cross-culture depends on the leadership approach in defining the power distance and uncertainty avoidance domains (Minkov, 2013), which later affects other domains of cross-culture. To strengthen the dynamic nature of the organizational culture, some suggestions have been outlined in the literature (Willcoxson & Millett, 2000), including engaging the right employees, enhancing socialization, performance rewards and incentives, a participative leadership approach that recognises the universality of cultural diversity in driving the organizational vision and mission, and the consistency of organizational policies with workplace culture. Similarly, empirical results in the literature (Ehtesham et al., 2011), suggests that the promotion of job security and internal career development in an organization can enhance cultural interdependency with a positive influence on the cohesiveness of the team; thus, improving organizational performance.

Culture is difficult to explain (Willcoxson & Millett, 2000), and this has led to various academic disciplines becoming involved in providing insights into the sociological,

anthropological and psychological aspects of culture from their observational perspectives (Miroshnik, 2013). Culture is a complex and multifaceted phenomenon, making it challenging to succinctly define or explain. It encompasses a wide range of values, beliefs, customs, and traditions that shape the identity of a group or society. Culture is deeply embedded in the collective consciousness and influences behaviors, social norms, and interpersonal relationships. Its intricacies lie in the interplay between historical, geographical, religious, and societal factors, which vary across regions and evolve over time. The richness and diversity of culture defy simple explanations, requiring in-depth exploration and understanding to grasp its true essence. On the multiplicity of global cultures, Hall (1989) suggests that there is the need for the world to transcend the limits posed by individual cultures.

Consequently, it is important that the influence of individual cultures in a project team must be mediated by appropriate LA and moderated by the OC. Implying that the individual team member must recognise and accept that there are various hidden aspects of culture that stimulate the performance of the team (Hall, 1989). These hidden dimensions of culture have been studied from the individual level, group level, organizational level, and national level Hall (1989). The influence of cultural assumptions are evident in professional meetings (Schein, 2004). Implying the presence of cultural assumptions in every sphere of human endeavour. What is important in this doctoral research is how the dimension of organizational culture influences the performance of project teams.

Within the context defined in this research, organizational culture is expected to moderate any significant cross-cultural variability in the project team, to reduce the influence on the team effectiveness, with or without leadership mediation. Low moderation influence of OC on the measured variables of CCD implies that the influence of CCD is positive on the PTE, and equally suggesting that the team culture is aligned with the organizational culture in

the order of ranking. The next section will discuss the how organizational culture develops, and the influence of the workforce in this development process.

Organizational Culture Development Process

The importance of this section is the link between organizational culture and the leadership. Culture shapes shared values and behaviours, and is nurtured from the top (Heskett, 2012). The need for a change in the existing culture is driven by the need for high performance. Thus, the link between culture and leadership behaviour demands the stability of leadership approach in projects (Heskett, 2012), to sustain longer-term sustainable changes. The relevance of this indication to this study is the need for a stable leadership behaviour that can improve the effectiveness and performance of the team. A stable leadership behaviour can reduce uncertainty avoidance among individual team members (Geletkanycz, 1997). Therefore, it is important for the leadership to institute an organizational culture that will shape and enhance all manner of interactions in the organization.

Cultural changes are evident in organizations. First, hidden cultures are reflected in personality traits that are sometimes referred to as personality variables (Spector, 2012), which can influence the emotional outcome of the employee when there are workplace stressors, such as undertaking a complex and unstructured job. The continuous absence of a team member from work is infectious on other members of the group who might adopt the same approach to work (Mathieu & Kohler, 1990). Other studies have equally investigated social-loafing as detrimental to the productive output of a team (Heames & Harvey, 2006), although this shared culture might be wrong (Schein, 2004). The reduction in social-loafing has been linked to the presence of leadership, with increased member-member coordination (Forsyth, 2007; Williams & Karau, 1993). Second, change in office design, team size and membership, technology, and public image of the organization can change the behaviour of employees (Heskett, 2012).

Third, since culture change overt-time and it is not proper to adopt a set of rigid values and beliefs (Hall, 1989) in an organization. This is important in understanding that a culture that worked best in one project might not be wholly transferable to another project. Fourth, culture permeates the subsystems of any organization (Alvesson, 2002), hence the expected influence of OC on productive output of project teams. Implying that the interaction between the CCD in the project team, the OC, and the leadership behaviour must create a positive work climate for team effectiveness.

Hence, the dynamic nature of culture can be explained using the framework developed in the literature (Hatch, 1993; Schein, 2004). Both authors created a repeating bi-directional interactive model between the domains of culture: artifacts, espoused beliefs and values, underlying assumptions, and symbols. While Schein consistently identify the first three as the levels of culture, Hatch added a fourth domain - *symbols*. In trying to differentiate values from symbols, two aspects of the culture model were suggested in Hatch (1993), to include – action (values) and reflection (symbols). Organizational climate is a manifestation of some underlying assumptions (Schein, 2004).

Hence, the work climate in a project team is the visible manifestation from the reflection of individual team member on the artifacts and symbols. Therefore, it is important that the leadership behaviour sends the right message to every member of the team for an objective representation of the values espoused by the organization in their attitude towards team effectiveness.

However, one can argue that because organizational culture is not static there is the likelihood of *organizational de-formation* occurring when the system is unable to absorb the elastic energy and shock coming from external modifiers of culture, such as rapid change in technology, change in the demography of population, continuous environmental awareness, and litigations from host communities because of poor or the absence of corporate social

responsibility. *Organizational de-formation* impedes the competitive growth of the organization, and it is a term coined in this research to imply a non-dynamic cultural situation within the organization. Hence, implies that when the culture is static, the organization is deformed. The survival of organizations depends on how the leadership can measure the prevailing culture and take proactive action when it is anticipated that the outcome can negatively impact on organizational performance. Two main models of organizational culture are discussed next.

Models/Theories Of Organizational Culture

As discussed earlier, organizational culture involves beliefs, assumptions, and symbols of organizational members that define the process by which an organization conducts its business (Schneider et al., 2013). Organizational culture has the potential to influence the organizational environment, work habits, performance, productivity, and profitability (Linnenluecke & Griffiths, 2010), and effectiveness (Hartnell et al., 2011; Schein, 2004). Effective organizational culture can lead to the development of successful organizational strategy, effective organizational leadership, excellent employee performance, and ethical philosophy (Denison, 1990). In an effective organizational culture, members of the organization understand how to interact with various stakeholders, because organization culture covers a wide range of behaviours in the organization that aligns with the expectations of everyone (Schein, 2004). An effective organizational culture promotes understanding among team members on how to interact with stakeholders, as it encompasses behaviors that align with everyone's expectations and covers a broad range of interactions within the organization. The two theoretical models of organizational culture discussed hereafter are the Denison model and the competing values framework (CVF).

The Competing Values Framework

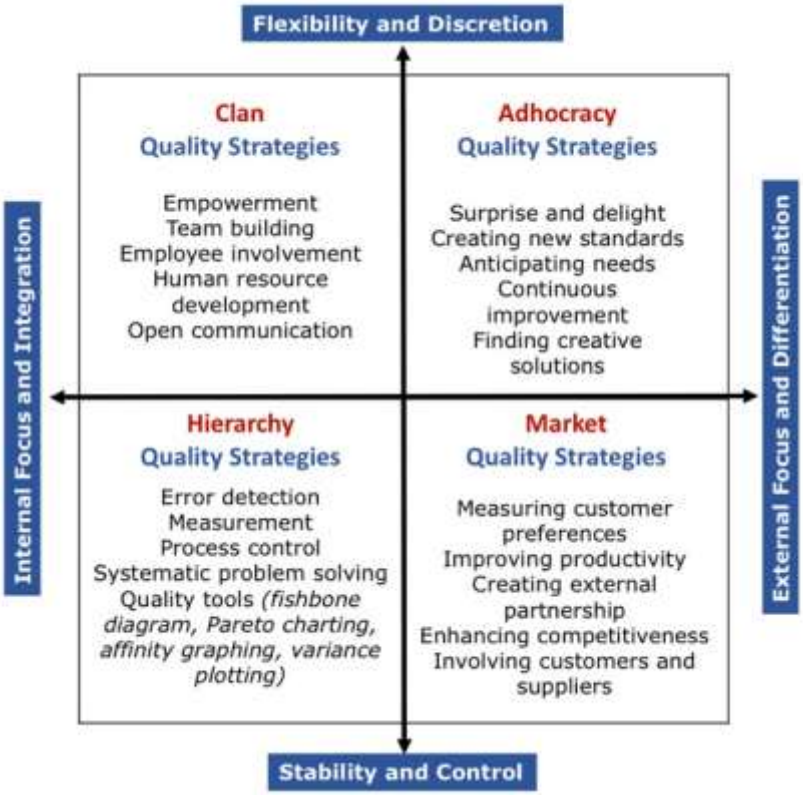
The CVF is a psychological construct that links organizational culture to observable behavioural patterns. For project activities, this is related to three basic elements that drives the productivity: the worker, the work, and the work environment. These behavioural changes in the workplace is explained using the CVF, as the most illustrative psychological model of organizational culture developed by Cameron and Quinn (2011). Empirically, the CVF was developed through the analysis of 39 indicators that related to organizational effectiveness. The resulting chart is comprised of two polarities.

On the horizontal axis is internal focus and integration on the left, and external focus and differentiation on the right. The vertical axis defines stability and control to the bottom and flexibility and discretion on the top. To achieve organizational effectiveness each quadrant was defined as presented in Figure 2.10 below. The clan culture is characterized by a collaborative and nurturing environment, where there is a strong sense of belonging and teamwork among the project team members.

In a clan culture, there is an emphasis on building relationships, open communication, and a shared commitment to the project's goals. This type of culture values the engagement of the employee, empowerment, and the advancement of a supportive work environment. On the other hand, a hierarchy culture is characterized by a more structured and formalized approach to project management. It follows a top-down approach, where authority and the power for decision-making are centralized on top of the hierarchy. In a hierarchy culture, there is a clear chain of command, well-defined roles and responsibilities, and a focus on following established procedures and protocols. When it comes to leadership attributes, the clan culture is expected to be positively related to the path-goal leadership approach. Suggesting that effective leaders clarify the path to help their subordinates achieve their goals and make the journey easier by providing guidance and support.

Figure 2.10

The CVF of total quality management (Cameron & Quinn, 2011, p. 57)



From the figure, the clan and hierarchy culture are more associated with project activities. From the indication and elements of the clan culture, it is expected that the clan culture will be positively related with the path-goal leadership attributes of supportive, achievement-oriented, directive, and participative.

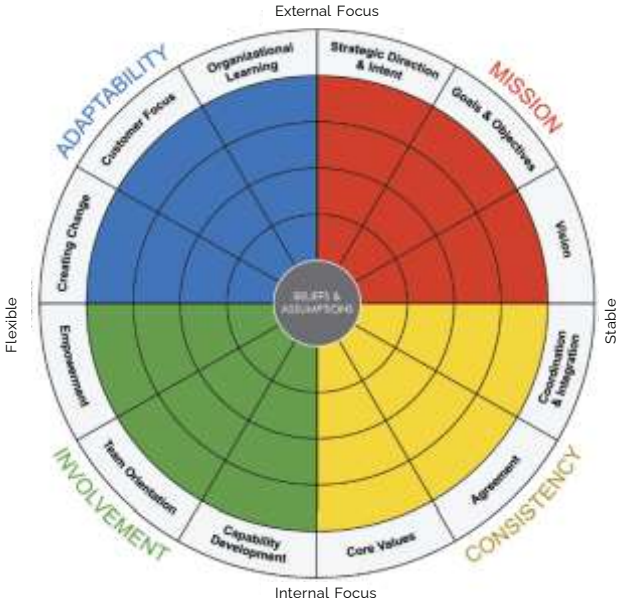
The Denison Model

The Denson model dentified the dimensions of culture that influences performance, growth, innovation, or organizational learning (Denison, 1990). The Denison model offers several advantages when applied to project activities. By aligning with an organization's goals, vision, strategic plan, and business intent, the model ensures that the project remains in sync with the overall direction and priorities of the organization. This alignment maximizes the project's chances of success by maintaining focus on the strategic objectives, leveraging

existing resources and capabilities, and minimizing conflicts with other initiatives. This model is illustrated by Figure 2.11, below.

Figure 2.11

The Denison model of organizational culture (Denison Consulting, n.d.)



Furthermore, the Denison model promotes a holistic approach that considers various factors such as culture, leadership, and communication, enabling a comprehensive understanding of the organization's context and facilitating effective decision-making throughout the project lifecycle. The Denison model presents four traits of organizational culture that are based on the following beliefs and assumptions: Mission, Adaptability, Involvement, and Consistency.

The model is similar in pattern to the CVF model discussed earlier by incorporating four opposite poles: *Internal versus external focus* on the vertical pole and *flexibility versus stability* on the horizontal pole. Internal focus underscores the need of achieving quality without compromising employee satisfaction; external focus is concerned with competitiveness through innovation; flexibility involves creativity and customer's satisfaction;

and stability drives the productivity and profitability. The basic comparison of both models is presented in Table 2.10, below.

Table 2.10.

Comparison between Denison and CVF organizational culture models

Quadrant	Denison Model	CVF Model	Relevance to this study
External focus – Stability	*Mission* – Defines the organizational goals and objectives. It explains the vision and strategic direction and intent. It questions the overall purpose of establishing the organization.	*Market:* Enhancing competitiveness by focusing on customer preference and satisfaction. This also defines the need for improving productivity and creating external partnership	Project activities are driven by organizational goals and vision, as an outcome of the strategic plan and business intent. Hence, the Denison model is selected.
External focus – Flexibility	*Adaptability: C*reating change and focus on the customer and enhancing learning.	*Adhocracy:* Creating new standards, anticipating needs, and continuous improvement.	Organizations engage in new projects to create change based on customer's need. Projects create learning for future projects. Therefore, the Denison model is more appropriate in this context
Internal focus – Stability	*Consistency:* Defines the core business values. Sustaining reputation through fulfilment of agreements. Enhancing coordination and integration.	*Hierarchy:* Error detection, process control, measurement standards	Projects involve several agreements and standards, with emphasis on reputation, coordination, and integration into existing organizational framework. The Denison model is more in line with expected outcome in projects
Internal focus – Flexibility	*Involvement:* This culture is team-oriented, with emphasis on empowerment and capability enhancement.	*Clan:* Team oriented culture with emphasis on empowerment and capability enhancement.	Projects are team-oriented and involves the need to empower team members and enhance capacity through knowledge sharing and on-the-job training. Both models are suitable in this regard.

From the comparison in Table 2.10, the Denison model is more suitable for this study. The relationship between organizational culture and the other three concepts will be discussed below. The discussion so far indicates that organizational culture is related to the other concepts – leadership approach, cross-culture, and project team effectiveness. Project delivery is positively related to a strong people-oriented leadership skills (Krahn & Hartment, 2006), which is defined by the existing organizational culture. Studies suggests that leadership behaviour in an organization can influence team members' effectiveness (Umuteme & Adegbite, 2023; Rego et al., 2016), with significant and positive association with organizational culture (Umuteme & Adegbite, 2023; Littrell et al., 2018; Tsai, 2011). Empirical observation in Fleishman (1973), suggests that pressure for output can increase grievance among the work force.

Hence, project team performance can be moderated by the right organizational culture, because the dominant organization culture is driven by the style of leadership (Schein, 2004). Also, empirical results suggests the existence of a positive association between team effectiveness and the organizational culture (Denison & Mishra, 1995; Denison, Nieminen, & Kotrba, 2014; Littrell et al., 2018; Tsai, 2011). Since culture involves shared learned beliefs that can influence the emotions and behaviours of employees (Schein, 2004), there are suggestions from empirical studies that employees derive social identity and belongingness in the workplace, as a way of increasing their motivation and job satisfaction (Tsai, 2011).

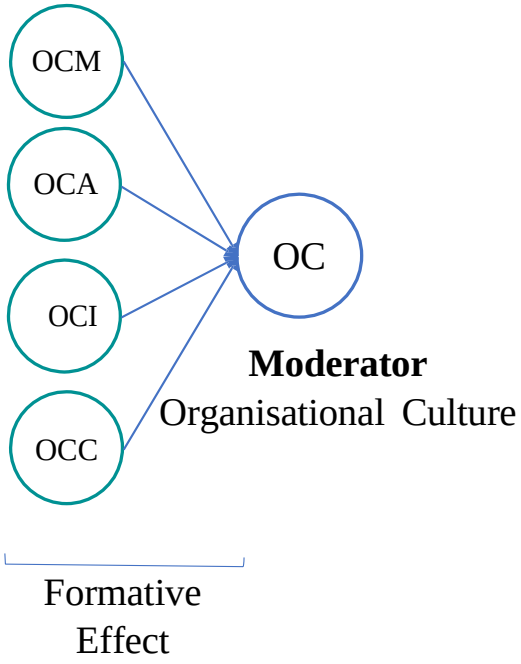
Dimensions and Measured Variables

The acronym "OC" for organizational culture have been adopted in the construct, and the measured variables have the first letter from the four quadrants of the Denison model – Mission, Adaptability, Involvement and Consistency, added to "OC." The four measured variables – OCM, OCA, OCI and OCC, have been operationalised as defined in chapter 3. The variables formative components of organizational culture since this investigation treats

organizational culture as a holistic concept comprising of multiple values and assumptions present in project teams. As a moderator of the cross-cultural dimensions, it is expected that OC will positively influence the LA and PTE.

Figure 2.12.

Study construct for organizational culture



Project Team Effectiveness

The need to empower employees and encourage them to attain their full potential has been the rationale behind the increasing belief in team-based working. Theoretical models have been developed, as discussed later, to explain the basis of team integration and performance. Teams are unique to the need of the organization, hence the duration of the team, roles interchangeability and the task to be achieved are variables that determines the nature of the team (Torrington, Hall, & Taylor, 2005). The team's effectiveness relies on goals, organizational culture, and work nature. Enhancing team effectiveness can impact team design, members' competence, and leadership style accordingly (Hackman, 2002; Kozlowski & Ilgen, 2006; Tuckman, 1965). Team size is an important factor in ensuring team effectiveness (Jr et al., 2013). It has been suggested in the literature that the smaller the team the more effectiveness is the team (Torrington et al., 2005).

However, project teams in the oil and gas industry can be as large as 600 members and made up of smaller teams within the larger team. Therefore, it is important to investigate how the CCD in a large team influences the effectiveness of the team, and how the leadership mediates this effect in the presence of a moderating effect of organizational culture on cross-culture. In this section, detail discussion will be provided on the factors influencing team effectiveness, theoretical team effectiveness simulations and the operationalization of the measured dimensions/variables.

Factors Influencing Project Team Effectiveness

Team effectiveness is dependent on several factors, including the pattern of communication which can influence honesty, courage, and prudence, which are moral values expected to be displayed by members of the team (Kloppenborg & Petrick, 1999). As mentioned and discussed earlier, the domain of leadership encompasses the leader - followers connexion (Graen & Uhl-Bien, 1995), project changes and team expectations throughout the team development stages

(Kloppenborg, 2015). Therefore, it is important that the leadership enhances the needs of the team for effective team performance. Based on the adopted a working definition of project leadership, the *relationship* between the leader and the team is structured to create the atmosphere for teamwork. Implying further that teamwork competencies are highly needed by leaders and followers to enhance the benefits from the diversity in a project team (Fonceca et al., 2017). Studies indicates that the benefits of teamwork include continuous innovation and high productivity (Duhigg, 2016; Edmondson & Nembhard, 2009; Glassop, 2002).

Therefore, it is important that leaders understand the specific nature and characteristics of the workforce in relation to the task(s) to be completed. Consequently, teamwork competencies expected from leadership in an organization encompass a range of essential skills and qualities that contribute to effective collaboration, cohesion, and achievement of common goals. Three key competencies in this regard are the ability to motivate the team, resolution of conflicts, and demonstration of leadership presence during change. Leadership requires the ability to motivate teams, create a positive work environment, and inspire individuals to give their best. Clear expectations, recognition of achievements, and support are crucial.

Conflict resolution skills are necessary for maintaining teamwork. Leaders should listen actively, promote open communication, and find solutions that benefit everyone. During times of change, leaders need to provide guidance and communicate openly. They should clarify the vision, address concerns, and demonstrate confidence, adaptability, and resilience to inspire trust and help the team navigate change successfully. In Table 2.11 below, a distinction is made between working group, team characteristics and thier relatedness to the expected values in project teams.

Table 2.11

Characteristics of an effective project team

Difference Between Working Group and Team (Katzenbach & Smith, 1993)		**Project Teams**
Working Group	**Team**	
Efective and focused leadership	Shared-leadership positions	Strong, clearly focused leader, with shared leadership roles in the form of delegation when required (Atesmen, 2015; Cobb, 2012; Kloppenborg, 2015)
Individualised accountability	Individualised and mutual accountability	Individual accountability where team members have clearly defined roles and responsibilities; and mutual accountability when there are shared roles and responsibilities (Cobb, 2012; Kloppenborg, 2015)
The group's commitment is driven by the organizational mission	Exclusive team commitment that is deoendent in the team's goal.	The project goal(s) aligns with the broader organization culture, except there is need for change which is already agreed by the organizational leadership (Kloppenborg, 2015)
Individualised productive outcomes	Collective productive outcomes	Individual works aggregates towards the collective project goal (Kloppenborg, 2015)
Conducts productive meetings.	Promotes discussions without predetermined conclusions and encourages proactive problem-solving in meetings.	The meetings are efficient because they are timely and based on enhancing productivity where open-discussion favours the culture of learning (Kloppenborg, 2015)

Individualised self-check productivity-based assessment	Collective productivity-based assessment	Effectiveness is measured by the key performance indicators because of the high need for achievement (Kloppenborg, 2015)
Deliberates, chooses best approach, and assigns roles to individuals	Deliberates, chooses best approach, and assigns roles to the team as a collective efort	Deliberates, chooses best approach, and assigns roles to the team as a collective efort (Atesmen, 2015; Kloppenborg, 2015)

The indication from the above suggests that the project team combines the characteristics of the working group and team espoused in the literature cited. Project success is highly dependent on the nature of communication pattern in teams. This includes leadership versus team and team member versus other members of the team. The effectiveness of these communication patterns has strong effect on the effectiveness of the team in achieving the project goal (McComb & Kennedy, 2020). It has been argued in the literature that there over a 100 definitions of the communication (Wrench, 2013).

Models that explain communication within the organization are centred on selecting mediums of interaction with high information and social richness (Robert & Dennis, 2005). Hence, team effectiveness can be enhanced by the leader through the adoption of explicit communication mediums that enhances leader-follower interaction. This can encourage team members to accept the needed change for improved project team performance (Jetu & Riedl, 2013). Explicit communication maintains team coordination towards the achievement of project goals (Kozlowski & Ilgen, 2006). The remainder part of this section is structured to include discussion on project

team dynamics as seen in organizations; leadership styles versus project team dynamics; and aligning leadership styles to the dynamics of the team.

Project Team Dynamics

According to (Forsyth, 2010, p. 2), group dynamics is "the actions, processes, and changes that occur within groups and between groups." Team dynamics occur when the above interaction within the team and between teams is directed towards results (Katzenbach & Smith, 1993; Kloppenborg, 2015). Leadership is a process of change within an organization (Northouse, 2019), and responsible for creating the dynamics in the group (Forsyth, 2007). Thus, groups creates social climates in the workplace where the dynamic interactions in the group determines the level of cohesiveness among the members of the group (Lewin et al., 1939). The dynamic characteristics of a group include "interpersonal relationships, intellectual, physical, and socioeconomic status, and personality characteristics" (White & Lippitt, 1968, p. 318).

Again, the dynamics in the work group can also be explained from the *theory of followers* developed by Kelley (1988, 1992). In this theory, the author suggested five followership styles: (1) the *conformist* are the *yes group* and do not question the decision of the leader but highly active and energized by the decision of the leader; (2) the *passive* group follow the lead of others and work with great enthusiasm and commitment; (3) the *pragmatic* group contribute what they can to the work process without been active, passive, conforming or independent; (4) the *alienated* group maintains partial independence and contribution to the goals of the group; and (5) the *exemplary* group while interested in the group's interest can sometimes disagree with the decision of the leader and openly expresses their disagreement.

Thus, the classification of followership styles by Kelley can be understood from the influencing characteristics of a group presented earlier by White and Lippitt (1968). How these are

harnessed by the project leadership in problem-solving, innovative decision-making and the overall health of the team is critical to project success. What the above discussion clearly indicates is the fact that multiple leadership styles must co-exist in an organization and that group dynamics can vary from one group to another within the same organization. This observation is also corroborated in another study by Gadirajurrett, Srinivasan, Stevens, and Jeena (2018), where the authors suggest that one leadership behaviour is not the most adequate and efficient for the given situation. Hence, leadership has also been conceptualised as a situation-dependent process of change (Northouse, 2016; Vroom & Jaago, 2007; Yukl, 2008), which is expected in larger projects as seen in the industry of study.

Influence of Leadership Style on the Dynamics in the Project Team

The concept of leadership comprises the leader-followers relationship and the authenticity of the relationship (Graen & Uhl-Bien, 1995; Wolman, 1956). This interaction perspective guarantees that leadership is understood as a give-and-take process and dependent on the group/team situation (Forsyth, 2010). In advancing the leader-follower relationship, McGregor formulated two theoretical leadership styles that can be adopted in a group, which can be separated as –"leading followers with motivational incentives and control" and "leading followers with supportive guidance" (Forsyth, 2010).

McGregor explained the first set of followers with "Theory X" and the second group with "Theory Y." Consequently, leaders who adopts Theory X assumes that members of the group are lazy and needed to be ordered about, while leaders adopting Theory Y assumes that group members are competent, demonstrates self-efficacy and the determination to achieve set targets (McGregor, 1960). However, this kind of assumption can lead to oversight on the group under Theory Y leadership and such over-confidence on the competence of the group from the leadership can make

it difficult for members of the group to increase learning. This assumption is prevalent in projects and is the reason some project leaders prefer to recruit and engage highly competent team members. Team members usually worry over their next role when the project is completed (Kloppenborg, 2015), and the project leadership must deal with this concern to avert project delays.

In a series of experiments conducted to observe the effect of leadership on group dynamics, three leadership styles – *autocratic leadership,* where the leader made the decisions for the group; *democratic leadership,* where the leaders allowed group members to contribute to the process of decision making; and *laissez-faire leadership,* where the members in the group were given little guidance, the authors reported that productivity was higher in the work group under autocratic leadership, followed by democratic leadership and finally laissez-faire leadership (Lewin et al., 1939; White, 1990; White & Lippitt, 1968). Another study suggests that a leadership style that enhances the social climate also encourages more effective group participation (Fox et al., 2000).

These findings explains that the leadership style in an organization can influence the group dynamics. Again, empirical results suggests that psychological safety, where members of a group are free to speak out without fear of victimization by the leadership, is positively correlated to the performance of a group (Edmondson & Lei, 2014; Frazier et al., 2017). Hence, it is important that the project leadership adopts a style that promotes psychological safety within the team. Wolman (1956) identified four effects of leadership style on a group's dynamics as follows: weak leadership, excessive deference to authority, blocking and evaluation of apprehension.

How the leadership can minimise the excesses from the dynamics in the group will be discussed later under aligning leadership styles to the dynamics of a group. In addition, Forsyth (2010) suggests that the dynamics of a group can be aligned under two broad leadership perspectives – task leadership and relationship leadership. Both leadership characteristics are well

suited for project activities. Hence, in discussing the leadership in a project team, it is equally important to define the task characteristics and the expected kind of relationship based on the adopted leadership style.

Accordingly, experimental findings indicate that the leadership in a group is influenced by the authority of the leader and the ability to meet the needs of the team, and his or her acceptance by the group, as this will determine the style of leadership that can enhance productivity (Wolman, 1956). Even when the organization dictates the expected leadership behaviour, a dysfunctional leadership behaviour can hinder the performance of a team (Lencioni, 2002). The implication of the findings in Wolman's study is that the dynamics in a group favours task-oriented leadership style. However, since a project team is a blend of working group and team (Table 2.11), both task-oriented and relationship-oriented leadership styles must exist simultaneously to improve team effectiveness.

Models of Team Effectiveness

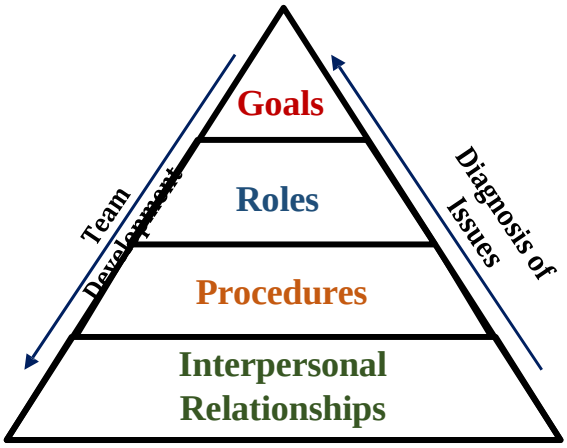
Whereas teams are important in projects, not all teams are effective. Hence, the development of theoretical models with the aim to enhance the effectiveness of teams exist in literature. There are, basically, six team effectiveness models comprising of: (1) the GRPI (Goals, Roles, Procedures and Interpersonal relationships) model was developed by Rubin, Plovnick and Fry (1977); (2) Katzenbach and Smith (1993) wisdom of teams' model; (3) the T7 model of team effectiveness by Lombardo and Eichinger (1995); (4) the five dynamics of team work and collaboration model by LaFasto and Larson (2001); (5) the five conditions necessitating great team performance model (Hackman, 2002); and (6) the five dysfunction of a team model (Lencioni, 2002). The main characteristics of these models will be discussed in the subsections below.

The GRPI Model

This model is represented as a pyramid as defined below. The goals to be achieved are critical to the effectiveness of the team because they determine the nature of the team, the roles, the interpersonal relationship needed for team cohesiveness and team procedures.

Figure 2.13

The GRPI model by Rubin et al. (1977)



Each of the determinants in the pyramid are explained in Rubin, Plovnick, and Fry (1977) as follows: (a) the "goals" to be achieved must have clearly defined objectives, expected output and the team priorities: (b) the roles of every team member must be clearly defined and the recognition of a team leader among them; (c) the decision-making procedure defines the process adopted in problem solving; and (d) interpersonal relationships is critical and must be achieved through effective communication, trust and roles flexibility. The team's development improves down the pyramid, while problem-solving is enhanced up the pyramid. This requires effective communication among team members. While recognizing the significance of team bnding, the current team effectiveness framework lacks precision concerning the influence of team leadership

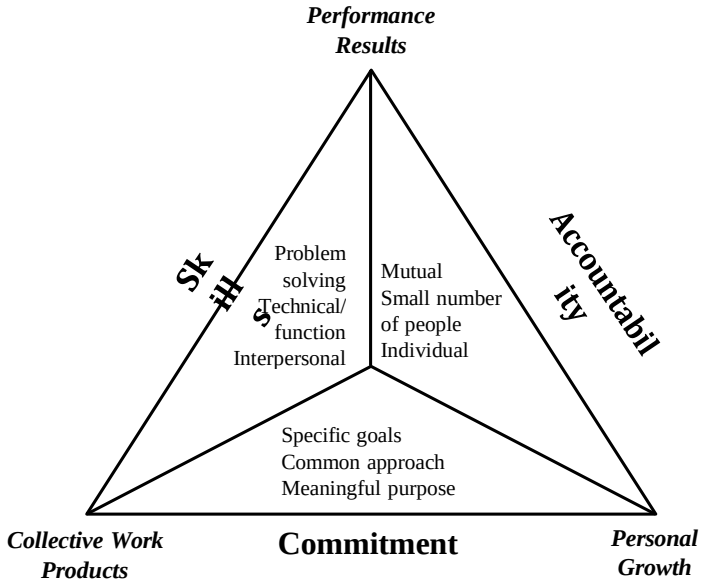
on both team progression and handling performance concerns. Furthermore, the influence of OC on the process of team development remains unspecified within the model.

The Wisdom of Teams Model

This team effectiveness model was developed by Katzenbach and Smith was based on the understanding that "teams are the single, most powerful unit for delivering both performance and change" (Katzenbach & Smith, 2001, p. 209) needed to achieve highly demanding and challenging tasks. Consequently, the model clearly defined the expected outputs of the team on the vertices of the triangle – collective work products, performance results, and personal growth. The sides and centre describe the elements of team effectiveness responsible for the outputs achieved by the team.

Figure 2.14

Wisdom of teams model by Katzenbach and Smith (1993)



The main elements of team performance are outlined by the sides of the triangle as commitment, accountability, and skills, as explained further. Through *commitment*, teams are

motivated by a specific goals, meaningful purpose, and develop common approach to achieving the goals by breaking the barriers the undermine their collaborative efforts; *skills* are needed in problem-solving, in accomplishing technical aspects of the tasks, as well as interpersonal communication for enhanced teamwork; and finally, the drive for both personal and mutual *accountability* is defined by the high-performance demand placed on teams by the leadership. The authors contend that teams establish goals and work methods. However, this perspective contrasts with specific scenerio where leadership sets organizational goals and determines the organizational culture, along with professional standards and ethics, defines work methods. Skills, though complementary, are typically honed before the project, forming the basis for team recruitment.

The T7 Model

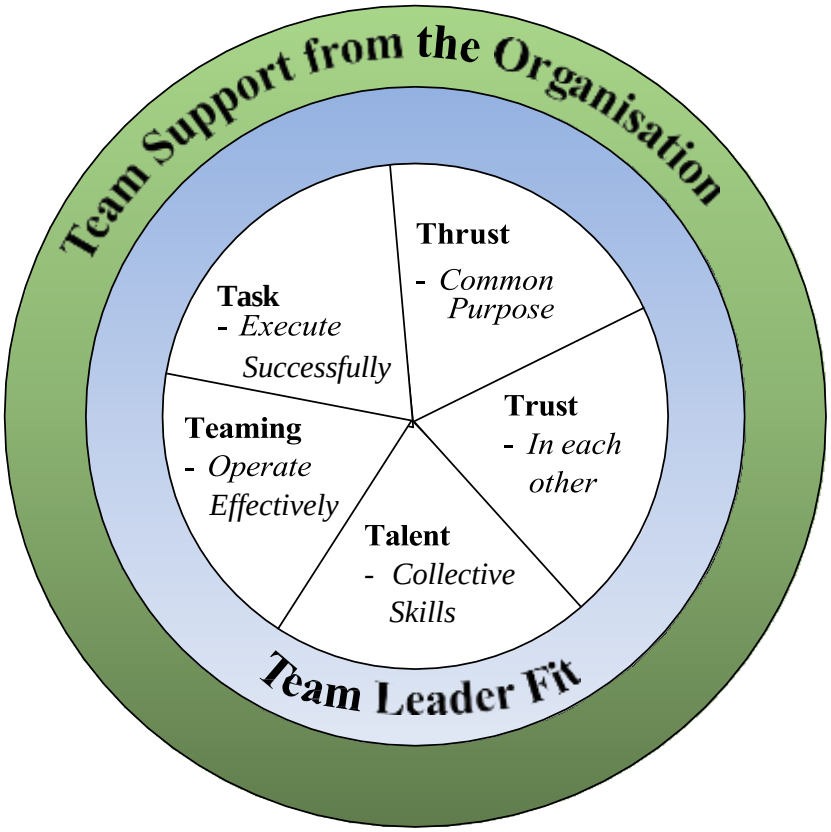
In 1995, the "T7 Model," also known as the Korn Ferry T7 model, was originally developed by Michael Lombardo and Robert Eichinger to define the key factors affecting team effectiveness (Institute, 2016). These factors are comprised of five internal and two external factors, all starting with the letter "T," hence the name, T7 model. The five internal team effectiveness enhancing factors presented by the authors include: (1) Thrust - representing the common goal to be achieved by the team; (2) Trust – expressing the confidence that each team member have on other team members to perform their own task and render assistance when needed; (3) Talent – represents the collective skills that are employed by each member to get the job done; (4) Teaming skills – needed for the functionality of an effective and efficient team instead of acting as group; and (5) Task skills – needed to get the job done.

Also, the two external team factors that enhances team performance are defined in the literature as: (a) Team-leader fit – an assessment of how the leadership meets the needs of the

team; and (b) Team support from the organization – suggesting that the effectiveness of teams is dependent on the support received from the organizational leadership. Thus, all five internal factors must be present for a team to achieve high performance. To meet the needs of the team indicates that the leadership must play a mediating role between the characteristics of the team and the team's effectiveness. Again, the dependence of team effectiveness on the support received from the organizational leadership is defined within the framework of the organizational culture.

Figure 2.15

T7 team effectiveness model by Lombardo and Eichinger (1995)



The T7 model does not specifically address how CCD influence internal factors. In a typical project situation, the two external factors will not be absolutely external since the leadership significantly defines goals, policies, standards, and procedures. Organizational support moderates the impact of

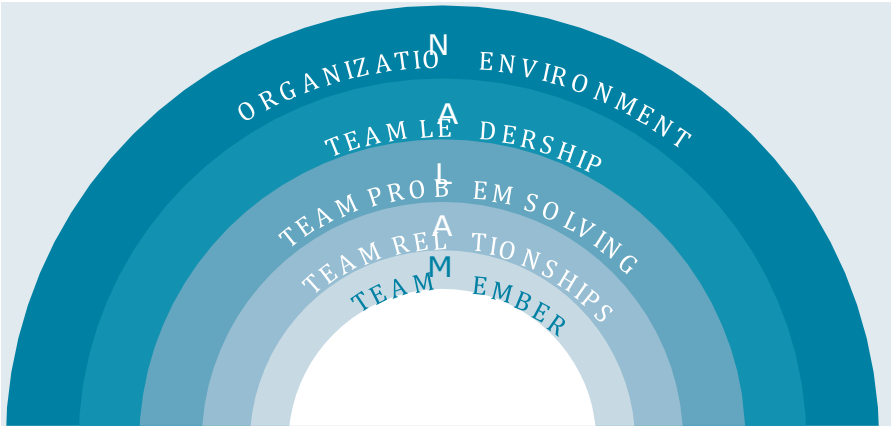
organizational culture on cross-cultural dimensions within the team. I have highlighted the team's cross-cultural characteristics earlier, emphasizing the role of leadership in defining goals and operational methods. This research addresses these gaps by investigating how cross-cultural dynamics direct the team toward project goals, aligning with organizational objectives. Hence, the team operates to achieve the organization's goals, as outlined by the owner and client.

The LaFasto and Larson Model

This model was developed from the insights gathered from studying 600 teams across different industries by Frank LaFasto and Carl Larson in 2001, and the outcome of the study led to what they termed “Five Dynamics of Teamwork and Collaboration” (LaFasto & Larson, 2001).

Figure 2.16

The LaFasto and Larson model (Korn Ferry Institute, 2016, p. 9)



The possibility of team effectiveness was centred on: (1) Team membership – defined by having the required skills for the job and the demonstration of team-centric behaviours; (2) Team relationship –for healthy interactions that can enhance task and social cohesion; (3) Team problem solving – in agreement with the purpose of the team to deliver agreed goals; (4) Team leadership – to steer the team to success; and (5) Organizational commitment – promoting teams’ commitment through the right organizational culture and policies. The focus of this model is on

team membership, which is at the core of the model. Each member of the team displays openness, supportiveness, activeness, and a positive personality behaviour (Institute, 2016).

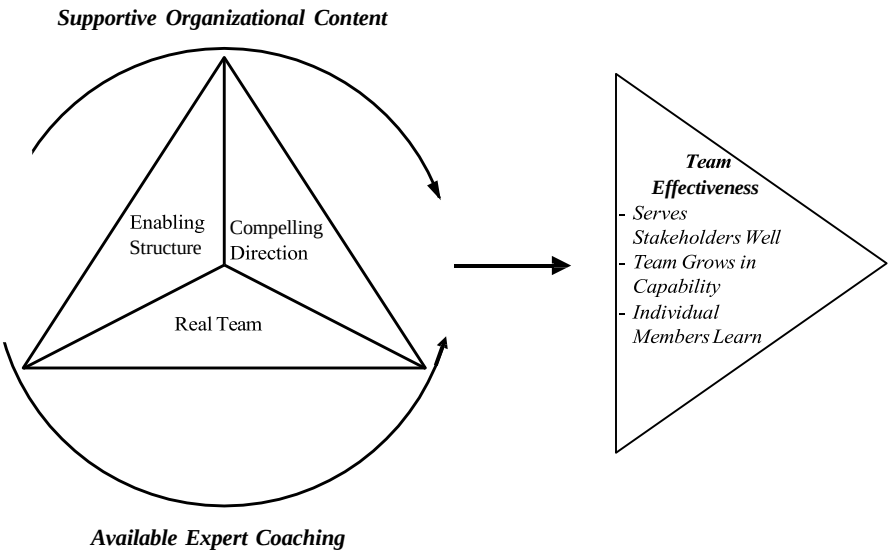
However, a notable gap was the absence of discussion on how cross-cultural factors influence team members' behaviour and the compromises individuals make to align with the interests of the team. In realizing project success, the team needs to have both a team-oriented approach and essential project skills. Competence in basic technical skills ensures proficiency, while behaviours like effective communication and collaboration enhance team cohesion, productivity, and overall positive outcomes.

Hackman Team Effectiveness Model

The five team effectiveness enabling conditions presented in the literature (Hackman, 2002), include: (1) the presence of a real team for the purpose of problem-solving, (2) the presence of a compelling direction for goals achievement to differentiate the team from being a group, (3) the presence of enabling structure, such as team leadership and organizational culture that creates the enabling workplace for teamwork, (4) the organization must be supportive, and (5) the presence of expert coaching to enhance the achievement of goals and teamwork. According to the model, a genuine team and the eanabling structure that supports the team can be empowered by cross-cultural elements within the team or organizational cultural dimensions, both reliant on culture. A clear direction arises when leadership implements project-oriented polici and standards. Thus, cross-culture, organizational culture, and leadership behaviour directly impact the the three productivity-driven effectiveness of the team stated in Hackman's model as group experience, socializing processes, and productive output.

Figure 2.17

Hackman team effectiveness model by Hackman (2002)



The Lencioni Model

Based on his experience working with CEOs, Patrick Lencioni authored a book in 2005 where he presented "the Five dysfunctions of a team" as a model of team effectiveness (Lencioni, 2002). In this model, the author addresses five reasons why teams are ineffective in a hierarchical order from the base of the triangle as presented to include: (1) the *absence of trust,* when team members are unable to discuss their mistakes and weaknesses with other team members because to avoid being vulnerable; (2) in the absence of trust among team members, they are unable to challenge the status quo because of *fear of conflict*, leading to poor decision making process and lack of ownership of the work to be achieved; (3) the continual non-participation of team members in decision making can lead to *lack of commitment* to the goals to be achieved by the team ; (4) when the members are not committed to the work process, there will also be *avoidance of accountability*, because there is no demonstration of ownership among them; and (5) the absence

of accountability will lead to *inattention to results*, and the team will become infective and unproductive. The model discussed above is represented in the pyramid below.

Figure 2.18

The Lencioni model (Lencioni, 2002)

The issues presented in the model are met to be tackled from bottom up, to enhance the effectiveness of the team. The model clearly recognises the role of leadership in teamwork. However, there was no discussion of how the organizational culture and cross culture influences these dysfunctions within the team.

Which is the Right Model?

High-performance teams are a unique blend of individual perspectives, group dynamics, and organizational support. The gap in the above models include not able to define the direct link between: (1) the OC and PTE; and (2) LA and PTE. A triangle with OC, LA and PTE as vertices can provide a clearer effect of what determines team effectiveness. This will be undertaken in this invetsigation. The team diagnostics survey presents the key determinants of team effectiveness as socializing process, productive output, and group experience (Hackman, 2002).

Table 2.12

Identified gaps in the literature

Team Effectiveness Model	Main Characteristics	Identified Gaps
GRPI Model	Team roles are defined by the collective goals, which can be redefined by the team to enhance effectiveness.	In project teams within the oil and gas industry, there is little support for this viewpoint as objectives are pre-established and positions are assigned accordingly. Although the team effectiveness model recognizes the significance of team bonding, it fails to clearly define the involvement of organizational leadership in team growth and the resolution of performance concerns. Furthermore, the model does not elaborate on how organizational culture shapes the overall team advancement process, leaving significant aspects of this impact unaddressed.
The Wisdom of Teams Model	Adopted a diagnostic approach that determines the effectiveness of the team in achieving high demanding tasks.	This diagnostic model underscores the importance of exploring how cross-cultural dimensions affect team effectiveness. Such insights can inform the establishment of appropriate behavioural norms, mitigating the adverse effects of cross-cultural conflicts with organizational culture.
T7 Model	A common strategy and tactics are employed to accomplish the goals through separate internal and external factors.	The model did not explore how cross-cultural aspects impact the five internal factors. In project situations, what are commonly referred to as external factors are not entirely external, as leadership plays a

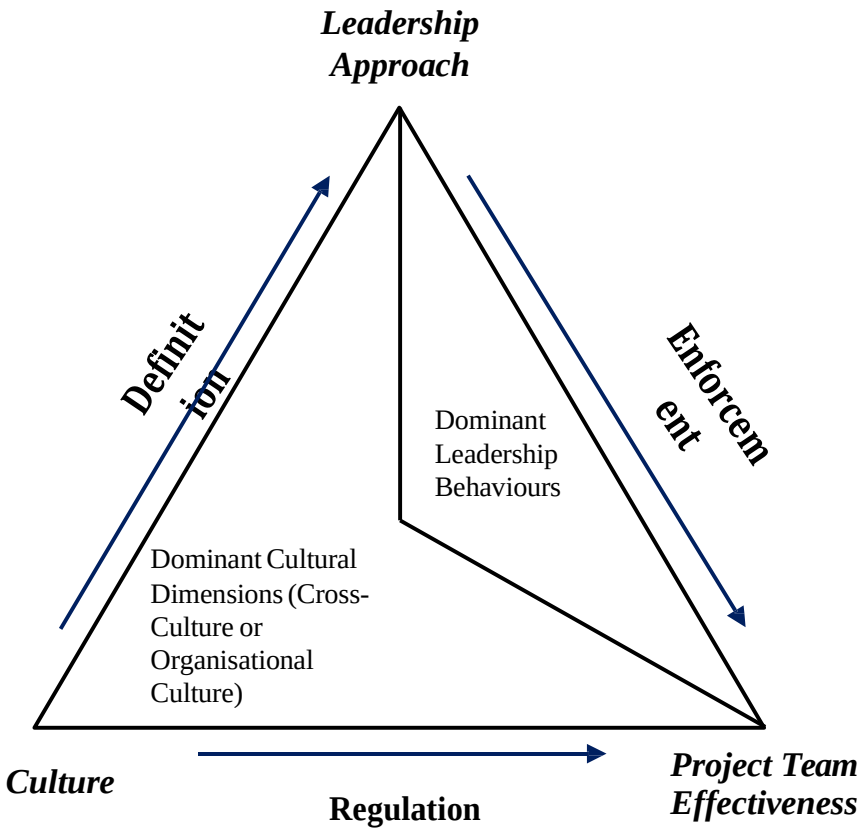
		significant role in defining goals, policies, and procedures crucial for the team's task accomplishment.
LaFasto and Larson Model	Concentrated on team participation, ensuring members exhibit openness, supportiveness, proactivity, and positive behavioural traits.	The model overlooked how cross-cultural factors affect team members' behaviour and the compromises individuals make to align with the team's interests, trading personal preferences for the team's benefit.
Hackman Model	Team effectiveness is measured by the team's group experience, socializing processing,and productive output.	As a gao, it is essential to clarify how cross-cultural aspects impact genuine team dynamics, along with understanding how organizational culture and leadership shape the supportive framework.
Lencioni	Unproductive teams are the result of lack of trust, commitment, accountability and results, and unproductive conflicts.	The model acknowledges role of leadership in enhancing teamwork, but lacks exploration of how organizational and cross-cultural factors affect dysfunctions within the team..

This research adopts the Hackman's three measurable criteria for team effectiveness – group experience, socializing process, and productive output, and as defined earlier. Accordingly, a working definition of team effectiveness is adopted in this study as a condition where the team's output consistently meets specified quality, where the fundamental aim of socializing among team members is to enhance their capability to work together interdependently and contribute positively to the well-being and learning of team members. Thus, this study is conceptualised in a project environment where leadership behaviour enforces team effectiveness, and the cultural dimensions regulates team effectiveness and define the leadership style. Therefore, the position investigated is

represented in the triangle below, and the correlational effect of each of the concepts at the vertices on the path defined by the direction of the arrows will be investigated.

Figure 2.19

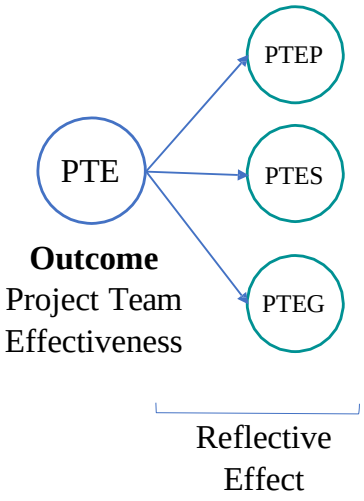
Proposed team effectiveness model to be investigated in this study



The team effectiveness questions were derived from the literature on team diagnostics survey (Wageman et al., 2005), comprising of three key aspects of team effectiveness – productive output (PTEP), socializing process (PTES) and group experience (PTEG). A reflective measurement approach was adopted for this construct to express the three criteria as the outcome of an effective project team. Hence each of the criteria is distinct as output predictions in this study and helps the research to achieve the purpose of predicting project success and the relative direction of the success.

Figure 2.20

Reflective effect modelling of project team effectiveness construct



Summary on Literature Review

In this chapter, related literature pertaining to the four concepts of this study – leadership, organizational culture, cross-culture, and project team effectiveness was reviewed. Prior to the review, the theoretical framework was evaluated. The performance and sustainability of every organization rest on the leadership, hence the first part of this literature review considered the concept of organizational leadership as a psychological construct. Organizational leadership is concerned with how leaders influence their followers to accept the process of change for achieving the common goal (Northouse, 2016; Ivancevich, Matteson, & Konopaske, 2013; Stogdill, 1974).

From this perspective, leadership can be said to be the actualization of organizational goals through the process of change by enhancing the productive interactions between the leader and followers. Thus, the domain of leadership encompasses the leader-followers relationship. In effect, the *relationship* creates the atmosphere for teamwork. Implying that teamwork competencies are highly needed by leaders and followers to enhance the benefits from the diversity in a project team.

Studies indicates that the benefits of teamwork include improved innovation and high productivity (Duhigg, 2016; Edmondson & Nembhard, 2009; Glassop, 2002). The review revealed the need for organizational leaders to understand the specific nature and characteristics of the workforce in relation to the task(s) to be completed. This led to the consideration of project leadership as a unique construct different from contemporary leadership behaviours in the second part of the review.

In the second part of this literature review, project leadership was considered because it is a topic with growing research interest (Krahn & Hartment, 2006). Project leadership was explaned as the blend of artistic expression and scientific methodology in steering a project team towards the successful delivery of a project, by dealing with volatile business environment and change (Krahn & Hartment, 2006). Project leadership ensures that the team accomplishes more than they could as individuals by bringing people together to achieve a common goal. Effective leaders are those who apply the appropriate skills at the appropriate time for the appropriate situation (Kumar, 2009). The ideal leadership mediation can resolve the dysfunction within every team identified in the literature (Lencioni, 2002) by enhancing trust, commitment, productive and innovative conflict, accountability and results. Though studies on the influence of leadership behaviour on project performance exist in the literature, there is currently no agreed leadership style among researchers that is specific to project performance.

However, there are positive correlations between project performance and transactional, transformational, and authentic leadership approaches in literature. Still, the current complexity of projects and the uncertainties in the environments where projects in the studied industry are executed requires varied leadership approaches to mediate team-performance related problems. This calls for a contingency approach where the adopted leadership behaviour is dependent on the

characteristics of the task, project environment, and the followers. This necessitated the adoption of path-goal leadership approach in this research. Project characteristics are related to the characteristics of the environment and team (Krahn & Hartment, 2006). The need to continually motivate project team to achieve the project quality is important to the success of every large-scale project. The purpose of the path-goal leadership theory according to (Northouse 2016, p. 115), "… is to enhance follower performance and follower satisfaction by focusing on follower motivation." The path-goal leadership theory has several strengths based on its application, especially for developing a framework for comparing a leader's performance under different task and follower's characteristics (Northouse, 2019). Hence, this study investigates how the four main dimensions of this leadership approach: directive, achievement-oriented, participative, and supportive styles, can enhance team effectiveness.

The third part of this literature review deliberated on cross-cultural psychology because of the understanding posited in the extant literature of the effect of cross-culture on the functioning of work teams. Various definitions of culture exist, starting from the early 1950s to date, but this research adopts the definition that, "culture is the collective programming of the mind that distinguishes the members of one group or category of people from others" (Hofstede, 2011, p. 3). Sources of cultural differences have been identified to include parenting strategies in different societies, cultural institutions such as schools and religion, inherited genetic programming and other environmental factors (Hofstede et al., 1990; Lonner, 2011).

Although cross-cultural studies linking the environment to the behaviour of the individual are not conclusive, there are indications of positive relationship between both concepts (Lonner, 2011). Since, *norms* are used to regulate the behaviour of the team (Lonner, 2011), it is important to understand how project leadership can instil a common acceptable set of norms within the team

to enhance team effectiveness. These norms are related to workplace environmental factors in this study, which include the organizational culture, leadership approach and technical nature of the projects in the oil and gas industry. Hence, the focus of this study is to investigate the dimensions of cross-culture in the literature that identifies the norms that are present in project teams, and how these norms can be influenced through their association with other measured variables in the study construct. Consequently, four cross-cultural dimensions in the literature were selected based on the specific need for this investigation These dimensions include individualism versus collectivism, power-distance, uncertainty avoidance and long-term versus short-term orientation (Hofstede, 2011).

Equally important, was the need to consider organizational culture as a unique predictive construct that influences project success. Hence, in the fourth part of this review, organizational culture was discussed. Earlier, culture was defined as "the learned beliefs, values, rules, norms, symbols, and traditions that are common to a group of people" (Northouse, 2019, p. 434). Previous studies in organizational culture have investigated its relationship with other variables that influences performance, leadership behaviour, motivation, and employee job satisfaction. Organizational performance deals with effectiveness and efficiency (Daft, 2012; Jones & George, 2016); relating to how the organization achieves the goals of the organization through the efficient utilization of resources.

This is where organizational culture is related to team effectiveness. Hence, all elements of a project – from processes to leadership, management styles, communication, risk tolerance, and project request management – are influenced by cultural norms in the company. The variance in the organizational work culture and that of individual members of the team can lead to friction. Thus, organizational culture can directly influence team effectiveness (Jetu & Riedl, 2013).

Finally, two main models of organizational culture – CVF (Cameron & Quinn, 2011) and Denison (Denison, Janovics, & Young, 2006) models was considered, with this study adopting the dimensions of the Denison model (mission, adaptability, involvement and consistency), because of their relatedness to the direction of this study.

The fifth and last part of this review considered project team effectiveness. Teams are unique to the need of the organization. The need to empower employees and encourage them to attain their full potential has being the rationale behind the increasing belief in team-based working. A working definition of project leadership is adopted, as the "knowledge, skills, and behaviours needed to guide, motivate, and direct a team, to help an organization achieve its business goals" (PMI 2017, p. 56). In effect, the *relationship* between the leader and the team is structured to create the atmosphere for teamwork. This literature review has revealed that project execution is positively related to a strong people-oriented leadership skills (Krahn & Hartment, 2006), which is defined by the existing organizational culture. Also, studies suggest that leadership behaviour in an organization can influence team members' effectiveness (Rego et al., 2016), with significant and positive association with organizational culture (Littrell et al., 2018; Tsai, 2011).

Empirical observation in Fleishman (1973), suggests that pressure for output can increase grievance among the work force. Hence, project team performance can be moderated by the right organizational culture. Also, empirical results suggests the existence of a positive association between team effectiveness and the organizational culture (Denison & Mishra, 1995; Denison, Nieminen, & Kotrba, 2014; Littrell et al., 2018; Tsai, 2011). Since culture involves shared learned beliefs that can influence the emotions and behaviours of employees (Schein, 2004), there are suggestions from empirical studies that employees derive social identity and belongingness in the workplace, as a way of increasing their motivation and job satisfaction (Tsai, 2011). After

considering several models of team effectiveness during the review, the team effectiveness questions was derived from the literature on team diagnostics survey (Wageman et al., 2005), comprising of three key aspects of team effectiveness – socializing process, productive output, and group experience.

Thus far, the existing literature on project delivery has not undertaken a comprehensive investigation into the interaction between project team effectiveness, cross-culture, organizational culture, and leadership, as a distinct study construct. Therefore, this doctoral research will help to fill this gap. Chapter 3 discusses the methodology that will answers the research questions to fulfil the objectives discussed in chapter 1.

CHAPTER 3: RESEARCH METHOD

The purpose of this study is to address the research gap identified in the literature earlier to improve on existing team effectiveness models by incorporating cross-culture (variable 1 – predictor), team effectiveness (variable 2 – outcome), Path-Goal leadership (variable 3 - mediator) and organizational culture (variable 4 - moderator) in single research construct. As a result, it explores: (1) The direct link between the measured dimensions of cross-cultural and project team effectiveness through structural equation modelling (SEM); (2) How project leadership mediates the relationship in objective (1); (3) The moderation by the dominant organizational culture on the leadership mediation effect of the first causal relationship above, and (4) How organizational culture moderates the relationship in objective (1), above.

To achieve the aim and objectives of this investigation, a quantitative research method was adopted. The study was conducted cross-sectionally with a closed-ended Linkert scale questionnaire survey data collection tool to participants through a blind selection process where the researcher did not influence because of the specific inclusion and exclusion criteria. The questionnaire is ordered and centred on the ontological dimensions of the four concepts in the research construct. Essentially, this work ranked leadership behaviours according to their significance in enhancing team effectiveness and overcoming project delays and failures from a cross-cultural perspective.

A multi-stage investigative approach was adopted during the data analysis to reveal the correlational relationship among the dimensions of organizational culture, cross-culture, leadership, and project team effectiveness, and the causal relationship between these four concepts. Adopting this approach to data analysis, provided a systematic examination of the collected field data to uncover the complex relationship between the dimensions of organizational culture, cross-

cultural, leadership, and project team effectiveness. This approach provides a more robust understanding of how these factors interact and influence one another, shedding light on the underlying mechanisms at play. Regression analysis and correlation coefficients are adopted to examine the relationships between variables. The causal analysis employed structural equation modeling and path analysis to evaluate the cause-and-effect relationships among the identified concepts. The overarching goal of this doctoral research was the development a leadership model that studies the complex relationship among the concepts in a project environment to enhance the performance of projects in the industry, and to provide insight into the relative relevance of the dimensions adopted for this study on project success.

Chapter 2 reviewed the extant literature on the above four concepts and their relatedness to the needs of this research. Specifically, the chapter: (a) discussed the adopted conceptual and theoretical framework in detail, (b) provided a historical overview of the psychology of leadership and theories, (c) reviewed the literature on project leadership and the rationale for adopting the path-goal leadership approach, (d) reviewed the literature on cross-culture, (e) reviews the literature on organizational culture, (f) reviewed the literature on team effectiveness, and (g) provided the gap in the literature necessitating this PhD work.

This chapter developed a detailed research design and methodology that will enable the testing of the stated hypotheses in chapters 1 and 2. The main areas covered include the adopted philosophical assumptions, the population and sample size design, data collection instrument and the adopted multi-approach statistical techniques to data analysis.

Research Approach and Design

In research, several questions are answered relating to the problem of concern, the available knowledge and the gap that exists, and how to seek the knowledge that leads to a better

understanding of the problem. The above concerns are attended to from the adopted philosophical paradigm by researcher(s). Most times, it is important that the research philosophy adopted is reliable and consistent with the field of study. Once the researcher(s) states the philosophical assumptions and the design adopted, the expected outcome usually aligns with those assumptions. Here is where subjectivity is first introduced into the findings of the research. However, subjectivity in research can minimized in several ways. The first is the adoption of a suitable research approach (Saunders et al., 2019). Research approaches/designs can either be quantitative and qualitative, or a mix of both.

The use of either design or a mix of them is premised on the need to investigate the phenomenon of study from different perspectives (Creswell, 2009; Saunders et al., 2019). Whereas quantitative method is generally favoured by positivists to provide answers to "what" the measurable real or latent variables are in a causal relationship in a research construct, qualitative method is interpretivist in nature and is adopted when the need is to provide in-depth understanding on the "what, why and how" to describe the phenomenon (Easterby-Smith et al., 2015; Saunders et al., 2019).

Again, in quantitative methods the causal link between variables leads enables he testing of hypotheses, hence the process and line of reasoning can be rigid and dependent on existing theories. In contrast, the qualitative method is flexible in providing answers to the research question(s). Moreover, researchers have argued that research quality, especially in the social sciences can be improved by using more than one approach (Easterby-Smith et al., 2015; Saunders et al., 2019). This research adopts a quantitative research approach based on the specific needs of this investigation. The quality of research findings is an ongoing endeavour among researchers, and especially research funding bodies. This has resulted in different, albeit parallel measures such

as data/literature source credibility, dependability, authenticity, and transferability. Research triangulation is one approach advocated by researchers to improve the quality of research, though not without some limitations with emphasis on increasing ethical demands, increased researcher timings and the possibility of increased subjectivity from investigator-triangulation approach.

Triangulation was not adopted because of the following concerns. Research triangulation has some limitations especially with the designs adopted by researchers as they are often not explicitly explained in the literature (Casey & Murphy, 2009). This raises some concerns for consideration, especially as triangulation is not intended to improve a flawed study (Thurmond, 2001). Thus, the first concern is related to research ethics, as there is the tendency that more ethical issues might need to be attended to with triangulation (e.g., Murad, 2014) especially when it involves different ages or sex of participants (Cannella & Lincoln, 2018; Lincoln et al., 2018) and this can increase the timing of the research (Thurmond, 2001).

Second, research is a capital-intensive endeavour (Easterby-Smith et al., 2015), hence the need to balance the benefits of the research and the added cost as a result of triangulation, as research funding bodies might not be willing to increase financial spend on the same research based on achieving more information credibility and validity, especially for researches aimed at initially exploring the dimensions of a phenomenon as the current study.

Third, there is also the possibility of increased subjectivity especially from individual investigator's assumptions in investigator-triangulation approach. Though, this third limitation is a personal view, it thus calls for the need to ensure that researcher subjectivity must be addressed throughout the research process to avoid the above effect on the researcher outcomes. The need for adequate planning to avoid multiplicity of errors was also advocated in Thurmond (2001).

Also, there is the concern that triangulation is still not able to address “scientific-ness and exactness” (Oppermann, 2000), mainly due to the varied approaches with inexplicit explanation of the triangulation design adopted by some researchers (Casey & Murphy, 2009). Scientific-ness simply refers to the adherence of research process to scientific principles, methodologies, and rigorous investigation in the pursuit of knowledge and understanding. By exactness, implies precision and accuracy in measurements, observations, and the formulation of scientific theories, ensuring reproducibility and minimizing uncertainties in scientific findings. Lastly, because this research develops a model using existing concepts with well-developed measurable dimensions, the need to reinvent the wheel by developing new concepts will be time-wasting.

Rational for Adopting Quantitative Approach

This research adopts an objective ontological paradigm to examine the relationship between the concepts of study, and between their dimensions as realities in project teams in the industry of sudy. The epistemological philosophy adopted is positivism. It is positivist, because of the use of deductive approach and quantitative methods to understand causal relationships (Easterby-Smith et al., 2015). This research involves extensive literature review, followed by the development of hypotheses from the reviewed literature based on the objectives set forth earlier. Ultimately, the sampling procedure and survey instrument adopted based on the above assumptions can be used to obtain the data that will be analysed to either accept or reject the hypotheses (Easterby-Smith et al., 2015; Saunders et al., 2019; Sekaran & Bougie, 2016).

Literature evidence suggests that previous culture-related studies in construction industries are conducted using quantitative methods involving surveys (Li, 2022). In line with the specific characteristics of the current research explained above, a quantitative method is adopted because of the attributes defined in the literature (e.g., Sekaran & Bougie, 2016; Easterby-Smith et al.,

2015). These include (i) hypotheses development; (ii) the collection and analysis of numerical data; (iii) using statistics to test the hypotheses; and (iv) developing models from the research outcomes with statistical evidence. All these are applicable in this study. Again, as a characteristic of quantitative method to collect reliable numerical data, a closed-ended survey instrument is adopted and distributed cross-sectionally. The questions are linked to the measurable variables for the concepts of study. Furthermore, this investigation is quantitative because it is causal in nature as it attempts to explain the cause-effect (positivism) relationship between variables. The descriptive approach will enhance the discussion of the results.

Population and Sample of the Research Study

There was a need to study the interrelationship between cross-cultural factors in project teams, leadership, organizational culture, and project team effectiveness as a research construct for the industry. This kind of study would be beneficial in auditing project team effectiveness after project completion, providing valuable insights for future project team leadership, leading to cost-saving measures. However, there was no such study yet, and this research addressed this gap.

The research focuses on the multinational oil and gas energy firms in Nigeria, where large-scale projects are prevalent. In the construction sector, project teams typically consist of varying sizes, ranging from fewer than 100 to more than 100 members (Alladi & Iyyunni, 2015). There were occasions when the team could be small in size with 10 members. However, this research was designed to access 210 participants who had worked in project teams with up to one or more years of experience. Only participants who could provide informed consent for themselves were included. Individuals who had a mental disability and were not able to provide their own consent were not recruited for the study. The project team was made up of employees with varied professions – engineers, nurses, legal staff, accountants, business planners, cooks, etc. Also, the

nationalities of the members of the team also varied, creating a cross-cultural setting within the team, which was the main predictor variable in this study. An initial online version of the questionnaire was sent out to 50 participants, but the outcome suggested that multiple submissions were made by the same participant through the computer IP address. Hence, the 210 questionnaires were administered by hand through the project or site manager who acted as a gatekeepe.

Sample Size Design

There were several approaches in the design of the sample size based on the need of the study. In studies involving structural equation modeling, 160 to 300 datasets were suggested in the literature (Memon et al., 2020). The '10-times the maximum predictors' rule was proposed in the literature and later accepted for PLS-SEM (Barclay et al., 1995). For this work, the moderator combined the four factors of cross-culture times four factors organizational culture to arrive at a maximum of 16 factors, where the 10-times rule gave a maximum of 160 samples. For a population size of 200 which was within the population of project teams in the industry, a sample size of 132 was suggested in the literature (Sekaran & Bougie, 2016).

Power analysis was used to establish the minimum sample size by considering the part of a model with the largest number of predictors (Roldán & Sánchez-Franco, 2012). It required information related to power, effect size, and significance level to calculate the minimum required sample size (Hair et al., 2019). Power (1-β error probability) helped to reject the null hypothesis when it is false (Sekaran & Bougie, 2016). An alpha level of 0.05 was adopted to prevent Type I error, where the hypothesis was accepted instead of being rejected. In social science research, 80 percent or more is usually adopted as an satisfactory power level (Cohen, 1988). Thus, the statistical power of 80 percent was adopted since it was exploratory as explained in the literature (Cohen, 1988; Cohen et al., 2003).

The use of computer program for determining research effect size based on *a priori* sample size was advocated in the literature (Cohen et al., 2003). G*Power software, developed by Faul et al. (2007) as a sample size estimating software, is often the first choice for business and social science researchers (Hair et al., 2017). The F tests - linear multiple regression fixed model in the software, was adopted with R^2 deviation from zero to measure the effect of predicting variable on the effect. The R^2 deviation of 0.25 from zero was targeted in the research, especially for the project team effectiveness which was the main outcome of this research. In predicting stock returns, an R^2 value of 0.10 has been considered satisfactory (Raithel et al., 2012).

Thus, the ability of the predictor variables in the study to predict 25 percent variation in project team effectiveness was satisfactory and can explain how project delays arising from non-effective teams can impact on project performance. R^2 value of 0.25 was considered appropriate in business research because it implies that the predictor accounts for a quarter of the variance in the outcome (Ozer, 1985). For instance, if an initial project cost of $1million is escalated by 25 percent because of poor team effectiveness resulting from cross-culture, leadership behaviour and organizational culture, that amounts to $250,000, which is a huge lost to the project owners. To determine the sample size in G*Power, the required effect size was estimated as per the relations suggested and developed in Cohen (1988) in Equations 3.1, 3.2 and 3.2.

$$R^{2}_{y,x} = 1-(f^{2}+1)^{-S} \qquad 3.1$$

From equation 3.1, the effect size, f^2 can be calculated using equation 3.2b below.

$$f^{2} = \left(\frac{1}{(1-R^{2}_{y,x})}\right)^{\frac{1}{S}} - 1 \qquad 3.2$$

where S is defined as follows:

$$S = \sqrt{\frac{k_{\$}^{!} k_{"}^{!} - 4}{k_{\$}^{!} + k_{"}^{!} - 5}} \qquad 3.3$$

where $k_{\$}$ and $k_{"}$ are the variables of both the predictors that are being paralleled, respectively. As explained earlier, $k_{"} \times k_{\$}$ are the 16 moderator variables calculated as the product of the variables of organizational culture ($k_{"}$) and cross-culture ($k_{\$}$). The expected theoretical coefficient of determination as explained earlier is 25%, hence $R_{"\$}^{!}$ is 0.25. For these input values, the effect size $f^{!}$ is estimated as 0.1. The output in Table 3.1, was generated using G*Power with the effect size of 0.1, calculated from Equation 3.2.

Table 3.1

*Results of sample size estimation from G*Power*

	Parameter	Value
Input	Effect size f²	0.10
	α error probability	0.05
	Power (1-β error probability)	0.8
	Number of predictors	16
Output	Noncentrality parameter λ	20.7
	Critical F	1.697
	Numerator df	16
	Denominator df	190
	Total sample size	**207**
	Actual power	0.80175

The minimum sample size of 207 from Table 3.1, is in order with the recommendation of 160 to 300 in the literature. Thus, the adopted sample size of 210 in this study was adequate. The parameters are defined as follows.

Effect size f²: The effect size identifies the strength of the conclusions resulting from the causal relationships in study. The effect size is defined in Cohen (1988) as follows: small f^{2} = 0.02,

medium f^2=0.15 and large f^2 = 0.35. Hence, the effect size used is small to medium, which is supported in the literature.

α error probability: To minimise Type-I error, it was advisable to set the value of alpha (*α)* to 0.05. This research used α=0.05.

Power (1-β error probability): The statistical power is the probability of accurately rejecting the null hypothesis and detecting a statistical significance if present, by minimising Type II error (Sekaran & Bougie, 2016). The literature emphasized that the statistical power is directly related to the sample size. The study adopted a power of 80% because it was exploratory in nature, and the population of project teams varies with the size of the project, hence it is difficult to estimate the full characteristics of the population as it relates to the research.

Number of predictors: This is an input parameter that is employed to define the adequacy of the sample size in predicting a variance in the expected effect.

Numerator df: The degree of freedom of the numerator is computed from the product of $k_{"}$ and $k_{\$}$.

Denominator df: This is the degree of freedom of the denominator, estimated from a relationship that involves an interpolative process as discussed in the literature (Cohen, 1988).

Noncentrality parameter λ: This is an output parameter that is directly related to the effect size and estimated from $\lambda = f(numerator\ df) * denominator\ df + 1)$. Thus, the value of 20.7 estimated inTable 3.1 is in order.

Critical F: This is the rejection region for the F-statistic computed based on the effect size. For this study, the critical F value can be obtained as 1.697.

Total sample size: This is the sample size estimated by the software based on the input variables discussed earlier.

Actual power: This is the actual power determined from the sample size. In this case, the actual power is 0.80175.

Materials/Instrumentation of Research Tool

The data collection tool was operationalization by relying on the definition of the study concepts and hypotheses connected to this research. From the theoretical expressions in the literature relating to this investigation, the theoretical framework is developed and explained as follows.

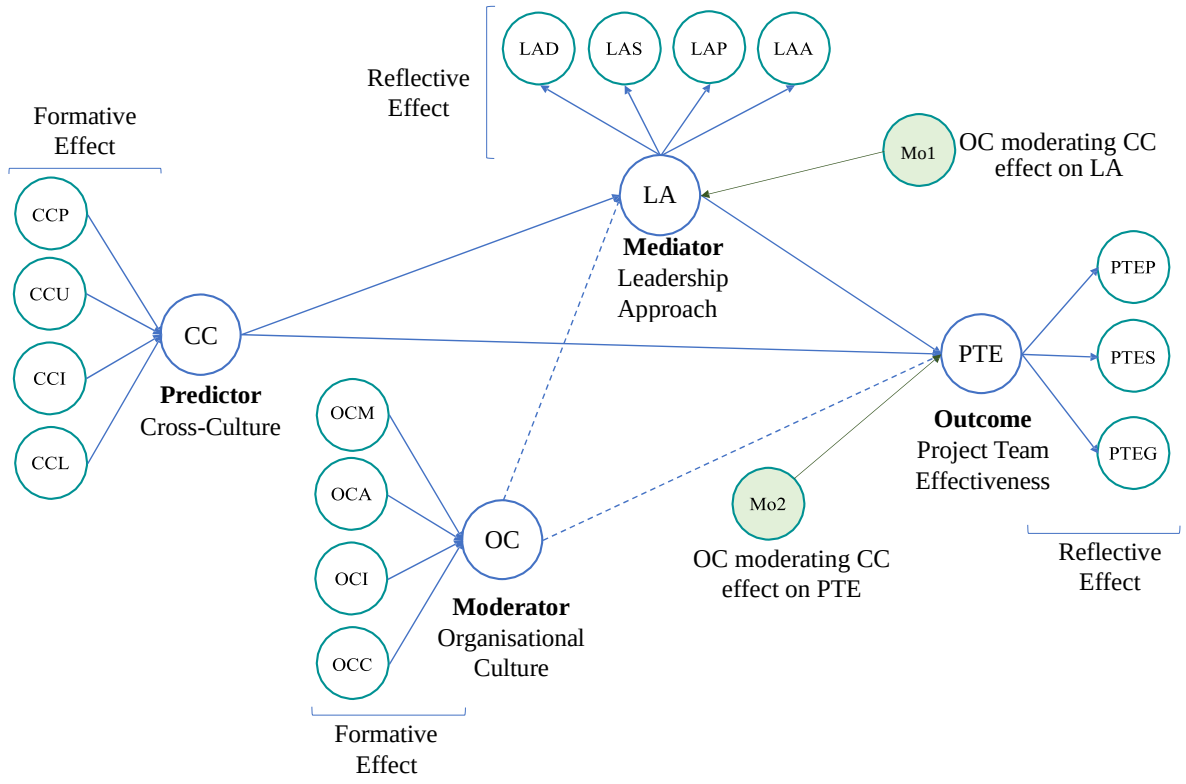
Study Construct and Measurements

The research SEM that was simulated in SmartPLS® software version 3.0 is presented in

Figure 3.1**,** below. Each construct is explained hereafter; providing the operationalized measured variables and what each coding imply, as discuused earlier in chapter 2.

Figure 3.1

Research Model



Cross-Culture

"Culture is the collective programming of the mind that distinguishes the members of one group or category of people from others" (Hofstede, 2011, p. 3). This concept explains how people from different cultural beliefs and assumptions interact to create a team culture. This team culture is moderated by the organizational culture in this investigation to ensure that the norms that defines the expected behaviour in the team is controlled by organizational policies. In this study, a formative construct is adopted for cross-culture as a latent variable in the structural equation model developed in this work and coded as "CC" in Table 3.2. As seen above, cross-culture is dependent on the dimensions measured. The coding of the dimensions using the "CC" and the first letter of the dimensions are as follows: uncertainty avoidance (CCU), power distance (CCP), individualism – collectivism (CCI), and long term – short term orientation (CCL). The cross-cultural dimensions adopted in this study are from the works of Hofstede (see: Hofstede, 2011).

Table 3.2

Operationalization of cross-cultural dimensions

Cross-Cultural Dimensions	Operationalization
Power Distance	Existence of inequality from top to bottom of the leadership hierarchy.
Uncertainty Avoidance	Consistent need for clarity of roles and structure of the team.
Individualism vs Collectivism	Existence of in-group and out-group, relationship with leadership prevail over the task.
Long-Term vs Short-Term Orientation	Presence of high level of adaptation to change

Leadership Approach

Leadership "is a major force that influences goals, the amount of involvement with and commitment to productivity, the amount of creativity in solving problems, and the degree of satisfaction from work" (Blake & Mouton 1981, p.440). As a mediating construct, the regressed effect of cross-culture on project team effectiveness is expected to be reduced by the presence of leadership with a possible improvement in the effectiveness of the team. The variables identified earlier based on the adopted path-goal leadership theory are operationalised as presented in Table 3.3. In this research, a reflective construct is adopted for the leadership approach as a latent variable in the structural equation model and coded as "LA."

As seen from the discussions above, the leadership approach is not a sum of all the leadership styles but reflects on the factorial loadings of the adopted leadership behaviour which is contingent on the assessment of task-subordinate characteristics. In projects, effective leadership is contingent upon the assessment of task-subordinate characteristics. This assessment involves understanding the nature of the task at hand, the abilities and motivations of the subordinates, and the overall context in which the leadership is taking place. This construct can identify the high-

rating leadership behaviour that influences the behaviour of the team. The coding of the dimensions using the "LA" and the first letter of the dimensions are as follows: directive (LAD), supportive (LAS), participative (LAP), and achievement-oriented (LAA). Questions are linked to the expected direction of the study, which focuses mainly on the positive impact of leader-followers' interactions on the effectiveness of the team. This is aimed at obtaining valuable insights and contribute to understanding the dynamics of successful teamwork.

Table 3.3

Operationalization of path-goal leadership variables

Leadership Styles	**Operationalization**
Directive	Leadership explains the key performance indicators to subordinates.
Supportive	Leadership assists subordinates to overcome problems that stop them from carrying out their tasks.
Participative	Subordinates ask leadership for clarity and suggestions on every decision that is made on project quality).
Achievement-oriented	Leadership constantly set challenging goals throughout the project duration.

Project Team Effectiveness

Team effectiveness have been defined from the angle of the socializing process, group experience, and productive output (Wageman et al., 2005). Accordingly, the literature explained team effectiveness as the team's output consistently meeting specified quality, quantity, and timeliness; socializing among team members enhancing their capability to work together interdependently with minimal supervision; and team interactions. This variable is the main independent latent variable, and it questions for this study were derived from the team diagnostics

survey tool in Wageman et al. (2005), comprising of three key aspects of team effectiveness – productive output (PTEP), socializing process (PTES) and group experience (PTEG). A reflective measurement approach Table 3.4, was adopted for this construct to express the three criteria as the outcome of an effective project team. Hence each of the criteria is distinct as output predictions and helps the research to achieve the purpose of predicting project success and the relative direction of the success. Consequently, the questions have been derived as follows.

Table 3.4

Operationalization of team effectiveness measurement variables

Project Team Effectiveness	**Operationalization**
Productive Output	Team's output consistently meets specified project quality (time, cost, and scope)
Socializing Process	Socializing enhances members' capability to work together interdependently with minimal supervision
Group Experience	Interaction within the team contributes positively to individual's learning and wellbeing.

Organizational Culture

This concept is defined " as the accumulated shared learning of a given group, covering behavioural, emotional, and cognitive elements of the group members' total psychological functioning" (Schein, 2004, p. 17). As a moderator in this study, it implies that the relationship between CCD, LA, and PTE depends on organizational culture. "OC" is an acronym for organizational culture adopted in this investigation construct in chapter 2, and the measured variables have the first letter from the four quadrants of the Denison model – Mission, Adaptability, Involvement and Consistency, added to "OC." The four measured variables – OCM, OCA, OCI and OCC, have been operationalised as defined in Table 3.5. The variables formative

components of organizational culture since this study treats organizational culture as a holistic concept comprising of multiples values and assumptions present in project teams. As a moderator of the cross-cultural dimensions in the current study, it is likely that OC will positively influence the LA and PTE. The questions are developed from the website of Denison Consulting LLC (Consulting, n.d.).

Table 3.5

Operationalization of Organizational Culture

Organizational Culture	**Operationalization**
Mission	Goals and objectives are clearly defined, and team members understand the vision of the organization.
Adaptability	Team members consistently and positively respond to project change process through organizational learning.
Involvement	Team members are aligned and engaged through empowerment and continual capability/competency enhancementt.
Consistency	Organizational values, systems, and processes in are in place to enhance, coordination, agreement and integration.

Study Procedures and Ethical Assurances

Participants

As an exploratory study meant for providing insight into the high-rating factors influencing the project performance, the concern is focused on parameter estimates. The significance level will be reported alongside the regression and correlation analysis, and interpreted as such: that is, the possible percentage of affirmation from the population. Project team sizes are small for effectiveness and reporting. However, for project teams in the oil and gas industry, the contractor personnel are part of the team. The population of project teams varies from project to project.

In some cases, projects can be executed by a team of 100 members or above in the oil and gas industry. This number is comprised of both contractors' and client staff. In reality, large team size up to 600 members is comprised of sub-teams with smaller team size depending on the task to be accomplished. Project teams are made up of employees with varied professions –engineers, nurses, legal staff, accountants, business planners, cooks, etc. Also, the nationalities of the members of the team also varies, creating a cross-cultural setting withing the team, which is the main predictor variable.

For the study, 210 workers who are 30 to 60 years of age participated in the study. Participants are those who have up to 1-year of experience in construction projects in the organizations of interest. This criterion is determined by the inclusion criteria and the difficulty of assessing the actual number of project workers in the industry of study. The main inclusion criterion is that participants must have at least one year of experience in project activities in the industry. Those with less than one year of experience in project activities will not be included to ensure the participants have the required experience to understand project dynamics. It is also because most organizations have a one-year probation policy for new employees. Participants will be identified and briefed prior to the interview in line with research ethical requirements. This research will be carried out in oil field project installations in the Niger Delta where the activities of multinationals in the oil and gas industry are predominant in Nigeria. Furthermore, the study was guided by the research ethical codes and procedures of the Unicaf University in Zambia on recruitment of participants.

Sampling Technique

The sampling method informed the sampling strategy. For a quantitative method where the representativeness of the sample size was of importance, data collection depended on the adopted

sampling strategy and determined the selection of participants (Sekaran & Bougie, 2016). Sampling was the means of accessing an appropriate fraction of the population due to constraints such as costs, time, and resources. Nevertheless, the adopted method depended on the specific requirements of the research. The five-stage sampling technique suggested in Sekaran and Bougie (2016) was adopted. These stages included: (1) defining the population, (2) determining the sample frame, (3) determining the sampling design, (4) determining the suitable sample size, and (5) performing the sampling process. These stages also established the inclusion/exclusion criteria. These stages, as they related to the study, were as follows:

Defining the population: The population characteristics of the workforce in the industry typically include individuals involved in various aspects of construction within this sector, possessing diverse skills and experience levels relevant to the field, and often operating within a dynamic and specialized work environment. Though the total number of the population of construction project teams in the oil and gas industry in Nigeria was difficult to ascertain, the population was categorized by job positions, multi-cultures, gender differences, salary levels, and other strata of differentiation.

According to the Nigerian Content Development and Monitoring Board (NCDMB), the workforce registered with the board in this industry consists of 98% Nigerians and 2% expatriates. Among them, 57% are engineers and 43% are non-engineers (NCDMB, n.d.). Furthermore, there is an 81% female and 19% male distribution. Additionally, 70% of individuals fall within the 21-40 age bracket, indicating a significant proportion of the active population.

However, these demographic divisions did not serve as the basis for evaluating the results, as not all individuals within these categories are actively involved in projects. Nonetheless, they offer insights into the composition of the research population. This was because the essence of the

study was to have a holistic insight into the relationship that existed in a project environment between the variables of the study.

Determining the sample frame: Primary data was utilized because of the specific need of the study. Whereas secondary data can be utilized in quantitative methods, research employing secondary data significantly relies on the source and methodology used for data collection, thereby necessitating careful consideration to ensure reliability and validity (Saunders et al., 2019). The sample frame represented a unique characteristic of the population. In this thesis, the participants consisted of individuals with one or more years of experience in construction projects within the industry.

Determining the sampling design: In this study, the need to develop a model from the results that would be used to audit project teams based on cross-cultural factors in the team was obvious. It was important to select participants with the right inclusion criteria. Hence, a blind selection process where the researcher had no influence was adopted to obtain the right results from the right people.

Determining the appropriate sample size: An appropriate sample size is dependent on several factors such as the confidence interval and level, and the amount of variability in the population. An appropriate sample size was dependent on several factors such as the confidence interval and level, and the amount of variability in the population. A minimum R-squared variability of 0.25 was adopted in this investigation as appropriate to define the significance of the predictor on the outcome.

The sample size was estimated with an alpha level of 0.05, to minimize Type I error, and a power of 0.8, to minimize Type II error. Type I error happened when the null hypothesis was wrongly rejected, and Type II error occurred when the null hypothesis was incorrectly accepted.

Although the hypotheses were stated as one-tailed with emphasis on the expected positive relationship between variables, the hypotheses were tested with two-tailed analysis. This was done to allow for the likelihood of a relationship in the opposite direction and to increase the sample size (Banerjee et al., 2009).

Executing the sampling process: The survey instrument was sent to the gatekeepers and informed to send it to the participants meeting the criteria.

Ethical Assurances

Research ethics governance is the process of ensuring that all possible risks associated of the research has been appraised by a competent body with recommendations on how to reduce the risks or totally abandoning the study (Bordens & Abbott, 2018; Saunders et al., 2019). Moreover, this ethics governing process is being challenged as bureaucratic (Easterby-Smith et al., 2015). Despite this concern, the need for a universal ethical standard for research on humans is generally advocated in all research literature (e.g, Bordens & Abbott, 2018; Easterby-Smith et al., 2015; Saunders et al., 2019), especially from the "highly-developed" literature on biomedical research ethics (Mamotte & Wassenaar, 2009).

Again, Benatar and Singer (2002) expresses the need for a universal ethical standard to: (1) define the "best interest" of participants based on cultural variance; (2) distinguish what is "truly universal" from the viewpoint of imperialists; and (3) outline what determines morality on the basis of ethical relativism. Thus, to improve on the three concerns raised by Benatar above, Brunger and Burgess (2005) suggest a cultural framework that enables the identification of imperialists factors such as, influence from funding agencies and industry or influence of "disease-based and community-based" groups, that can negatively impact on the expected neutrality of research ethics governance by ethic committees and concentrate on the risks on the subjects. Again,

the safety of researchers is also considered during the ethical assessment process (Saunders et al., 2019).

As discussed in the last section, “ethics review, ethical regulations and guidelines, and forms….” (Brunger & Burgess, 2005), raises the need for a set of ethical principles. These will be discussed further under four main headings: Beneficence, Non-maleficence, Respect for the rights of participants and Justice.

Beneficence: Gaining access to data depends on the integrity of the researcher (Easterby-Smith et al., 2015). Hence, an ethical approval can prove that a researcher is competent to carry out the study and that the research is beneficial to the participants. Therefore, to enhance the quality of the research outcome, it is an ethical demand on the researcher to avoid “deception, dishonesty” and “misrepresentation” of data and analysis of data, and to promote openness and truth by declaring “any conflict of interest or commercial association” as the case may be (Saunders et al., 2019), to avoid research bias in the findings.

Avoidance of harm (non-maleficence): Harm to participants is defined as “associated risks,” which can negatively impact on their “emotional well-being, mental or physical health, or social or group cohesion.” It is an ethical demand to avoid any form of harm either from the research method or the violation of confidentiality and/or anonymity, or through harassment (e.g., sexual) or discrimination (e.g., gender, race). Moreover, Roth and von Unger (2018) argued that true anonymity is possible if the researcher has no knowledge of the identity of participants. Whereas some researchers prefer to depend on the request by the participants on anonymity and data protection (Surmiak, 2018), it is important that anonymity and data protection must be sustained during research and publication.

Respect for rights of others: Participants trusts the researcher with the information they provide and expects the researcher to demonstrate respect to them and their information. Implying further that their rights must be recognised, and their individual or collective dignity respected. These include informed consent, right to participate and withdraw at any stage of the research, free from pressure or coercion, and rights to privacy among other rights discussed extensively in the literature (Saunders et al., 2019). Even so, as it is a "social responsibility" demand on the researcher to respect these obligations.

Justice: This simply imply fairness to the participants and ensuring that they get justice when their rights are violated (Denzin, 1989). It is imperative that all data source (individuals and organizations) must be anonymous as this can enhance the reliability of the data from participants when they are certain that their confidentiality and anonymity will not be compromised (Surmiak, 2018), except there is explicit agreement to undermine anonymity (Saunders et al., 2016). However, it is equally important for a proactive approach to addressing inequalities in research as what constitutes a fair and reasonable standard of care is currently seen as subjective and debatable (Benatar & Singer, 2002). This is because there are significant ethical challenges in research that include vulnerable research participants such as those with disabilities and learning/cognitive difficulties (Surmiak, 2018).

Based on the above principles, it is important that the actions needed for a good ethical behaviour are spelt out throughout the stages of the research process - from inception to report writing/publication, as discussed farther in the next section.

Adopted Actions to Promote Good Ethical Behaviour

The above principles are further discussed based on the stages of the adopted research process, which include formulating and clarifying the research topic, study design, gaining access

and data collection, data processing and storage, data analysis and reporting the findings (Saunders et al., 2019).

Formulating and clarifying the research topic: At this stage, the integrity and objectivity of the researcher is important as these are key competences (Easterby-Smith et al., 2015). Here, the concern included the responsibilities towards the participants, the attendant risks and possible conflicting interests are recognised.

Research design and gaining access: This was evaluated to ensure the absence of coercion by the researcher or the gatekeeper providing access to the data. Furthermore, the participants' rights to be informed, ask questions, and maintain privacy were guaranteed. All ethics forms were submitted for review by the ethics committee and received approval.

Data collection: During this process. it was ensured that all the rights of the participants discussed above were guaranteed. It was also crucial at this stage to respect the right to confidentiality and anonymity of all participants, while firmly avoiding coercion to obtain information. Moreover, all individuals had the freedom to engage or opt out of the survey activity before the outcomes were disclosed. Only those participants capable of offering informed consent for themselves were included. Individuals who had a mental disability and were unable to provide their own consent were not permitted to part of the study.

Data processing and storage: As with previous stages, objectivity, confidentiality, and anonymity bwere maintained. All agreed consents were observed, and it was the responsibility of the researcher to continually verify and secure the data.

Data analysis and reporting the findings: At this final stage of the research process, all rights discussed above were still maintained. More so, participants' right to withdraw was still possible until the findings were published.

Data Collection

In quantitative research, as outlined by Saunders et al (2019), data collection methods involves: (i) experimentally manipulating variables to yield time-dependent results, among other techniques; (ii) structured observation of the behavior of participants under a defined setting in the workplace; (iii) secondary data that investigated relationships among variables using existing data; and (iv) survey, when a large number of participants were required in the study without longitudinal time-dependent observation of variables.

Consequently, the data collection for this investigation was favoured by the fourth approach only because of the unique construct involving the concepts of the proposed study. The goal was to retrieve primary data through a large number of responses from participants using ordered scale measurement questions from the operationalized dimensions of the four concepts (latent variables) in the research construct to enhance objectivity and generalizability. Hence, the aim and objectives of the proposed study were achieved by cross-sectional administration of a structured closed-ended survey questionnaire to project team members who were directly involved in project activities in the industry. Since the average size of project teams in the industry could be up to 100 team members, the sample size of 210 participants was considered satisfactory. The collected data included demographic and project-related experience. The demographic data provided insight for explaining the cross-cultural domain.

Data Analysis

Data analysis is rigorous and scientific and dependent on the application of statistics, mathematical relations, accurate data measurement, logical inference, theoretical constructs and hypotheses testing, experience with data, intuition of the data analyst, and field of study (Hair et al., 2017). Statistics is employed in quantitative studies because it creates a better understanding

of the underlying pattern in a data set. Statistical analysis is made easier by the variety of software applications that enhance usability and makes the process of data analysis efficient, time saving and cost effective (Hair et al., 2017).

In this investigation, the analysis of data was accomplished as follows. First, descriptive statistics were employed to determine the mean and variability represented by the standard deviation within the sample size. This provided insight into the variability and consistency of the responses. Basic demographic data were collected to provide insight into the nature of the participants. A network analysis approach was used to provide a basic overview of the controlling factors of the project environment. Network analysis presented the visualized form of the relatedness of the studied dimensions in a graphical pattern. The results from the expected influence chart of the network model were used to clarify the outcome of the inter-correlation among the latent variables.

Secondly, the hypotheses were tested based on the outcome of the SEM path coefficients. An analysis of the loadings of the dimensions of each concept in the construct was conducted, and path analysis for the suggested strength of the relationship in the SEM was performed. Quality analysis of the SEM was achieved using the indicators discussed in the literature (Hair et al., 2017).

Drawing upon the theoretical framework established, a path analysis was used to explore the mediating influence of Path-Goal leadership within the construct. The adopted software included IBM SPSS® for data entry, correlation, and regression studies. JASP® (Team, 2020) software was adopted for network analyses, and SmartPLS® (Ringle et al., 2015) for structural equation modelling. Details of the adopted statistical approaches and the rationale behind their implementation were discussed further..

Descriptive Statistics

The purpose of descriptive statistics was to obtain basic descriptive statistics of the data set using measures of central tendency, and other analyses such as histograms and density plots, correlation plots, box plots, and frequency tables. However, when data were measured on an interval or ratio scale, the mean remained the favored method of describing central tendency (Mertler & Reinhart, 2016). Therefore, the analysis of the datasets relied on the mean as a foundational metric, along with the standard deviation indicating the deviation of measures from this mean. This approach was used to provide a preliminary ranking of the dimensions that influenced the project environment.

Network Analysis

Network analysis provided a means to visualize the correlation matrix of the dataset by directly determining the relationship between measured variables (Epskamp et al., 2012; van den Bergh, 2018). Each node of the directed graph represented a dimension of the latent variables, and each edge represented a correlation between two dimensions. The stronger the correlation, the edge became thicker and more saturated (Epskamp et al., 2012). Centrality measures defined the strength of the relations. Higher centrality measures determined the nodes that were central to the network, and for this research, these nodes were the dimensions defining the success of the project. Generally, the centrality tests estimated the distance between the nodes, and the node with increasing short distances passing through it was also higher in the graph. Hence, the order of ranking for each dimension was based on the higher value in each centrality test.

Structural Equation Modelling

This is a statistical method that measures and analyses the relationships of both measured and latent variables. The purpose of SEM is to enhance accurate conceptualization of the theory

under study (Rigdon, 2016). Through SEM, the regression and correlation among the variables are measured with ease and flexibility, while also providing measurement errors resulting from extraneous variables that were not measured but can potentially affect the results of the model. Through path analysis, the patterns of the effect along the causal link between the latent variables is investigated and to provide estimates of the magnitude and significance of hypothesized causal connections between the latent variables in the model. Path analysis is achieved by treating each linked hypothesized separately.

Two main SEM analysing techniques are available in the literature: covariance-based SEM (CB-SEM) and Partial least square SEM (PLS-SEM). These SEM methods differ in application based on the assumptions on how the concepts are mapped to the conceptual models in statistical analysis. Both approaches have been discussed extensively in the literature (Hair et al., 2019, 2020; Liengaard et al., 2021; Nam et al., 2018; Sarstedt et al., 2016). Below, the details of their advantages, disadvantages and application and the justification for choosing PLS-SEM in this doctoral research will be discussed.

Partial Least Square SEM: To empirically represent the conceptual/latent variables in the construct, PLS-SEM uses the total variance of the measured variables of each concept to develop regressed linear combinations of all measured variables, resulting in composite variables that can be correlated to the conceptual variable (Hair & Sarstedt, 2019). Hence, PLS-SEM only creates composite proxies.

Thus, as a variance-based estimator, PLS creates linear combinations of the indicators as proxies of the theoretical concepts and then estimate the parameters of the model (Benitez et al., 2020). The use of PLS is favoured when it is difficult to determine if the actual structure of the measured data is common-factor (reflective) or composite-based (formative) (Sarstedt et al.,

2016). The software identified with the capability for PLS-SEM in this study is SmartPLS®. There is ongoing interest on the study of the benefits and limitations of PLS as indicated by recent volume of literature on the subject. Whereas some researchers support the use of PLS (Hair, 2021; Rigdon et al., 2017), others disagree, especially on its application in psychological research that the estimates and path-analysis results are biased because of the composite-based estimation of variances of the indicators (Antonakis et al., 2010). However, the choice of which SEM approach to use is dependent on the nature of the population where the sample is drawn (Hair & Sarstedt, 2019; Rigdon, 2016; Rigdon et al., 2017).

The benefits of PLS-SEM include: (i) capable of SEM analysis with small size of data in situations where a suitable large data is not obtainable and there is need for an exploratory study of the interlinked concepts; (ii) when it is not known if the indicators of the concept of study exhibit conditional multivariate normality for maximum likelihood estimates; and (iii) favourable in conditions when the latent variable is dependent on the measured data. One important aspect of PLS-SEM is maximizing correlation through a composite weighting process (Rigdon, 2016). However, there are concerns with the use of PLS path modelling approach, especially not accounting for measurement errors (Rigdon et al., 2017). Recent updated argument in favour of PLS-SEM for confirmatory and explanatory purpose, indicates that arguments against the use of PLS is based on wrong research design where PLS have been used to provide estimates on a factor-based population (Benitez et al., 2020).

In the current research, the effort is not to exhaustively measure all indicators of the concepts of study, but to provide a likelihood of the presence of the concept in the project team, hence the numbers of indicators from the literature measured are assumed to have sufficiently define the construct.

Covariance-Based SEM: CB-SEM are also known as factor-based models, and empirically represents the latent variables in the construct using common factors that have been derived from the common variance of their measured variables to provide insight into the covariance between each concept and their respective measured variables (Hair & Sarstedt, 2019). The software mostly used in this analysis is IBM/SPSS AMOS®.

The main argument in favour of CB-SEM parameters estimates is that the discrepancy between the conceptualised empirical and model estimated variance–covariance matrix of the measured indicators is minimized through implied "measurement errors" (Benitez et al., 2020). Measurement errors account for the variable(s) not measured, but can influence the latent variable (Rigdon, 2016; Rigdon et al., 2017). CB-SEM produces "maximum likelihood factor estimates," an analysis approach utilized in factor-based populations with normal distributions (Rigdon, 2016). Equally, for its application, a clear understanding of the nature of the population from previous studies is essential. In this study, the population remains ambiguous due to diverse project teams in terms of size, task complexity, leadership traits, and team performance metrics (El-Reedy, 2016). Consequently, employing this EM approach might result in erroneous assumptions in the modelling approach, unrealistic estimates of orrelation and regression, and possible deficiency in the path analysis.

Adopted SEM Approach and Rationale: The PLS-SEM was implemented in this work for the following reasons. First, the presence of the concepts in the study was visualized from the perspective of ontology – which is the existence of the phenomenon of study as a reality based on the data retrieved from project team members and leadership, implying that deductive inference on the concepts was dependent on the observed data. Hence, the link between the predictor and moderator indicators and their concepts had to be formative.

Second, as an auditing model, it was necessary for the model to find application in smaller projects with less than 100 team members, which was possible by PLS modelling (Hair et al., 2010). Third, it was difficult to assess if the concepts of the study were normally distributed since the population size of all projects in the industry was relatively unknown; hence, PLS was also most suitable. However, the participants in the survey had worked on various projects with an average project team size of 100 workers. For larger-sized projects, up to 600 workers, a sample size of 234 participants was recommended in the literature (Sekaran & Bougie, 2016). A similar computation was obtained using Raosoft sample size calculation online software (Raosoft, 2004), at a confidence interval of 95%, 5% margin of error and response distribution of 50%. Thus, for a smaller size as low as 100 workers, 80 participants were recommended. However, empirical evidence in the literature (Memon et al., 2020, p. 14), suggested that from 160 to 300 valid observations were appropriate for SEM.

A judgement sampling (Sekaran & Bougie, 2016) was adopted because the information required could only be provided by project team members; hence, representativeness was not the focus but to relate reality expressed by the judgmentally selected participants. From the arguments above, SmartPLS® SEM analysis software was adopted based on the assumptions and the specific needs of this research (Ringle et al., 2015). The interpretation of the effect size of the causal relationship investigated was interpreted as defined in the literature (Cohen, 1988).

SEM Quality Analysis: Structural equation modeling is usually comprised of two aspects: the validation of measurement models and fitting the structural equation model (Edwards et al., 2012). Both models were assessed to determine the validity of the model developed in this study. The formative and reflective measurement models were assessed because the assessment criteria for both were different (Hair et al., 2017). The two reflective models in this investigation were

leadership approach and project team effectiveness. They were measured as reflective because the assumption in this research was that the leadership approach determined the style of leadership, and the effectiveness of the team determined the performance outcome. As detailed in Hair et al. (2019). the assessment included the outer loadings, convergent validity, discriminant validity, and internal consistency reliability. The outer loadings were expected to provide acceptable item reliability by accounting for more than 50 per cent of the indicator's variance.

The next assessment was the internal consistency reliability, which was developed by Jöreskog (1971), is used most often because it produces higher values than Cronbach's alpha (Hair et al., 2019), and ideal for studies that are exploratory in nature. In exploratory research, reliability numbers of 0.6 to 0.7 are adequate (Hair et al., 2019). Also, 'convergent validity' is conducted to explain "…the extent to which the construct converges to explain the variance of its items" (Hair et al., 2019, p. 9). This criterion is evaluated from the average variance extracted (AVE) of the measured indicators on each construct. It is computed from the mean value of the square of each loading on the construct. The minimum acceptable value of AVE is 0.5, suggesting that greater than 50 per cent of the variance of the loadings were explaned by the research construct.

Another metric that was employed in testing the quality of the SEM is discriminant validity of the reflective constructs. This measure elucidates the practical degree to which a concept is differentiated from other concepts within the structural framework. As suggested in the literature (Fornell & Larcker, 1981), the discriminant validity of a reflective measurement model can be assessed from the difference between the square of their inter-construct correlation and their respective AVE. Based on this metric, the model is valid if the squared inter-construct correlation is less than their respective AVE. The two formative models are cross-culture and organizational culture. They were measured as formative because the assumption was that the measured

indicators determine the dominant cross-culture and organizational culture beliefs and influences the observable norms in the project team. This assessment was conducted using the variance inflator factor (VIF) metric. VIF values of 5 or above indicate the presence of critical collinearity among the indicators, implying that the indicators were empirically the same. To avoid collinearity issues, the VIF for the constructs must be lower than 3 (Hair et al., 2019).

The significance tests conducted examined the discrepancy between the data and the null hypothesis, and to guide the making of the right decision based on the data. The criterion for including an indicator is based on a significant loading of 0.5 or above (Hair et al., 2019). Once both reflective and formative measurement models are satisfactory, it was equally important that the structural model was evaluated as recommended in the vast literature on PLS-SEM (e.g., Hair et al., 2019). The conventional evaluation standards comprised the R-squared which is the coefficient of determination, the statistical significance, and the significance of the path coefficients. The literature recommends the following values for R-squared (R^2): 0.75, 0.50, and 0.25, indicating substantial, moderate, and weak relationships, respectively as explained in (Hair et al., 2011, 2019).

Hypothesis Testing

The path-coefficients of the resulting links in the SEM are the amount of change in the outcome variable for a unit of change in the predictor variables. The t-test assesses whether the beta coefficient is significantly different from zero. If the beta coefficient is not statistically significant (i.e., the t-value is not significant), the variable does not significantly predict the outcome. If the beta coefficient is significant, the sign of the beta value is examined. If the beta coefficient is positive, the interpretation is that when the predictor variable increase by 1 unit, the outcome variable will increase by the beta coefficient value. If the beta coefficient is negative, the

interpretation is that that when the predictor variable increase by 1 unit, the outcome variable will decrease by the beta coefficient value. However, the increasing concern of rejecting a null hypothesis based on $p \leq 0.05$ has led to the implementation of a combination of criteria to enable the null hypothesis "reject" or "do not reject." Thus, to overcome a "Type I error" – wrongly rejecting the null hypothesis, it is a requirement for the *p*-value to be less than an alpha level criterion of 0.05 ($\alpha = 0.05$). Also, to avoid a "Type II error" when the null hypothesis is incorrectly accepted, the *post hoc* statistical power must be equal or greater than 0.8 ($1 - \beta \geq 0.8$). The *post hoc* statistical power was calculated by means of "G*Power" software with the effect-size obtained from the simulation. Already, the *a priori* statistical power was set to 0.8 during the determination of the sample size as discussed earlier. Furthermore, the estimated Pearson correlation value, the coefficient of determination and the path coefficient for each hypothesis must be within the 95% CI with a T-statistic value greater than the critical value of 1.690 for two-tailed CI ($t_{(0.)+}$ $_{!} \geq 1.690$) and degree of freedom ($n - 1$). Also, the predicted R^2 value for both leadership approach and project team effectiveness must be greater than the theoretical R^2>=0.25 used to determine the sample size.

***Final Inference*:** The final inference during the data analysis provided information for the development of the 4-quadrant project environment, where the factors influencing project performance were derived from the ranked dimensions of each latent variable. Again, as discussed in chapter 2, a leadership-mediated, culture-driven project team effectiveness model was provided. The links to the latent variables were determined from the effect sizes obtained during the simulation of the SEM.

Summary on Chapter 3

This study aimed to explore how path-goal leadership mediated the link between cross-cultural aspects in project teams and team effectiveness, with organizational culture acting as a moderator for the cross-cultural impact. The people-driven skills of project leadership identified in the extant literature on project management; yet, no study investigated the relationship among the variables studied in this research. A quantitative research method was adopted from the positivist's epistemological philosophical perspective. The reasons for adopting this approach are discussed further. First, the subject of research was not new as there were validated theoretical and experimental models in the literature, as discussed earlier in Chapter 2. Implying that the knowledge existed, and inferences could be easily drawn from existing results.

Therefore, it was expected that the results and findings of every related research in this field of study should be objective and be devoid of any form of ambiguity, subjectivity, and speculations. Second, the research area had attracted much research interest; however, the SEM construct was unique to this research, hence an exploratory approach was adopted with no emphasis on generalizability. Third, there was a need to control the expected outcome of this study. This required fixed sets of closed-ended questions that were mapped to the selected theoretical framework to provide ranked outcomes. This justified the use of Likert scale questionnaires adopted.

Fourth, the need for post-research measurement and replication using the same structured survey instrument and method of statistical analysis should produce similar results. Especially when the findings were expected to lead to the development of cross-cultural project team and leadership policies. The operationalizations of the measured variables were as defined in Chapter 2.

The study was conducted cross-sectionally with a closed-ended Likert scale questionnaire survey data collection tool that was administered to 210 participants through a blind selection process where the researcher had no influence because of the specific inclusion and exclusion criteria. The included questions in the survey tool were ordered relying on the ontological dimensions of the four concepts in the research construct. A multi-stage investigative approach was adopted during the data analysis to reveal the correlational relationship among the dimensions of organizational culture, cross-culture, project team, and leadership, and the causal relationship between these four concepts.

The overarching purpose of this doctoral research the development of a leadership model that studies the complex relationship among the concepts in a project environment to enhance organizational performance in the industry and to provide insight into the relative relevance of the dimensions adopted for this study on project success. The study was conducted in multinational oil and gas exploration and production organizations in Nigeria, because of the visible presence of large oil and gas projects. This research was designed to access 210 participants who had worked in project teams with more up to one year's experience. Only participants who could provide informed consent for themselves were included. Individuals who had a mental disability and were not able to provide their own consent were not recruited for the study.

The 10-times rule was proposed in the literature and later accepted for PLS-SEM (Barclay et al., 1995). For this research, the moderator combined the four factors of cross-culture times four factors organizational culture to arrive at a maximum of 16 factors, where the 10-times rule gives a maximum of 160 samples. An alpha level of 0.05 was adopted to prevent Type I error, where the hypothesis was accepted instead of being rejected. A research power value of 80 percent or greater represents a satisfactory level in social science study (Cohen, 1988). The statistical power

(1-β error probability) helped to reject the null hypothesis when it was false (Sekaran & Bougie, 2016).

The outcome of the final SEM is expected to predict 25 percent variation in project team effectiveness is satisfactory and can explain how project delays arising from non-effective teams can impact on project performance. R^2 value of 0.25 is considered appropriate in business research in the because it implied that the predictor accounts for a quarter of the variance in the outcome (Ozer, 1985).

Two approaches to SEM analyses technique are the covariance-based SEM (CB-SEM) and partial least square SEM (PLS-SEM). The PLS-SEM is adopted in this work for the reasons that, the presence of the concepts in the study was visualized from the perspective of ontology – which defines the existent of the phenomenon of study as a reality based on the data retrieved from project team members and the leadership, implying that the deductive inference on the concepts was dependent on the observed data. Approach to ascertaining the quality of the SEM was also discussed. Hypothesis testing and inference were based on the measures defined in the literature (Cohen, 1988; Hair et al., 2017). The next chapter present the data analysis and the results are used to develop a 4-quadrant project environment framework and leadership mediated culture-drive project team effectiveness models..

CHAPTER 4: FINDINGS

This study explored how leadership mediates the connection between cross-cultural dimesions and project team effectiveness. The moderating effect of organizational culture on cross-culture was also investigated, resulting in a complex research construct. This industry has continued to experience the shortage of talented and highly skilled indigenous Nigerian workers (Ajayi, 2020), which is partly due to the high expertise entry level qualifications. Hence, it is unlikely to have a project without multicultural dimensions. Aside this, Nigeria has 374 ethnic groups (Mustapha, 2005), alongside various symbolic and linguistic methods for cross-cultural communication (Nsereka, 2019; Udebunu, 2011). Like every multinational project, the industry is comprised of project teams made up of interdisciplinary and multi-skilled workforce because of the multifaceted nature of the ativities of exploration and production of oil and gas (Kerzner, 2017).

The current study investigated four main concepts including leadership, project team effectiveness, cross-culture, and organizational culture. These concepts were selected based on the ontological realties existing in project environments, with emphasis on deriving axiological meaning that can enhance project delivery.

Hence, answers were provide to the three main research questions in Chapter 1, restated as follows: RQ1- What is the direct impact of CCD in a project team on PTE in the Nigerian oil and gas industry? RQ2- How does the moderating role of OC influence the leadership mediated impact of CCD on PTE? and RQ3 - How does the mediating influence of LA affect the relationship between CCD in a project team and PTE? These questions were linked to the research objectives stated in Chapter 1. In achieving the research purpose and objectives the study adopted a quantitative research method from a positivist's philosophical epistemological assumptions.

The mediated-moderated model was developed using SEM statistical technique. The theoretical underpinnings for the investigation were derived from four main theories of cross-culture ((Hofstede, 2011), path-goal leadership (House, 1971; Northouse, 2019), organizational culture (Denison et al., 2006), and team effectiveness (Hackman, 2002). The theoretical framework, as derived from the above theories, was based on detailed literature review, which laid the foundation for the operationalization of the measured variables and the development of the measurement tool.

The eight hypotheses derived from the literature in chapter 2 are tested in this chapter. The exploratory in nature of the study was informed by the fact that the outcome of the regression and correlational relationships studied in this research was not based on the principle of generalizability. This is because, the factors and dynamics of project environments vary from one project to the other. However, the study is premised on providing an auditing tool to assess project performance from the viewpoint of the four concepts presented earlier. Thus, informing the need to evaluate the people-oriented factors influencing project delivery in an environment where a mix of diversity, organizational environment and leadership behaviour defines the effectiveness of the team.

Cross-sectional data survey horizon was adopted with a closed-ended Linkert scale questionnaire data collection, which was administered to 230 participants through a blind selection process. Here, the researcher had no influence because of the specific inclusion and exclusion criteria already defined in the ethical form that was approved by Unicaf University in Zambia Research Ethics Committee (UREC). The investigation adopted “multi-stage data analysis” technique to reveal the causal and correlational relationship among the dimensions of project team effectiveness, organizational culture, cross-culture, and leadership, and the causal relationship

between these four concepts in accordance with particular requirements of the stepwise investigations.

The primary rationale behind the adopted multi-stage data analysis technique is based on the need to provide further insights into the project variables affecting project dynamcs in the industry. These variables have been ranked in order of importance using the weightings of the measured variables for the formative constructs or loadings of the measured variables for the reflective constructs. All measured variables are endogenous in nature since they evolve from the internal dynamics within the team. Exogenous variables are outside the scope of this research because external environmental factors such as funding, politics, security, etc. which also influence project success are outside the purview and control of project teams. It was not anticipated that extraneous factors will influence the study because it is exploratory, hence the partial least square SEM adopted is fit-for-purpose.

The overview of the data analysis approach adopted is presented as follows. Descriptive statistic was adopted to explain the variable across the data collected using mean, median and standard deviation. This was followed with the validity assessment for the structural equation model (SEM). The SEM simulations were first carried out on a PLS algorithm at 1000 iterations with a stop criterion of 1E-10, to ensure that the iteration converges.

To retrieve the path coefficients along the causal links, 1000 subsamples were generated using a computer algorithm bootstrapping technique This is because the PLS outcomes are nonparametric, therefore usual asymptotic significance levels cannot be computed directly, except by bootstrapping subsampling procedure. The adopted significance level classification for R-squared values and path coefficients was dependent on both *t*-statistic and *p*-value. Where the t-

statistic was the final criterion for rejecting or accepting the hypotheses. The alpha level, $\alpha = 0.05$

was defined for the study to reduce Type I error at the confidence interval of 95%CI. The analysis shows that all the predicted path coefficients and R-squared values were within two-tailed 95%CI. Type II error was minimised by implementing a statistical power of 80% as recommended in the literature for exploratory studies (Cohen, 1988).

This research tested eight (8) hypotheses. The first alternate hypothesis was stated as: *(H1a) - A significant positive relationship exists between CCD and PTE.* The intent of this hypothesis is to investigate the nature of the interaction existing between CCD and PTE.

The second alternate hypothesis was stated as follows: *(H2a) - There is a significant positive moderating effect of OC on the direct positive relationship between CCD and PTE.* This hypothesis is important because it studies the moderation interaction of OC and CCD.

The third alternate hypothesis investigated was *(H3a) - There is a significant positive relationship between LA and PTE.* H1 and H2 already examined the link between the predictor variables of CCD and OC on PTE, and the results suggest that only OC was positively and significantly linked to PTE. Both LA and PTE have been treated as reflective constructs because they are the main outcome latent variables, hence the need to also study the type of relationship existing between both concepts.

Hypothesis 4 was also important because it investigated the cause-effect link between CCD and the LA in a project setting. Thus, the fourth alternate hypothesis was stated as follows: *(H4a) – There is a significant positive relationship between CCD and LA.* The study was important because there was no significant relationship between CCD and PTE in H1, and since the CCD in the team cannot be overemphasised, and LA already has a positive and significant relationship with PTE in H3, the outcome of this hypothesis was premised on determining if LA can provide a mediating influence on the relationship between CCD and PTE.

From H3 and H4, it was already suggested that LA and PTE are positively and significantly related, and that CCD and LA are also positively and significantly related. Consequently, alternate hypothesis 5 investigated the mediating role of leadership in the connection between CCD and PTE, and was stated as follows: *(H5a) - There is a significant positive mediating effect of LA on the significant positive relationship between CCD on PTE.*

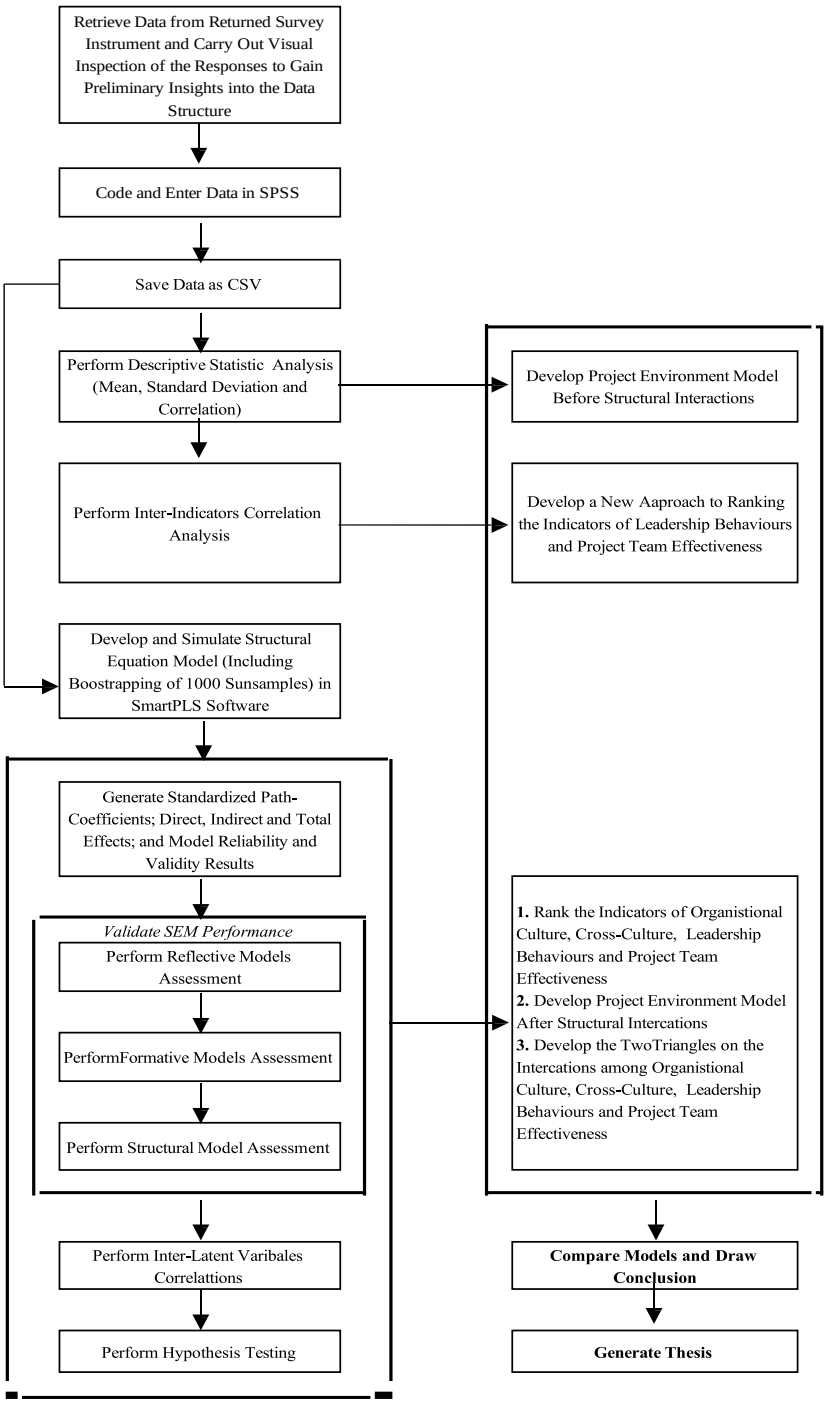
Hypothesis 6 resulted from the outcomes of H1 through H5. Earlier, the emphasis was on determining how best to explain the impact of CCD on PTE. In H5, it was possible to determine the significant mediating role of leadership to improve and define a positive and significant relationship between CCD and PTE. Thus, alternate H6a was stated as: *There is a significant positive moderating effect of OC on the LA mediated significant positive relationship between CCD and PTE.*

Hypothesis 7 is already tested as part of H6, but it is investigated here as a stand-alone effect of OC on LA, and the alternate hypothesis is stated as: *(H7a) - There is a significant positive relationship between OC and LA.*

The last alternate hypothesis is H8a, which was also confirmed as part of H6, but investigated here as a stand-alone effect of OC on PTE, and stated as follows: *(H8) - There is a significant positive relationship between OC and PTE.* Figure 4.1, presents the scope of work in this chapter.

Figure 4.1

Chptaer 4 Work Scope



The outcome of the investigation led to the definition of two scenarios of leadership mediated cultural influence on team effectiveness, termed as proactive and reactive team effectiveness models. Further analysis led to the identification of the top rating variables defining the project environment

Trustworthiness of Data

The trustworthiness of the data was investigated as suggested in the literature (Saunders et al., 2019), which informs the ontological strength of the measured data to reflect the conceptual reality of the purpose of the study. Hence, the right method, using appropriate procedures for data collection and analysis, and the evaluation of the outcomes were critically assessed to ensure the study design is fit-for-purpose. Details of the methodology adopted was discussed earlier in chapter 3, which emphasised the suitability of a quantitative approach for the study, and the use of structural equation modelling to study the interactions among the investigated organizational concepts. Furthermore, data credibility was sustained because the data entered in SPSS was compared and double-checked with the raw field data by two individuals not directly involved in the study.

To ensure knowledge transferability, the participants with the right project experience in the industry of study were selected for the study. Also, the questions in the survey tool were operationalised to fit within the context of a typical project environment where the interaction among CCD, OC, LA, and PTE defines the existing complex relationship. The adoption of the quantitative research approach and use of the SEM technique have been appropriately described in Chapter 3, as the confirmability of the structural model. This section discusses the details of the reliability and validity checks conducted on the retrieved data.

Reliability and Validity of Data

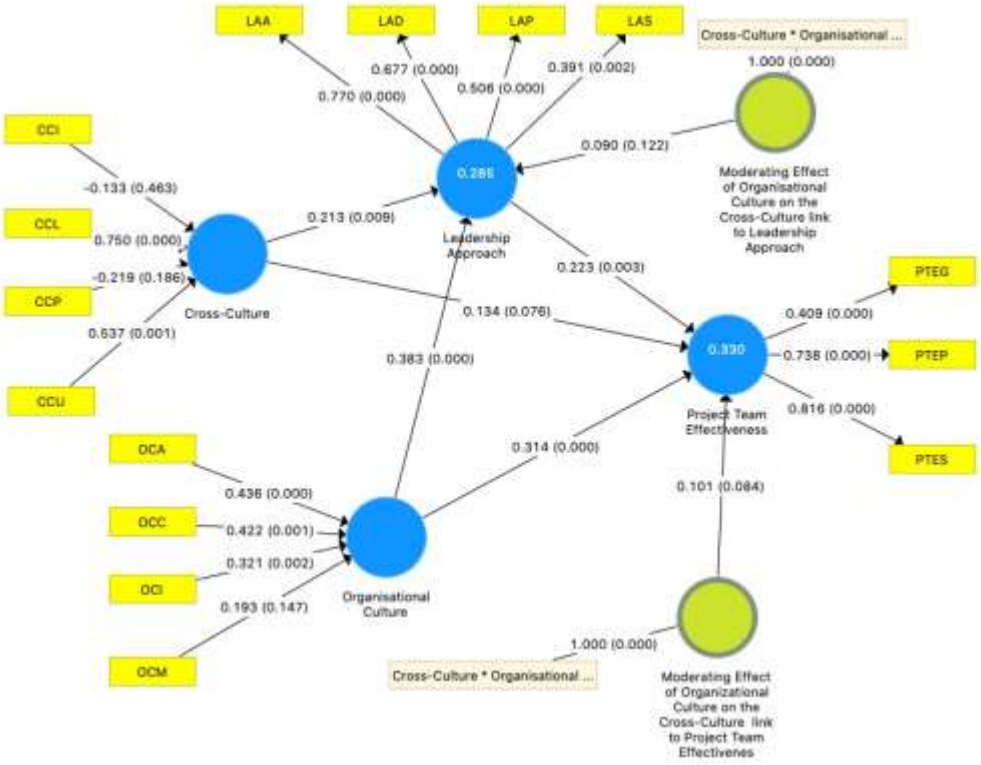
From an ontological perspective, it is important that the SEM constructs represent the reality defined by the interacting concepts. This is achieved by validating the measurement models and fitting the structural model (Edwards et al., 2012). First, the reflective and formative measurement models are assessed independently using different sets of evaluation techniques, because the assessment criteria for formative and reflective models are different (Hair et al., 2017). This is principally based on some established rules of thumb, which are broad guidelines provided in the literature (Hair et al., 2017, 2020; Sarstedt et al., 2020). However, the use of these guidelines is based on the unique specificness of the study. To rule out the possibility of obtaining the study results by "chance," the *p*-value and *t*-value have been adopted as two approaches for the determination of statistical significance.

In behavioural sciences, the probability (*p*) of the sample result is compared with a set alpha level to determine the significance of the outcome and if the null hypothesis is true (Cohen et al., 2003). For this research, the test hypothesis *p*-values have been defined as follows: $p \leq 0.01$ (statistically highly significant), $p \leq 0.05$ (statistically significant); and $p \leq 0.1$ (significant). The adoption of $p \leq 0.1$ as a significance level is based on the exploratory nature of this work as suggested in the literature (David, 2016). Again, a prediction is accepted as statistically significant if the t-value is above the critical value of 1.690 ($t_{,!} \geq 1.690$), where $\alpha = 0.05$. The *t*-value was adopted as a complementary significance check criterion, which measures the deviation of the mean of the alternative hypothesis from "0' in units of the standard error. Thus, the lower the standard error, the more of the sampled data fitting the causal link regression line and the higher the t-value. The combined criterion for rejecting the null hypothesis is discussed in the section on hypotheses testing, hereafter.

The outcome of the SEM simulation for the study is presented Figure 4.2, below. From the results, the R-squared value for the project team effectiveness (R^2=0.33, *p*=0.000), which is the main outcome of the investigation, is greater than the theoretical R-squared (R^2=0.25) used in the determination of the sample size in chapter 3, hence the model has achieved statistical significance. Also, the prediction of the operational leadership behaviour (R^2=0.29) is also above the set threshold value of R^2=0.25. During the presentation of the hypotheses testing, the implication(s) of the outcome of this thesis in project management was discussed.

Figure 4.2

Structural Equation Model Results



As implied in Figure 4.2, the correlations of the latent variables are statistically significant because the *p*-values are less than the set alpha level of 0.05 discussed earlier. The direction and strength of the sause-effect relationship between pairs of the latent variables is in Table 4.1.

Table 4.1

Correlation of Latent Variables

Latent Variable Correlations (Pearson's r)	Original Sample (x)	Sample Mean ( )	Standard Deviation (SD)	T Statistics (|x/SD|)	Confidence Intervals Bias Corrected		P Values	Significance Level
					2.5%	97.5%		
Leadership Approach -> Cross-Culture	0.37	0.37	0.11	3.49	-0.29	0.47	0.00	Statistically Highly Significant
Organisational Culture -> Cross-Culture	0.39	0.38	0.12	3.35	0.22	0.52	0.00	Statistically Highly Significant
Organisational Culture -> Leadership Approach	0.49	0.50	0.06	8.21	0.34	0.58	0.00	Statistically Highly Significant
Project Team Effectiveness -> Cross-Culture	0.35	0.35	0.11	3.20	-0.36	0.45	0.00	Statistically Highly Significant
Project Team Effectiveness -> Leadership Approach	0.45	0.46	0.06	6.96	0.30	0.55	0.00	Statistically Highly Significant
Project Team Effectiveness -> Organisational Culture	0.50	0.51	0.06	8.84	0.37	0.60	0.00	Statistically Highly Significant

The correlation study in Table 4.1, suggests that the direction of the linear relationships between the pairs is positive, statistically highly significant as defined earlier, and the strength ranges from 0.37 to 0.50. Higher correlation values were obtained for the paired relationships involving organizational culture and leadership, and organizational culture and team effectiveness, suggesting a higher influencing control of organizational culture in projects. However, details of the implications of the findings will be provided later. The statistical significance of the outcomes in Table 4.1, is an indication that the SEM passed credibility test using the *p*-value.

Assessing the Reflective Measurement Models

The two reflective models are leadership approach and project team effectiveness. They are measured as reflective because the leadership approach determines the most appropriate leadership behaviour in a given project context, and the effectiveness of the team determines the loadings for each related dimension of team effectiveness. The assessment metrics adopted in this section include the outer loadings for each concept, discriminant validity, internal consistency convergent validity, and reliability, as discussed in (Hair et al., 2019).

Outer Loadings

The confidence interval bias corrected and accelerated (BCa) bootstrapping approach corrects for bias and skewness in the bootstrapping estimate. The approach was implemented for 1000 subsamples to determine the significance level at two-tailed alpha level of 0.05 (95% CI). The outer loadings are expected to provide acceptable item reliability by accounting for > 50 per cent of the variance of the indicator. Hence, a value of 0.708 is usually recommended (Hair et al., 2019). From Table 4.2, the outer loadings that achieved the set criteria above are as follows: achievement-oriented leadership (LAA: 0.770), productive output (PTEP: 0.738) and socialising process (PTES: 0.816). However, the other loadings with values less than 0.708 are equally accepted because they are also highly significant with $p<0.01$ and fulfil the research purpose, which is to rank the loadings in the order of their effect on achieving project success.

Table 4.2

Outer Loadings for Reflective Models

Outer Loadings	Original Sample (x)	Sample Mean ( )	Standard Deviation (SD)	T Statistics (|x/SD|)	Confidence Intervals Bias Corrected		P Values	Significance Level
					2.5%	97.5%		
LAA <- Leadership Approach	0.77	0.77	0.05	14.60	0.66	0.86	0.00	Statistically Highly Significant
LAD <- Leadership Approach	0.68	0.67	0.07	9.76	0.52	0.78	0.00	Statistically Highly Significant
LAP <- Leadership Approach	0.51	0.50	0.10	4.89	0.26	0.66	0.00	Statistically Highly Significant
LAS <- Leadership Approach	0.39	0.38	0.13	3.10	0.11	0.60	0.00	Statistically Highly Significant
PTEG <- Project Team Effectiveness	0.41	0.41	0.12	3.46	0.13	0.60	0.00	Statistically Highly Significant
PTEP <- Project Team Effectiveness	0.74	0.73	0.06	12.52	0.59	0.83	0.00	Statistically Highly Significant
PTES <- Project Team Effectiveness	0.82	0.81	0.06	14.24	0.68	0.90	0.00	Statistically Highly Significant

As shown in Table 4.2, except for supportive leadership (LAS) and group experience (PTEG), the other outer loadings for the reflective models are >0.5. All the bootstrapping confidence interval reported are bias-corrected.

Consistency Reliability

The next assessment that was performed on the data sets is the internal consistency reliability which was achieved using composite reliability check. The composite reliability was developed by Jöreskog (1971), and it is used most often because it produces higher values than Cronbach's alpha (Hair et al., 2019), and ideal for exploratory studies. In exploratory studies, reliability scores ranging from 0.6 to 0.7 are considered acceptable (Hair et al., 2019). Table 4.3 presents the composite reliability values for both the original sample and the 1000 bootstrapping subsamples. The values of reliability are highly significant (P<0.01) at 0.68 for leadership approach and 0.70 for project team effectiveness, which indicates that the reflective measurement models are reliable.

Table 4.3

Composite Reliability

Composite Reliability	Original Sample (x)	Sample Mean ( )	Standard Deviation (SD)	T Statistics (|x/SD|)	Confidence Intervals Bias Corrected		P Values	Significance Level
					2.5%	97.5%		
Leadership Approach	0.68	0.68	0.04	19.07	0.60	0.740	0.000	Statistically Highly Significant
Project Team Effectiveness	0.70	0.70	0.04	19.06	0.61	0.758	0.000	Statistically Highly Significant

As also seen from the Table 4.3, the lower and higher band values at the confidence interval aligns with the set criteria above, with the higher bound (97.5%) slightly above the recommended acceptable maximum reliability check for exploratory studies.

Convergent Validity

"Convergent validity is the extent to which the construct converges to explain the variance of its items" (Hair et al., 2019, p. 9). This criterion is evaluated from the average variance extracted (AVE) of the measured indicators on each construct. It is computed from the mean value of the

square of each loading on the construct. The minimum acceptable value of AVE is 0.5, indicating that more than 50 per cent of the variance of its loadings was explained by the cnstruct. Table 4.4 present the AVE for the reflective constructs and the 95% confidence interval at 1000 subsample bootstrapping. When approximated to a single digit decimal place, the results indicates that the values for leadership approach (0.4) is less than 0.5, and project team effectiveness is 0.5 which meets the minimum AVE criteria. However, the 0.4 value for leadership approach is still acceptable, because the composite reliability for leadership approach (0.68) and project team effectiveness (0.70) are higher than 0.6. Fornell and Larcker (1981) suggest that the convergence validity of the concept may be satisfactory if the average variance extracted (AVE) is below 0.5, provided that the composite reliability exceeds 0.6.

Table 4.4

Average Variance Extracted (AVE)

Average Variance Extracted (AVE)	Original Sample (x)	Sample Mean ( )	Standard Deviation (SD)	T Statistics (|x/SD|)	Confidence Intervals Bias Corrected 2.5%	97.5%	P Values	Significance Level
Leadership Approach	0.37	0.37	0.03	14.35	0.32	0.415	0.000	Statistically Highly Significant
Project Team Effectiveness	0.46	0.46	0.03	14.54	0.40	0.520	0.000	Statistically Highly Significant

Finally, on the assessment of the reflective measure models the discriminant validity will be discussed next.

Discriminant Validity

This metric explains how distinctly a construct stands apart from other constructs within the structural model, based on empirical evidence. As suggested in the literature (Fornell & Larcker, 1981), the discriminant validity of a reflective measurement model can be assessed from the difference between the square of their inter-construct correlation and their respective AVE.

Based on this metric, the model is valid if the squared inter-construct corelation is less than their respective AVE. For this study, the inter-construct correlation value between leadership approach and project team effectiveness is 0.45. The square of this value is 0.20. This value is less than the AVE for leadership approach (0.37) and project team effectiveness (0.46), hence the model is valid. However, this approach is not suitable when the loadings in each construct differ only slightly because of low sensitivity to discovering discriminant validity issues in this kind of constructs (Henseler et al., 2015), which is not the case in this research because the range of the indicator loadings differ greatly: 0.391- 0.770 for leadership approach and 0.409 - 0.816 for project team effectiveness.

Henseler et al. (2015) suggests that a more recommended metric for discussing discriminant validity is the Heterotrait Monotrait ratio (HTMT). This metric is a ratio of correlations, calculated by comparing the mean item correlations across constructs to the geometric mean of the item correlations within the same construct (Hair et al., 2019, p. 9). Henseler et al. (2015) propose that issues with discriminant validity are unlikely if HTMT values remain below 0.9. However, values exceeding this threshold may still be acceptable if the constructs share conceptual similarities, as demonstrated in this study where both leadership approach and project team effectiveness are influenced by organizational culture. For this research, the simulated HTMT value is presented in Table 4.5.

Table 4.5

Heterotrait Monotrait ratio

Heterotrait-Monotrait Ratio (HTMT)	**Original Sample (x)**	**Sample Mean ($\bar{x}$)**	**Confidence Intervals Bias Corrected**	
			2.5%	**97.5%**
Project Team Effectiveness -> Leadership Approach	0.97	1.01	0.69	1.253

The lower band of the confidence interval (CI) is less than the set criteria above, and the upper band value of 1.253 is higher than the set value of 0.9, showing that at the higher CI level, the constructs measure the same project performance-related phenomenon.

Conclusions on Reflective Measurement Models

The above assessments indicate that the reflective measurement models are valid and well suited for the current study. Table 4.6 summarises the reliability check results for reflective models.

Table 4.6

Summary of Reflective Models Validity Checks

Reflective Model	Composite Reliability		Heterotrait-Monotrait ratio (HTMT)		Conclusion
	Criteria	Models	Criteria	Models	
Leadership Approach Project Team Effectiveness	0.6-0.7 (for exploratory studies)	0.68 0.7	>0.9 (when **constructs** are conceptually similar	0.97	Models **are** valid and indicators accepted

Cronbach alpha reliability criteria returned 0.42 for both reflective models. Despite these unacceptable Cronbach alpha values, the indicators were still retained because they are validated theoretical measures and have not been developed to be used as confirmatory factors. Their use in this thesis is based on the need to rank their presence in project activities in the oil and gas industry. Therefore, the more generous composite reliability check metric was used instead, and the model passed the validity test. The AVE estimated from the model was lower by 0.13 for leadership approach and 0.04 for project team effectiveness, based on a minimum value of 0.5. However, the AVE estimates did not affect the acceptance of the models because of the support from the

literature that since the composite reliability value was more than 0.6, the models are valid. Another support for the validity of both models was the estimated HTMT value which met the accepted criteria in the literature for constructs that a similar in concept. Next, is to assess the validity of the formative measurement models, which include cross-culture and organizational culture.

Assessing the Formative Measurement Models

The two formative models are cross-culture and organizational culture. The indicators used in this investigation are considered formative because they are believed to shape and determine the dominant cross-culture and organizational culture beliefs and assumptions within the project team. It is assumed that these measured indicators directly influence the observable norms and behaviors exhibited by the team. By understanding and measuring these indicators, it is possible to can gain insights into the underlying cultural influences that impact the team's dynamics and functioning. This assessment includes indicator collinearity, statistical significance, and indicator weights' relevance as explained in (Hair et al., 2019).

Indicator Collinearity

This assessment is conducted using the variance inflator factor (VIF) metric provided in Table 4.7. VIF values of 5 or above indicate the presence of critical collinearity among the indicators, implying that the indicators are empirically the same. To avoid collinearity issues, the VIF for the constructs must be lower than 3 (Hair et al., 2019). The VIF results in Table 4.7 illustrate that all the VIF values are < 3, thus fulfilling the criteria that rules out collinearity issues stated earlier. The next and final test for the formative measuring models is to check if the indicator weights are significant and relevant to the study

Table 4.7

Collinearity Check

Latent Construct	Indicators	VIF
Cross-Culture	**CCI**	1.149
	CCL	1.039
	CCP	1.135
	CCU	1.013
Moderation 1 (on Leadership Approach)	**Cross-Culture * Organisational Culture**	1.000
Moderation 2 (on Project Team Effectiveness)	**Cross-Culture * Organisational Culture**	1.000
Organizational Culture	**OCA**	1.306
	OCC	1.307
	OCI	1.303
	OCM	1.398

Statistical Significance and Indicator Weight's Relevance

The indicators in this research are based on the validated measurement dimensions of theories of CCD and OC. The purpose of this work is to ascertain the order of relevance of each indicator to the relationships established between the formative and the reflective constructs. Therefore, the simulated weight of each indicator is necessary to establish the position that this investigation pursues. Significance tests are conducted to examine the discrepancy between the data and the null hypothesis, to guide in decision-making as revealed from the field survey data. The criterion for including an indicator is established by the significant loading of 0.5 or above (Hair et al., 2019). However, the formative measurement indicators are theoretically relevant to the constructs and have been included to fully capture the entire horizon of influence in the conceptual framework for this research.

The research assumed that weights are not a concern if they are statistically significant at $p<0.05$ ($\alpha = 0.05$), and the loadings are also significant (Hair et al., 2017), because the intent in the investigation is to use the weights/loadings as criteria for judging the effect of each indicator

on the outcome of the study. To determine the statistical significance of the outer weight of each indicator in PLS-SEM, bootstrapping is employed because PLS-SEM is a nonparametric statistical analysis method and it is important to correct for bias and skewness in the normal probability curve. The results reported below (Table 4.8) are those for 1000 bootstrapping subsamples, as resampling with replacement at 100 and 500 subsamples equally indicated similar *p*-values.

Table 4.8

Standardized Indicator's Outer Weights

Outer Weights	Original Sample (x)	Sample Mean ( )	Standard Deviation (SD)	T Statistics (|x/SD|)	Confidence Intervals Bias Corrected 2.5%	Confidence Intervals Bias Corrected 97.5%	P Values	Significance Level
CCI -> Cross-Culture	-0.13	-0.13	0.18	0.74	-0.46	0.25	0.46	Not Significant
CCL -> Cross-Culture	0.75	0.71	0.19	3.90	0.51	0.94	0.00	Statistically Highly Significant
CCP -> Cross-Culture	-0.22	-0.19	0.17	1.29	-0.52	0.11	0.20	Not Significant
CCU -> Cross-Culture	0.54	0.50	0.17	3.20	0.27	0.79	0.00	Statistically Highly Significant
OCA -> Organisational Culture	0.44	0.43	0.11	3.97	0.21	0.65	0.00	Statistically Highly Significant
OCC -> Organisational Culture	0.42	0.41	0.13	3.36	0.18	0.67	0.00	Statistically Highly Significant
OCI -> Organisational Culture	0.32	0.32	0.10	3.25	0.11	0.50	0.00	Statistically Highly Significant
OCM -> Organisational Culture	0.19	0.20	0.13	1.47	-0.07	0.43	0.14	Not Significant

From Table 4.8 above, three of the indicators were non-statistically significant at $p<0.05$. These include two indicators of cross-culture: individualism-collectivism ($p=0.461$) and power-distance ($p=0.197$); and one indicator of organizational culture: mission ($p=0.142$). These *p*-values will now be compared with their corresponding *p*-values in the table for outer loadings for each indicator, as below (Table 4.9). The aim of extracting the outer loadings was to check if changing the status of each formative model to reflective model will change the significance of the measured variables. The result suggest that the significance outcome improved, although still > 0.05 at $\alpha =$ 0.05 for cross-culture: individualism-collectivism ($p=0.14$) and power-distance ($p=0.1$).

Table 4.9

Outer Loadings of Formative Models

Outer Loadings	Original Sample (x)	Sample Mean ( )	Standard Deviation (SD)	T Statistics (|x/SD|)	Confidence Intervals Bias Corrected 2.5%	Confidence Intervals Bias Corrected 97.5%	P Values	Significance Level
			0.21	1.49	-0.64	0.13	0.14	Not Significant
CCI -> Cross-Culture	-0.31	-0.29						
CCL -> Cross-Culture	0.81	0.77	0.20	4.02	0.63	0.96	0.00	Statistically Highly Significant
CCP -> Cross-Culture	-0.30	-0.27	0.18	1.67	-0.57	0.01	0.10	Not Significant
CCU -> Cross-Culture	0.53	0.49	0.17	3.11	0.22	0.78	0.00	Statistically Highly Significant
OCA -> Organisational Culture	0.75	0.74	0.08	9.65	0.59	0.88	0.00	Statistically Highly Significant
OCC -> Organisational Culture	0.76	0.75	0.07	10.17	0.61	0.90	0.00	Statistically Highly Significant
OCI -> Organisational Culture	0.70	0.69	0.07	9.89	0.56	0.83	0.00	Statistically Highly Significant
OCM -> Organisational Culture	0.66	0.65	0.10	6.78	0.44	0.82	0.00	Statistically Highly Significant

The relevance of the indicators is examined by standardization of the indicator weights as shown in Table 4.10, below.

Table 4.10

Standardization of Formative Indicator Weights

Standardized Outer Model Weights	Cross-Culture	Leadership Approach	Moderating Effect of OC on PGL mediation	Moderating Effect of OC on the CC link to PTE	Organisational Culture	Project Team Effectiveness
CCI	1					
CCL	1					
CCP	1					
CCU	1					
Cross-Culture * Organisational Culture				1		
Cross-Culture * Organisational Culture			1			
LAA		-1				
LAD		-1				
LAP		-1				
LAS		-1				
OCA					1	
OCC					1	
OCI					1	
OCM					1	
PTEG						-1
PTEP						-1
PTES						-1

Also, the only non-significant indicator in organizational culture in the formative model was now statistically highly significant (p = 0.000) in a reflective model scenario. However, the study retained the earlier *status quo*, that defines cultural concepts in this research as formative in nature and the need to rank their level of influence on project dynamics. This was aimed at stressing that cultural variables are predicted by the measured outcomes.

Finally, the use of *p*-value and confidence interval (CI) is dependent on the importance of the indicator to the study from both theoretical, experimental and practical aspect (Ganesh & Cave, 2018). The values of -1 (reflective) or +1 (formative) indicates strong relationships (Hair et al., 2019).

Conclusions on Formative Measurement Models

The analysis conducted on the formative measurement models are summarised in Table 4.11, below. The formative indicators have been retained on theoretical basis, and the purpose of the models have been fulfilled as able to indicate the cross-cultural and organizational culture dynamics during the execution stage in projects. The analysis set forth can aid in project audits to understand how the ranking of the influence of the measured variables determine the people-factored dynamics within a project environment.

Table 4.11

Summary of Formative Models Validity Checks

Formative Model -	Indicator Collinearity (VIF Criteria)		Standardization of Outer Weights		Conclusion
	Criteria	Models	Criteria	Models	
Cross-Culture Organizational Culture	< 3	Max: 1.149 Max: 1.398	+1 for formative models	+1	Models are valid and indicators accepted

As seen above, the VIFs are less that 3, and the standardized outer weights for all formative indicators are "+1." Both criteria have been fulfilled as outlined in the literature. Therefore, the formative models are valid for the SEM developed in this research. Now that both reflective and formative models are validated, the final validity and relatability assessment is for the entire SEM and this will be discussed next.

Assessing the Structural Equation Model

Given the satisfactory evaluations of both reflective and formative measurement models, it is crucial to evaluate the developed structural model, as advocated in several PLS-SEM documentations (Hair et al., 2019). Standard assessment criteria include the R-squared, along with the statistical significance and relevance of the path coefficients. Additionally, the collinearity assessment confirms unbiased regression results, as no collinearity issues were detected.

The coefficient of determination (R^2)

The R-squared (R^2) value, as (Rigdon, 2012) ascertained, demonstrates the predictive capacity of the research sample data. Cohen (1988) explains that R^2 illustrates how much of the variance in the output variable the input variable explains in a predictive causal model. R^2 takes numerical values from 0 to 1, with higher scores indicating more significant explanatory capability As per literature guidelines, Hair et al. (2011, 2019) classify R^2 values of 0.75, 0.50, and 0.25 as substantial, moderate, and weak, respectively, signifying the level of explanatory strength. The outcome of this criterion is provided in Table 4.12, below.

Table 4.12

Coefficient of Determination (R-Squared)

Predicted Research Outcome	Original Sample		Confidence Intervals Bias with Corrected (R-Suqared)		Confidence Intervals Bias with Corrected (R-Squared-Adjusted)		P-Value		Significance
	R-Squared	R-Squared Adjusted	2.5%	97.5%	2.5%	97.5%	R-Squared	R-Squared Adjusted	
Leadership Approach	0.29	0.27	0.15	0.374	0.14	0.365	0.000	0.000	Statistically Highly Significant
Project Team Effectiveness	0.33	0.32	0.21	0.424	0.19	0.412	0.000	0.000	Statistically Highly Significant

The explanatory power of the SEM lies between “weak” and “moderate” based on the classification discussed earlier, and they are statistically significant for the output latent variables: leadership approach and project team effectiveness. The adjusted value recognises the effect of multiple inputs in predicting the R^2 for both variables. The R^2 for leadership approach is predicted by both cross-culture and organizational culture, while the R^2 for project team effectiveness is predicted by cross-culture, organizational culture, and leadership approach. Implying that 27% of the variance of leadership approach is attributed to variance in cross-culture and organizational culture.

Similarly, the 32% of the variance of project team effectiveness is attributed to the variance predicted by cross-culture, organizational culture, and leadership approach. These values are substantial from the perspective of project delays and cost overrun. In predicting stock returns, an R^2 value of 0.10 is considered satisfactory (Raithel et al., 2012). Thus, the R^2 values obtained are satisfactory as they demonstrate that the model is capable of proactive predictive tool to inform organizational management team of possible issues affecting the productivity of project teams from perspective of the correlation between the varaibles. Project delays are costly and with the volatility in the oil and gas industry, delays can lead to reputation issues, and negative effect on the energy market. Equally, the model developed in this research can rank the indicators based on the loadings and weights, thus fulfilling the need and context of the research.

Statistical Significance and Relevance of the Path Coefficients

In Table 4.13, the direct effects are all statistically significant at $t_{,!} \geq 1.690$, except for the OC moderation on the CC link to leadership. The path coefficients were achieved using a bootstrapping simulation of 1000 subsamples. Thus, the analysis is fit for a large sample with similar results.

Table 4.13

Path Coefficients of Latent Variables

Path Coefficients	Original Sample (x)	Sample Mean ( )	Standard Deviation (SD)	T Statistics (|x/SD|)	Confidence Intervals Bias Corrected		P Values	Significance
					2.5%	97.5%		
Cross-Culture -> Leadership Approach	0.21	0.21	0.08	2.56	0.03	0.34	0.01	Statistically Significant
Cross-Culture -> Project Team Effectiveness	0.13	0.14	0.08	1.77	-0.12	0.25	0.08	Significant
Leadership Approach -> Project Team Effectiveness	0.22	0.22	0.08	2.91	0.06	0.37	0.00	Statistically Highly Significant
Moderating Effect of OC on CC -> Leadership Approach	0.09	0.08	0.06	1.53	-0.02	0.21	0.13	Not Significant
Moderating Effect of OC on the CC -> Project Team Effectiveness	0.10	0.10	0.06	1.76	-0.02	0.20	0.08	Significant
Organisational Culture -> Leadership Approach	0.38	0.40	0.07	5.40	0.21	0.50	0.00	Statistically Highly Significant
Organisational Culture -> Project Team Effectiveness	0.31	0.31	0.07	4.20	0.15	0.45	0.00	Statistically Highly Significant

Conclusions on Structural Model Assessment

The use of fit indices for PLS-SEM is still on the formative stage, especially for models that incorporates both formative and reflective measurement models. The R-squared values of the regression estimates are statistically significant and greater than the theoretical value of 0.25 used in estimating the sample size in chapter 3. All the latent variables correlations in the final SEM are statistically and highly significant at $p \leq 0.01$. In Figure 4.2, except for the moderation effect of the direct consequence of the relationship between cross-culture and leadership with a *p-value* of 0.13, the path coefficients are statistically significant at $p \leq 0.01$ and significant at $p \leq 0.10$ ($t_{,!} \geq 1.690$) for organizational culture moderation effect of the connection between CCD and

PTE. The basis of this investigation was to develop a model that can offer insight into problems affecting project success and delivery from the perspective of cross-culture when the leadership approach and project team norms are strongly dependent on the organizational culture. Thus, the outcome of the validity assessment conducted so far suggests that the model developed is fit for purpose.

Results and Discussion

This section is devoted to results and data analysis. A section on hypothesis testing will be provided afterwards. The essence is to provide further insights into the factors influencing team effectiveness in projects, especially in the industry. Descriptive statistics were performed to elucidate the average, median, standard deviation, and correlation among the measured variables. Another correlation matrix will assess the relationship between the latent variables. Earlier, the SEM was evaluated for validity through the assessments of the structural, reflective measurement model and formative measurement models.

The simulations were run on the PLS algorithm at 1000 iterations with a stop criterion of 1E-10. A bootstrapping technique was adopted by generating 10000 subsamples. Bootstrapping was conducted as the path coefficients in PLS are nonparametric, hence the usual asymptotic significance levels cannot be computed directly, except by bootstrapping technique. The results of the SEM have been presented during the validity and reliability assessments. These results will be used to test the hypotheses. To determine the strength of the variables influencing the project environment, the pairs of correlation variables were mapped using a technique developed and unique to this research in Figure 4.11. Further investigation was conducted using network analysis where the strength of correlation defines the project's controlling variables at the core of the network. These two techniques were adopted to guide further validation of the outcome of the

SEM. This research incorporated four latent variables: cross-culture, leadership approach, organizational culture, and project team effectiveness.

Cross-Culture: This concept is the main predictor variable in the study. Culture is defined as "the collective programming of the mind that distinguishes the members of one group or category of people from others" (Hofstede, 2011, p. 3). This concept explains how people from different cultural beliefs and assumptions interact to create a team culture. This team culture is moderated by the OC to ensure that the norms that defines the expected behaviour in the team is controlled by organizational policies.

Leadership Approach: Every organization is led by a team of leaders, referred to as the leadership. Leadership "is a major force that influences goals, the amount of involvement with and commitment to productivity, the amount of creativity in solving problems, and the degree of satisfaction from work" (Blake & Mouton 1981, p.440). As a mediating concept, the regressed effect of CCD on PTE is reduced by the presence of leadership.

Project Team Effectiveness: This concept have been defined from the perspective of group experience, socializing process and productive output (Wageman et al., 2005). Accordingly, the literature explained team effectiveness as the team's output consistently meeting specified quality, quantity, and timeliness; socialising among team members enhancing their capability to work together interdependently with minimal supervision; and team interaction. Sine effectiveness criteria in organizational setting are difficult to measure (Hackman, 2002), this research questionnaire relied on asking straightforward questions based on the three criteria discussed here.

Organizational Culture: This is defined " as the accumulated shared learning of a given group, covering behavioural, emotional, and cognitive elements of the group members' total

psychological functioning" (Schein, 2004, p. 17). As a moderator in this construct, it implies that the relationship between LA, CCD and PTE depends on OC.

Descriptive Statistics

The measured variables are the dimensions of the latent variables discussed above. Fifteen (15) variables were measured all together. The purpose of this section to obtain basic descriptive statistics of the dataset using measure of central tendency. However, when data are measured on an interval or ratio scale, the mean remains the favoured method of describing central tendency (Mertler & Reinhart, 2016). Hence, the mean will form the basis for the analysis of the data sets, including the standard deviation of the measures from the mean. This approach will be used to provide a preliminary ranking of the dimensions that influence the project environment.

Description of Retrieved Data

Out of the 230 questionnaires distributed, a data collection survey garnered a response rate of 91%, as 210 questionnaires were returned. These 210 surveys exhibited complete responses across all sections and did not contain any outlier data. Thus, the response was more than the calculated sample size and suitable for the study. While demographic details of the participants were collected, they are not the primary criteria required for developing the leadership model. The age band of participants are as follows: 30-35(56), 36-40(106), 41-45(12), 46-50(25) and above 50(11), given an average team age band of 36-40. The participants are all Nigerians comprised of 31 females (15%) while 179 were males (85%). Educational level of the participants is as follows: Diploma (4), Degree/HND (201), Master (3) and Doctorate (2), suggesting a highly educated team. Despite having 11 years of project experience in the industry, no personal interference was involved in the study's outcome. This decision was made to ensure and maintain objectivity

throughout the research process. The entire study is guided by the Unicaf University in Zambia ethical guidelines and codes of conduct.

The Unicaf University in Zambia Research Ethics Committee (UREC) approval to conduct the survey was received on the 8th of August 2022. Data collection commenced immediately and was completed on the 20th of September 2022. The study holds significance as it contributes to the improvement of existing knowledge regarding project team leadership. By adopting a cross-cultural perspective, it offers further iinsights into relevant elements with the potential to enhance project performance and improve team effectiveness specifically within the study industry. Through an examination of these factors, the study aims to shed light on how leadership practices can be optimized to maximize project outcomes in this particular context.

By doing so, the study fills a critical gap in understanding effective leadership practices within this industry and provide practical recommendations that can be utilized by professionals and organizations operating in similar contexts. Ultimately, the findings can contribute to the development of more effective leadership approaches, promote project success, and drive positive impacts in the Nigerian oil and gas industry. In the following section, we will explore latent and measured variables, and their significance in the study's framework will be explained.

Measure of Central Tendency and Variability

When data are measured on an interval or ratio scale, the mean remains the favoured method of describing central tendency (Mertler & Reinhart, 2016). This statistical method allows for meaningful comparisons and enables further calculations, such as variance and standard deviation. While other measures like the median and mode have their merits, the mean's ability to capture the overall average makes it a widely utilized tool in statistical analysis, aiding in

understanding and summarizing data on such scales. Table 4.14 provides the results of the descriptive statistics based on the data retired from the survey.

Table 4.14

Descriptive Statistics

Descriptive Statistics	CCP	CCU	CCI	CCL	LAD	LAS	LAP	LAA	PTEP	PTES	PTEG	OCM	OCA	OCI	OCC
Valid	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210
Mean	3.80	3.74	3.05	3.79	3.71	4.02	4.51	4.19	3.80	3.09	3.93	4.10	3.71	3.57	3.94
Std. Error of Mean	0.07	0.08	0.07	0.06	0.06	0.05	0.04	0.05	0.06	0.05	0.06	0.05	0.06	0.07	0.06
Std. Deviation	0.96	1.12	1.02	0.81	0.80	0.68	0.63	0.73	0.85	0.75	0.92	0.77	0.84	0.96	0.90
Shapiro-Wilk	0.88	0.86	0.90	0.86	0.85	0.80	0.70	0.81	0.86	0.82	0.85	0.82	0.86	0.89	0.85
P-value of Shapiro-Wilk	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001
Minimum	1	1	1	2	2	3	2	2	1	1	1	2	2	1	2
Maximum	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5

The criteria for inference are defined as follows: Mean values greater than 2.5 are considered high, except for individualism-collectivism and Short/Long-term orientation, where a mean greater than 2.5 indicates collectivism and long-term orientation, respectively. The Shapiro-Wilk test, as shown in Table 4.14, indicates a departure from normality in the measured variables. This is evident because all the *p*-values associated with the test are less than 0.05. The *p*-value represents the probability of observing the obtained data, or more extreme data, assuming that the variables follow a normal distribution (Goss-Sampson, 2022). When the *p*-value is less than 0.05, it suggests that the observed data is significantly different from a normal distribution. Therefore, based on the Shapiro-Wilk test results, we can conclude that the measured variables do not conform to a normal distribution. This is why the data set can be simulated using PLS-SEM technique as discussed in chapter 3. By utilizing PLS-SEM, this investigation can accurately model the relationships between variables and obtain reliable results despite the lack of normal distribution in the dataset. The maximum standard error (SE) occurred at the maximum standard deviation of 1.12 (CCU), given a value of 0.08. This low variation of the sample mean from the population

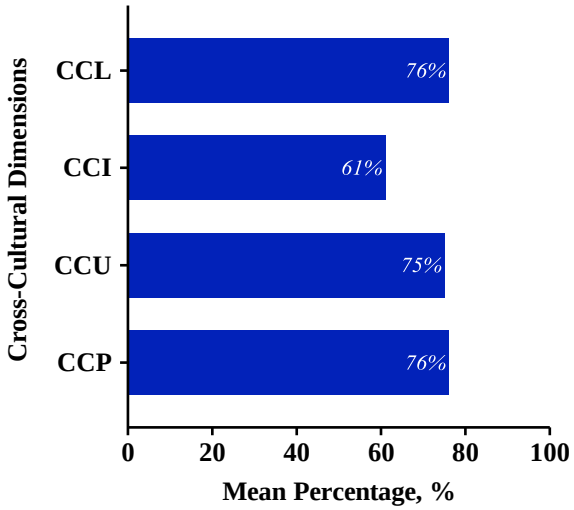
mean shows that applying bootstrapping technique on different subsamples higher than the data size will return similar results. The descriptive statistics results for each measured variable will be discussed further.

Cross-Culture

The measured indicators of cross-culture (CCP, CCU, CCI and CCL) are shown in Table 4.14. Mean measure for all indicators exceeds 2.5, revealing significant power distance, strong collectivism, uncertainty avoidance, and long-term orientation. Power distance refers to the extent to which individuals accept and expect power inequalities within a society or organization. A higher mean value above 2.5 suggests a considerable power distance, indicating that individuals within the setting are likely to accept and expect hierarchical structures and authority. Uncertainty avoidance relates to the willingness of team members to tolerate ambiguity, uncertainty, and risk. With a mean measure surpassing 2.5, it indicates a high level of uncertainty avoidance, suggesting that individuals in the studied context tend to exhibit a strong preference for stability, structure, and rules to minimize uncertainty. Collectivism refers to the degree to which individuals prioritize the interests of their group or community over their individual desires. The mean value exceeding 2.5 suggests a significant presence of collectivism, indicating that individuals in the team tend to prioritize group goals and values over their personal aspirations. Long-term orientation reflects a society's focus on future-oriented planning, persistence, and adherence to traditions. The mean value above 2.5 implies a notable long-term orientation, suggesting that individuals within the project teams exhibit a strong inclination towards planning for the future and valuing traditions and perseverance. Figure 4.3 shows the mean as a percentage of the maximum scale in the measurement tool. Details of each measure will be discussed further.

Figure 4.3

Percentage Mean Values of Cross-Cultural Dimensions



Power Distance (CCP)

As explained earlier, power distance determines the extent to which members of a team are part of the decision-making process. In Table 4.14, power distance (CCP) had a mean and standard deviation of 3.80±0.96. The lower (2.84) and upper (4.76) bounds are above the average of 2.5 for the scale of 1 to 5 used in the survey tool. The question relating to power-distance in the survey instrument was for the participants to indicate the "*existence of inequality from top to bottom of the leadership hierarchy.*" Hence, the measure was to determine the extent of agreement within the team that power is not equally distributed. A percentage mean of 76% implies that large power-distance is the locus of interaction in project teams in the industry. Consequently, a large power-distance imply that most decisions are made by the leadership. This is corroborated Hofstede's Insight website for Nigeria (Hofstede, n.d.), indicating a significant power distance between individuals and a hierarchical society. Respect for authority and seniority is crucial, and decision-making often rests with those in higher positions. The website provides an in-depth analysis of the

cultural dimensions of Nigeria, summarizing the key characteristics of the country's culture and societal norms. Nigeria is a diverse nation with over 250 ethnic groups, each contributing to its cultural fabric.

Uncertainty Avoidance (CCU)

This dimension indicates the readiness of team members to accept new roles as the project execution phase progresses. The question answered was "*there is consistent need for clarity roles and structure of the team*." The instrument returned a mean score of 3.74±1.12, implying a range of 2.62 to 4.86, and a mean percentage score of 75%. These results suggest that project team members are prepared for uncertainties (low uncertainty avoidance). Thus, corroborating the findings in Hofstede's Insight website, where uncertainty avoidance is moderate within the Nigerian cross-cultural context, suggesting a balance between accepting ambiguity and adhering to rules and regulations. While Nigerians generally seek stability and prefer structured environments, they also display adaptability and flexibility.This is important because projects are accompanied by changes and team members must be prepared to adapt to changes in their roles and team structure as dictated by project needs.

Individualism versus Collectivism (CCI)

This cross-culture indicator collects responses to determine the "*existence of in-group and out-group, and if relationship prevails over task*." A score above 2.5 indicates a collectivist culture, and individualistic if the score is below 2.5. The instrument returned a mean score of 3.05±1.02, implying a range of 2.03 to 4.07, and a mean percentage score of 61%. The score suggests the presence of moderate collectivist culture, as 39% of the responses favoured individualism. The collectivist culture is corroborated for Nigeria on the Hofstede's Insight website in the link provided earlier, emphasizing strong bonds within family and community units. Loyalty and group

harmony are highly valued, and individuals often prioritize the needs of the collective over their own. However, the presence of individualistic culture is not ruled out in project teams, because of the expert nature of some jobs requiring the individual to work independently most of the times, as professionalism is highly priced in projects (Atesmen, 2015). In addition, when project team size increases, the tendency of having multiple informal groups is high (Cobb, 2012), leading to the in-group and out-group phenomenon that was measured in the study. Hence, the above response of 39% individualism to 61% collectivism was anticipated.

Long-Term versus Short Term Orientation (CCL)

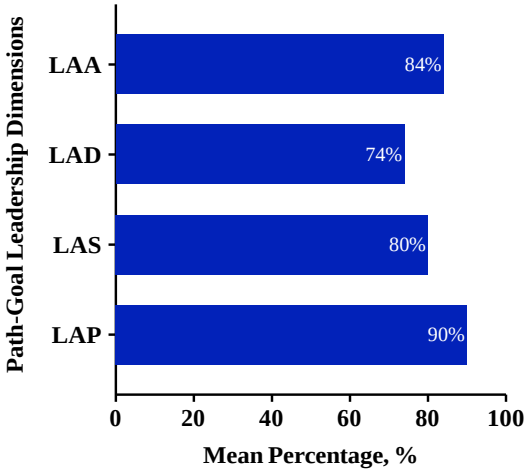
This dimension measures the propensity of saving for the future as reason for staying till the end of the project. The question asked here is expected to match the outcome of uncertainty avoidance, hence the question was stated as "*presence of high level of adaptation to change."* Those who adapt to change are equally prepared to accept uncertainties. Again, if the score is above 2.5 indicates a long-term orientation cross-culture is inferred, and short-term orientation cross-culture if the score is below 2.5. The instrument returned a mean score of 3.79±0.81, implying a range of 2.99 to 4.60, and a mean percentage score of 76%. This mean score suggests a long-term orientation culture in project teams in the industry of study. This outcome negates the expectation of the Nigerian context as reported on Hofstede's Insight website, with indulgence being relatively high, indicating a tendency towards enjoying life's pleasures and gratification. Nigerians embrace leisure activities, celebrations, and socializing, appreciating the richness of their cultural heritage. Hence, a high indulgence society will favour short-term orientation, with less emphasis on planning for the future. The presence of an adaptive culture in the project leads to a tendency for long-term planning based on enforced norms. Consequently, this concern will undergo further investigation to explore this phenomenon more comprehensively.

Leadership Approach

The leadership approach investigated are the domains of achievement-oriented, path-goal leadership: directive, participative, and supportive leadership styles. The percentage of the ratio of the mean score to the highest scale in the measurement tool is presented in Figure 4.4, below. Though the leadership styles are present in high rating, the order of practice is participative, achievement-oriented, supportive, and directive, with each style possessing distinct attributes. Hence, we see a project leadership and culture that emphasizes collaboration and inclusivity (participative); provides clear objectives, encourage innovation and excellence, and recognize and reward outstanding performance (achievement-oriented); creates a nurturing environment where individuals feel valued, cared for, and supported (supportive); and outlines project expectations, establish procedures, and closely supervise task execution (directive). This order will be re-evaluated later in the SEM analysis from the interaction of leadership and the other three concepts.

Figure 4.4

Percentage Mean Values of Path-Goal Leadership Dimensions



The implication of the results for each leadership style will be discussed below.

Directive Leadership (LAD)

Since project teams are specialised, the only characteristic of directive leadership will be in the form of standards and procedures that have been approved by the leadership. Hence, the question asked on the presence of directive leadership is related to the measurement of team performance and stated as, "*leadership explains the key performance indicators to subordinates."* The instrument returned a mean score of 3.71±0.80, implying a range of 2.92 to 4.51, and a mean percentage score of 74%. Directive leadership is the provision of the psychological structure aimed at reducing job complexity by clarifying the amount of work needed to receive a favourable appraisal. Later, by correlating directive leadership and long-term orientation, one can explain the relationship between clarifying project outcomes with the employee's desire to stay till the end of the project. Also, as will be shown later, directive leadership is significantly correlated with all Denison's four dimensions of organizational culture in the literature (Denison & Mishra, 1995; Denison et al., 2006).

Supportive Leadership (LAS)

Some roles/jobs in projects are routine and non-challenging. Such monotonous jobs can lead to stress in large power distance cultures (Oruh & Dibia, 2020), hence the need for supportive leadership to provide a nurturing behaviour. The question responded to is "*leadership assist subordinates overcome problems that stop them from carrying out their tasks*." The supportive leadership mean percentage score was 80%, as the instrument returned a mean score of 4.02±0.68, implying a range of 3.34 to 4.71. The presence of high supportive leadership recorded in the study implies the importance how leadership assist subordinates to overcome the hindrances that can negatively impact on their performance. Again, the level of supportive leadership presence will be ascertained in the SEM analysis based on the interaction of leadership approach with the other concepts. Later, it will be demonstrated that supportive leadership is positively and significantly

correlated with long-term orientation and lowuncertainty avoidance. Implying that the readiness to accept new roles and adapt to change in projects is determined also by the level of supportive leadership.

Participative Leadership (LAP)

This leadersip approach is suitable in projects where the task is unclear, ambiguous and unstructured and, and the leadership is expected to provide control and clarity. The registered responses were for the question "*subordinates ask leadership for clarity and suggestions on every decision that is made on project quality (time, scope, and cost).”* The mean percentage score of participative leadership is 90% at a mean score of 4.41±0.63, implying a range of 3.89 to 5.14. Thus, implying a high presence of participative leadership. However, this high score will be evaluated in the SEM analysis to ascertain the level of participative leadership in the presence of other latent variables in the study. As seen later, participative leadership is significantly and positively correlated with low uncertainty avoidance. Thus, implying that the team members are willing to accept new and challenging roles when the leadership provides involvement through control and clarity.

Achievement-Oriented Leadership (LAA)

Projects are complex and challenging, and sometimes ambiguous, and necessitating a leadership behaviour that set challenging goals. The responses received were for the questions "*leadership consistently set challenging goals throughout the project duration.”* The mean percentage score of achievement-oriented leadership is 84% at a mean score of 4.19±0.73, implying a range of 3.46 to 4.92. The high percentage score on this indicator corroborates the challenging task activities in projects. In this research, LAA is significantly and positively correlated with low uncertainty avoidance, long-term orientation and collectivism. Again, the level

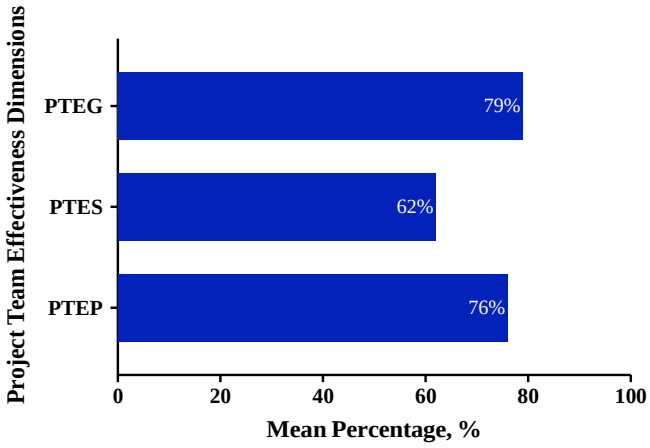
of this leadership style in projects in the industry of study will be evaluated through the SEM analysis conducted hereafter.

Project Team Effectiveness (PTE)

Project team effectiveness was measured based on the dimensions studied and evaluated in the literature: productive output, group experience and socializing process (Wageman et al., 2005). Productive output refers to the tangible results and deliverables generated by the team, reflecting their efficiency and success in meeting project objectives. The socializing process emphasizes the level of collaboration, communication, and cohesion among team members, which influences their ability to work together effectively. Additionally, the group experience factor accounted for the team members' job satisfaction, motivation, and overall well-being throughout the project duration, which determines how much of the group's work experience is available to individual team member. Figure 4.5, presents the percentage mean score for the measured indicators for this concept.

Figure 4.5

Percentage Mean Values of Project Team Effectiveness Dimensions



Below, we will discuss the performance of each of the measured indicators that represent the criteria for team effectiveness during the field survey.

Productive Output (PTEP)

The productive output of the team represents the satisfactoriness of the overall team performance to the project owner (Wageman et al., 2005). The question answered was *"team's output consistently meets specified project quality (time, cost, and scope).* A 76% mean percentage score for the mean value of 3.80±0.85 within the range of 2.95 to 4.65, signifies that the team's productive output is related to their effectiveness. As will be seen later, the productive output of project teams in the oil and gas industry is significantly (p<0.05) and positively correlated with long-term orientation culture, supportive and achievement-oriented leadership behaviours.

However, the correlation with achievement-oriented (0.40) is medium while the others are low. Implying that the productive output was driven by a high achievement-oriented leadership behaviour. A low significantly negative correlation was indicated for collectivism. Thus, buttressing the suggestion made earlier that individualism existed side by side with collectivism within the study project team. The actual position of this indicator will be investigated through the SEM.

Socialising Process (PTES)

Social cohesion has been found to positively enhance the output of a team (Salas et al., 2015). The question answered is "*socialising enhances members' capability to work together interdependently with minimal supervision."* In this context, the socialising process is aimed at setting a highly task motivating work environment (Wageman et al., 2005), through team building activities and enhanced interpersonal communication, which create the avenue for knowledge sharing and innovation. The survey instrument returned 62% mean percentage score and a mean

value of 3.09±0.75, implying a range of 2.34 to 3.85. The lower value is below the 2.5 average of the measurement scale; hence the 62% mean score suggests a moderate socialising process. As will be explained hereafter, PTES is found to be significantly and positively correlated with low uncertainty avoidance and long-term orientation culture, and achievement-oriented, directive, and participative leadership styles. The actual interactive influence of PTES in project team effectiveness will be investigated later through the SEM developed for the study.

Group Experience (PTEG)

The instrument question for this indicator was stated "*team meetings and interaction contribute positively to the learning and well-being of individual team members."* The group experience is related to the social and task-related interactions among team members that provided each member the opportunity to gain insight into the entire work process. In a team where the members are highly specialised in specific areas of the work, this indicator can be relatively low, and this can only be confirmed from the SEM discussed later. A 79% mean percentage score and a mean value of 3.93±0.92, implying a range of 3.01 to 4.85, suggest high presence of that group experience. Later, it will be seen that PTEG is significantly and positively correlated with achievement-oriented leadership, which resonates with the idea behind the survey question that group experience is aimed at enhancing learning and well-being, becoming an input into high productivity. Also, PTEG is significantly and positively correlated with PTEP and PTES; although, the correlations are low.

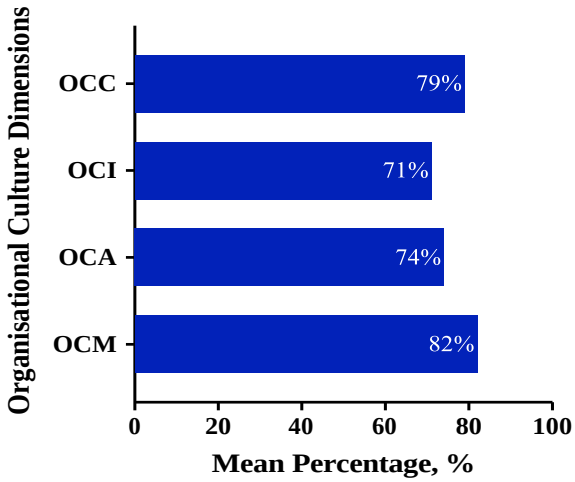
Organizational Culture (OC)

The purpose of organizational culture is to shape shared values and behaviours, nurturing the change process from the top, and ensuring the continuity of leadership (Heskett, 2012). In the present study, the significance of this indicator lies in the requirement for consistent leadership

behaviour that can enhance team effectiveness and performance. A stable leadership style is crucial for providing guidance, maintaining focus, and fostering a positive working environment within the team. This indicator highlights the importance of a leader who can inspire and motivate team members, effectively communicate goals and expectations, and make informed decisions that contribute to overall team success. By recognizing the relevance of this indicator, the study emphasizes the impact of stable leadership behavior on team dynamics and outcomes. The Denison's model invrstigated encompasses four key elements: mission, adaptability, involvement, and consistency (Denison et al., 2014), Each component plays a crucial role in organizational success. Mission provides clarity and direction, guiding the company's purpose and goals. Adaptability emphasizes the importance of flexibility and responsiveness to changing environments and market demands. Involvement fosters employee engagement and collaboration, ensuring that individuals are invested in the organization's mission. Consistency emphasizes the need for alignment and coherence across all levels, promoting a unified and harmonious organizational culture. By integrating these elements, Denison's model provides a comprehensive framework for organizations to thrive and achieve sustainable growth. The relative descriptive outcome of each indicator is presented in Figure 4.6, and will be discussed further.

Figure 4.6

Percentage Mean Values of Organizational Culture Dimensions



Mission (OCM)

The "mission" dimension of organizational culture relates to the strategic direction, goals and objectives, and the vision of the organization. Empirical results suggests that mission is significantly and positively related to overall performance (Denison et al., 2014). The question for this indicator in the survey instrument was *"goals and objectives are clearly defined, and team members understand the vision of the organization."* The mean score from the instrument is 82%, with a mean value of 4.10±0.77, implying a score range of 3.33 to 4.87. This outcome suggest that the goals and objectives are clearly defined, and team members are acquainted with the direction and vison of the organization as it relates to the rationale behind the execution of the project. As will be seen later, the "mission" as stated in this study is significantly and positively related to low uncertainty avoidance and long-term orientation culture; directive, participative, and achievement-oriented leadership; and team effectiveness through the socialising process.

Adaptability (OCA)

Adaptability in organizational culture is related to creating change, customer focus and organizational learning (Denison et al., 2014). The instrument question for this indicator is *"team members consistently and positively respond to project change process through organizational*

learning." In this research, the mean score is 74% with a mean value of 3.71±0.84, implying a range of 2.87 to 4.56. Thus, it can be inferred that most of the project team members consistently and positively respond to change process through organizational learning.

As will be presented after now, "adaptability" is significantly and positively correlated with long-term orientation culture; directive, achievement-oriented and supportive leadership styles; and the indicators of project team effectiveness. Hence, suggesting that adaptability has a strong influence on project success, which agrees with the suggestion in the literature that adaptability is positively and significantly correlated with overall performance (Denison et al., 2014). The final relative influence of this dimension of organizational culture on project success will be evaluated later through SEM.

Involvement (OCI)

"Involvement" as an indicator for organizational culture was measured in the survey instrument as, *"team members are aligned and engaged in project activities through empowerment and continual capability/competency development."* Organizations enhances the involvement of project team members through empowerment by encouraging members to take ownership of the work process, and the provision of a work environment that encourages capability development through knowledge sharing, creativity, and innovation. The survey instrument returned a mean score of 71% with a mean value of 3.57±0.96, implying a range of 2.61 to 4.53. Thus, the outcome indicates that most team members agreed that they are empowered through om-the-job opportunities to enhance their competency. "Involvement" is significantly and positively correlated with long-term orientation and negatively correlated with collectivism. This indicator of organizational culture is also significant and positively correlated with directive, participative and achievement-oriented leadership styles. It is also positively and significantly correlated with

project team effectiveness through productive output and socialising process. Implying that "involvement" influences team overall output in agreement with the position in the literature (Denison et al., 2014).

Consistency (OCC)

"Consistency" as a dimension of organizational culture is defined as the presence of core values, control though coordination and integration, and agreement with goals and objectives. The question in the measurement instrument relating to this indicator is stated as, *"organizational values, systems, and processes are in place to enhance agreement, coordination and integration among team members."* The essence of this indicator was to investigate how organizational control through the inherent culture influences leadership approach and the effectiveness of the project team.

The survey instrument returned a mean score of 79% with a mean value of 3.94±0.90, implying a range of 3.05 to 4.84. Thus, suggesting the presence of coordination and integration of project activities with organizational values, systems, and processes. As seen later, "consistency" is significantly and positively correlated with long-term orientation culture; directive and achievement-oriented leadership styles; and all the dimensions of project team effectiveness. This position is equally corroborated in the literature, that consistency is positively and significantly correlated with overall performance (Denison et al., 2014).

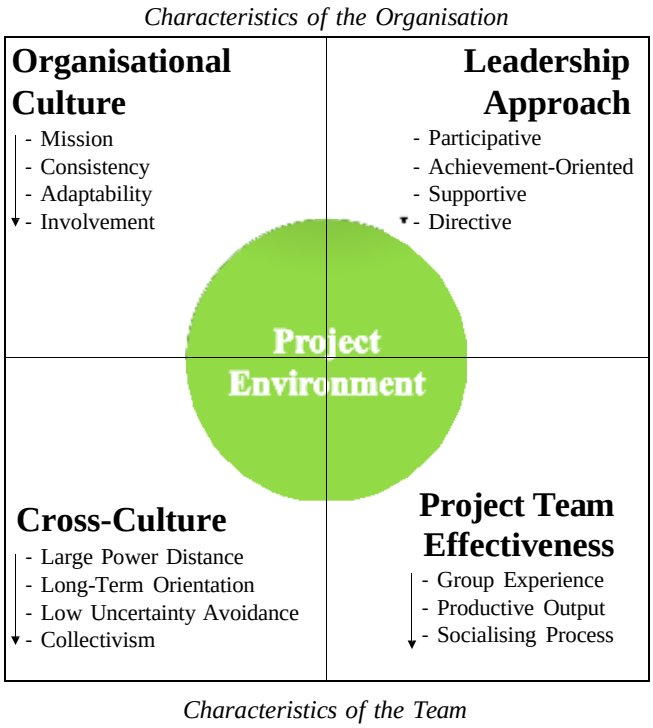
Conclusions on Measure of Central Tendency and Variability

The results of the descriptive statistics discussed so far suggests that the indicators measured are directly related to the purpose of the study. The outcomes further indicate that a high percentage of the responses were positive towards the questions stated by in the questionnaire. The project

environment model in Figure 4.7, is based solely on the descriptive information provided by the mean score without structural interactions among the variables.

Figure 4.7

Ranked Factors Influencing the Project Environment from Mean values



Detail analysis of the inter-indicator correlations is presented in the section that follows. The ranking of project controlling dimensions represented in the 4-quadrants suggests that mission, participative leadership, large power distance and group experience are the highest mean scores, and probably defines the project dynamic. However, this kind of outcome can be misleading because the analysis did not consider regression and correlations, which defines the philosophical paradigms adopted. To address this limitation, further evaluation will be conducted using correlational network analysis and structural equation modeling (SEM) as developed in this

research. This comprehensive approach aims to provide a more accurate assessment of the position presented in Figure 4.7.

Measure of Relationship

Correlations between pairs of indicators' measures provide insights into the strength and direction of the relationship between them (Mertler & Reinhart, 2016).

Table 4.15

Correlation Matrix of Measured Variables

Correlation Pearson's r	CCP	CCU	CCI	CCL	LAD	LAS	LAP	LAA	PTEP	PTES	PTEG	OCM	OCA	OCI	OCC
1. CCP	—														
2. CCU	0.10	—													
3. CCI	0.33***	0.06	—												
4. CCL	-0.12	0.03	-0.18**	—											
5. LAD	0.03	0.12	0.07	0.24***	—										
6. LAS	-0.13	0.14*	0.03	0.19**	0.07	—									
7. LAP	-0.10	0.30***	-0.09	0.07	0.16*	0.20**	—								
8. LAA	-0.06	0.17*	-0.15*	0.16*	0.29***	0.06	0.17*	—							
9. PTEP	-0.13	-0.03	-0.17*	0.24***	0.12	0.18**	0.07	0.40***	—						
10. PTES	-0.12	0.18**	-0.08	0.26***	0.27***	0.12	0.19**	0.30***	0.28***	—					
11. PTEG	-0.01	0.05	-0.03	0.12	0.10	0.02	-0.06	0.30***	0.15*	0.15*	—				
12. OCM	-0.10	0.14*	-0.13	0.27***	0.28***	0.08	0.24***	0.30***	0.11	0.34***	0.01	—			
13. OCA	0.03	0.11	-0.13	0.35***	0.27***	0.19**	0.13	0.25***	0.23***	0.40***	0.11	0.45***	—		
14. OCI	-0.10	0.05	-0.22**	0.26***	0.18*	0.12	0.20**	0.23***	0.35***	0.30***	0.08	0.36***	0.31***	—	
15. OCC	-0.10	0.06	-0.13	0.22**	0.33***	0.04	0.12	0.34***	0.29***	0.28***	0.17*	0.37***	0.31***	0.41***	—

* p < .05, ** p < .01, *** p < .001

The degree of relationship between two variables is expressed as a correlation coefficient ranging from "–1.00 to +1.00." Depending on the scale of measurements, two commonly implemented measures of relationship are the *Spearman rho* and the *Pearson r*. The *Spearman rho* correlation coefficient is suitable for analyzing data of "ordinal" nature, whereas the *Pearson r* correlation coefficient is better suited for analyzing data of "scale" nature, as evidenced in this research. The correlation matrix of the 15 indicators formed 105 correlations in Table 4.15, out of

which 57 (54%) were statistically significant. Correlation values, $r \geq 0.3$, were obtained for 16 statistically significant inter-indicator correlations, while 41 statistically significant inter-indicator

correlations were less than 0.3. Out of the 57 significantly correlated variables, 35 had a *p*-value less than 0.001, indicating highly significant correlation.

Based on the classification by Cohen (1988), the statistically significant corelations were of low to medium effect. However, based on the need of this study, both low and moderate correlation effects are satisfactory, with the aim to provide insight into factors influencing project delays and cost overrun. All the correlation relationships that are statistically significant have been asterisked in Table 4.15. In the discussions that follows, each of the statistically significant measured variables of project team effectiveness, organizational culture and cross-culture will be correlated with leadership approach. In addition, cross-culture and organizational culture will be correlated with project team effectiveness.

Cross-Culture versus Leadership Approach

The essence of this analysis is to investigate the direction of the relationship between each dimension of cross-culture and the four leadership styles adopted. Cross-culture explores how project leaders navigate and adapt their leadership approaches when working with individuals from diverse cultural backgrounds. On the other hand, the leadership approach focuses on understanding different P-G leadership styles and strategies employed by project leaders in various work contexts. By examining the interplay between culture and leadership, researchers and project leaders can gain further insights into enhancing effective leadership practices and develop strategies for successful cross-cultural project leadership. Table 4.16, presents only those correlations that were statistically significant at *p*-value less than 0.0001, 0.01 and 0.05.

Table 4.16

Significant Correlations between the cross-culture and P-G leadership Dimensions

Cross-Culture		Leadership			
		LAD	LAS	LAP	LAA
Power Distance	**CCP**	-	-	-	-
Uncertainty Avoidnace	**CCU**	-	0.14	0.30	0.17
Individualism/ Collectivism	**CCI**	-	-	-	-0.15
Long-Term/ Short-Term Orientation	**CCL**	0.24	0.19	-	0.16

Power Distance (CCP)

There was no significant correlation between the large power distance culture explained earlier and the four leadership styles. Indicating that power distance cross-culture does not significantly influence project leadership behaviour based on the path-goal leadership approach. This outcome is important as P-G leadership theory is contingent on aligning the needed task with the experience of team members (Umuteme & Adegbite, 2022). Hence, project dynamics is not determined by the feeling of inequality in the exercise of authority and power. It equally presents a picture of a workplace that is driven by expert activities where the completion of task is more important to achieving the agreed key performance indicators.

Uncertainty Avoidance (CCU)

From Table 4.16, low uncertainty avoidance is associated with supportive, participative, and achievement-oriented leadership, with the exception of directive leadership. The medium effect correlation coefficient of 0.3 between low uncertainty avoidance and participative leadership suggests that project team members are willing to take new roles when they are part of the decision-making process affecting their job. Again, as indicated by this correlation coefficient value, both achievement-oriented and supportive leadership have low correlations with low uncertainty

avoidance but signifies the importance of support and task-driven leadership on the willingness of team members to adapt to project situations and demands.

Individualism versus Collectivism (CCI)

The results discussed earlier suggested the presence of both individualistic (39%) and collectivist (61%) work culture. This indicator is not significantly correlated with directive, supportive and participative leadership styles, except a negative correlation with achievement-oriented leadership behaviour. As stated earlier, the negative low effect correlation of CCI with LAA indicates that achievement-oriented leadership relates well with those who are expertly independent as well as those who work in a collectivist work environment. It also points to the fact that performance evaluation must be done at the individual level as well as the team level.

Long-Term versus Short-Term Orientation (CCL)

The presence of long-term orientation work culture was observed from the results, as discussed earlier, and associated with directive, supportive and achievement-oriented leadership behaviours only. The non-significant association with participative leadership style addresses a major fact about project teams, as comprised of professionals in various aspects of the project activities. Again, this correlation outcome shows a subtle presence of pride and low deference to authority in project teams when it comes to the defence of professionalism.

Organizational Culture versus Leadership Approach

All the indicators of organizational culture significantly correlated with LAD and LAA. Supportive leadership is significantly correlated with “mission” and “adaptability” only, and participative leadership is significantly correlated with “mission” and “involvement” only. Details of the results are presented below.

Table 4.17

Significant Correlations between the organizational culture and P-G leadership Dimensions

Orgsnaitional Culture		Leadership			
		LAD	**LAS**	**LAP**	**LAA**
Mission	**OCM**	0.28	0.08	0.24	0.30
Adaptability	**OCA**	0.27	0.19	-	0.25
Involvement	**OCI**	0.18	-	0.2	0.23
Consistency	**OCC**	0.33	-	-	0.34

Mission (OCM)

This dimension is positively associated with all the leadership behaviours investigated in the study. However, only achievement-oriented leadership has medium correlation effect. "Mission" defines the goals and objectives, and the direction and vision of the project. So, it is not surprising that all the leadership behaviours are significantly and positively correlated with "mission."

Adaptability (OCA)

Adaptability infers positive response to change. As seen from the correlation table, adaptability domain of organizational culture requires the presence of the right leadership behaviour. As seen from the table, the right leadership behaviour can be in the form of directing, supporting or achievement-oriented, or a combination of these leadership styles. There is no significant correlation between adaptability and participative leadership, indicating that control and consistent need for clarity is not likely to encourage adaptability, as the worker might become demotivated by depending always on the leadership to achieve his or her task. The higher correlation values of 0.27 and 0.25 for directive and achievement-oriented leadership styles,

respectively, explains why task-driven leadership can encourage adaptability behaviours among the members of a professionalised work team as expected in projects.

Involvement (OCI)

This indicator provides statistical evidence of the presence of empowerment and competency development opportunities in projects, as a means of enacting alignment with organizational values. As indicated in the Table 4.17, "involvement" is associated with directive, participative and achievement-oriented leadership, and not with supportive leadership. The above indication represents reality, as supportive leadership is only provided for routine and non-challenging jobs (Northouse, 2019), hence empowerment and the need for capacity enhancement are relatively absent in projects. This is because, projects are expected to be handled by specialised teams who achieve complex non-routine tasks. Few project leaders encourage teams to bring problems and solutions to the table for discussion (Cobb & Hackman, 2003). If the "involvement" domain of organizational culture is enhanced, projects will become environments for developing problem solvers. Through "involvement" organizational drive values and defines the moral directional compass for the team.

Consistency (OCC)

"Consistency" ensures that team roles are associated with the expectations of the project sponsor. This dimension is related to the continual control of work process through established beliefs and assumptions, to ensure they are aligned with established work process. Thus, the medium correlation value (>0.3), and the significant and positive association of "consistency" is with both directive and achievement-oriented leadership is expected.

Project Team Effectiveness versus Leadership Approach

Earlier, team effectiveness was explained as the productive output of the team enhanced through the socialising process and group experience. The effectiveness of the team was more inclined to achievement-oriented leadership behaviour where tasks are complex and challenging provided the leadership provides clarity, and motivation through incentives and rewards. This corroborates the suggestion in literature, that "… a team's purposes actually have to be challenging, clear, and consequential" (Hackman, 2002, p. 72). Details of the discussion on the corelation results are provided, below.

Table 4.18

Significant Correlations between Project Team Effectiveness and P-G leadership Dimensions

Project Team Effectiveness		Leadership			
		LAD	**LAS**	**LAP**	**LAA**
Productive Output	**PTEP**	-	0.18	-	0.40
Socializing Process	**PTES**	0.27	-	0.19	0.30
Group Experience	**PTEG**	-	-	-	0.30

Productive Output (PTEP)

The result suggests that the productive output of project teams in the Nigerian oil and gas industry is more associated with achievement-oriented leadership behaviour. A low correlation with supportive leadership also indicates that project success is more inclined towards the achievement of non-routine tasks. No significant correlation was obtained for directive and participative leadership, thus suggesting that projects are comprised of complex and challenging tasks, that are executed by a team of specialised workforce.

Socialising Process (PTES)

Project success is dependent on social, environmental and economic factors (Kloppenborg, 2015). Accordingly, the literature emphasises that organizational culture defines values, social rituals, and symbols shared within the team and among members. Social rituals are integrated in the work process through a socialising process. In effect, the nature of the interactions among team members can define how socialising can enhance the effectiveness of the team towards work achievement. The non-significant correlation with supportive leadership also buttresses the fact that projects are relatively comprised of highly skilled tasks.

Again, participative leadership is lower in correlation values when compared with both directive and achievement-oriented leadership behaviours. This indicates that the socialising process is an outcome of the interaction of team members as they follow the directives given by the leadership and working towards achieving the project goals within the specified time and allocated budget to avoid cost overrun.

Group Experience (PTEG)

This indicator of team effectiveness provides insight into how the interactions among the members of a team enhances their understanding of the entire work process. From Table 4.18, the only leadership approach that correlates with group experience is achievement-oriented leadership behaviour. With a medium correlation effect ($r = 0.3$), the result suggests that task-oriented teamwork towards achieving the project goals can enhance the productive interactions among team members.

Cross-Culture versus Project Team Effectiveness

The dominant cross-cultural dominion based on the outcome suggests that long-term orientation drives productivity and socialising process. This cross-cultural dimension was not

significantly related to the group experience. Group experience is related to a situation where team members want to learn from others as a way of expanding their knowledge, acquiring new skills, and exploring other world views that differ from their own (Hackman, 2002). Since none of the cross-culture dimensions studied were significantly correlated with PTEG, it implies that the rationale behind team members working in projects in the Nigerian oil and gas industry is not primarily to enhance group experience.

Although, this position is supported in literature that some decisions in projects are best made by an individual with the right expertise (Kloppenborg, 2015). This allusion shows that there will always be the presence of varied level of competence in the team. However, as indicated earlier, group experience is possible in achievement-oriented leadership. Which was positively related to low uncertainty avoidance and long-term orientation cultures. And since the collectivism is negatively related with achievement-oriented leadership as discussed earlier, suggests that group experience is possibly enhanced on the interpersonal level.

Table 4.19

Significant Correlations between Cross-Culture and Project Team Effectiveness Dimensions

Cross-Culture		Project Team Effectiveness		
		PTEP	**PTES**	**PTEG**
Power Distance	**CCP**	-	-	-
Uncertainty Avoidnace	**CCU**	-	0.18	-
Individualism/ Collectivism	**CCI**	-0.17	-	-
Long-Term/ Short-Term Orientation	**CCL**	0.24	0.26	-

Power Distance (CCP)

From the correlation matrix table, large power distance is not significantly correlated with any of the criteria for team effectiveness. This result is corroborated in the literature that large power distance do improve team effectiveness (Jr et al., 2013). In large power-distance cultures, there is strict adherence to hierarchy-based relationship between the leadership and the team (Hofstede, 2011). Earlier, it was shown that large power distance was also not significantly associated with any of the leadership styles studied in this research. This is also corroborated elsewhere that strict hierarchical leadership structures do not enhance team performance (Hackman, 2002). Also, the outcome of the study by Eylon and Au (1999) suggest that large power distance is negatively correlated with team empowerment.

Thus, it is established from here that team effectiveness is mainly dependent on the leadership approach. The "involvement" dimension of organizational culture is found to be negatively associated with large power distance culture, although the correlation is not statistically significant. Empowerment and competency development is the defining criteria of the "involvement" dimension of organizational culture. For a team that is empowered as in project teams in the Nigerian oil and gas industry because of the need for team members to achieve agreed task and targets with minimal supervision, it is most likely that large power distance culture will have no significant association with project team effectiveness.

Uncertainty Avoidance (CCU)

The outcome of the investigation reports low uncertainty avoidance based on the framing of the question in the survey instrument, "*there is consistent need for clarity of roles and the structure of the team*." Implying that a higher mean value suggests uncertainty acceptance. As indicated in the Table 4.19, low uncertainty avoidance is only associated with the socialising

process variable of team effectiveness. The socialising process encourages "…shared commitment, collective skills, and task-appropriate coordination strategies…" (Hackman, 2002, p. 30). This explains why project team members need clarity of roles and the team structure to reduce mutual oppositions because of roles-related work friction. Hence, low uncertainty avoidance is possible when there is shared commitment through task-related work coordination.

Individualism versus Collectivism (CCI)

The results presented earlier suggests a moderate collectivist work culture. From the correlation matrix discussed earlier, this indicator of cross-culture is not significantly correlated with both socialising process and group experience indicators of team effectiveness. Here, collectivism is significantly and negatively associated with the team's productive output. As explained above, the low uncertainty avoidance culture was premised on the need for clarity of roles and team structure, which indicates the presence of some level of individualistic culture in project teams. Thus, suggesting that the productive output is not driven only by a collectivist ideology, but also by an individualistic culture. Implying further, that the productive output in projects in the Nigerian oil and gas industry is skewed towards expert-related work output than collective skills.

Long-Term versus Short-Term Orientation (CCL)

Long-term orientation culture defines the adaptability of the team to change, and it is positively and significantly correlated with the productive output (PTEG) and socialising process (PTES) of the team. Implying that the desire for future roles can be the determination for team members' commitment to high productive output through shared commitment and strategies that enhances task-related work structure. Earlier, it was also observed that long-term orientation was

positively and significantly related to directive, supportive and achievement-oriented leadership behaviours.

By relating the position here with the correlation table for project team effectiveness versus leadership, it can be shown that supportive and achievement-oriented leadership styles enhance productive output, while the team's socialising process is encouraged by directive, participative and achievement-oriented leadership work environment. Hence, whereas achievement-oriented leadership is common to both productive output and socialising process of team effectiveness, the combination of the leadership styles varies. This buttresses the fact that project team leadership styles are related to the project situation (Hackman, 2002).

Organizational Culture versus Project Team Effectiveness

As indicated in Table 4.20, all the dimensions of organizational culture investigated are significantly and positively associated with the team's socialising process. This suggests that the effectiveness of the work team is highly dependent on the organizational culture through shared commitment, collective skills, and task-coordinated strategies.

The socialising process provides the breeding ground for adaptability, as suggested by the highest correlation value of 0.4 on the PTES column, and the productive output is driven by an "involvement" *organizational* culture which creates *the* avenue for empowerment and capability enhancement as seen by the highest correlation *coefficient* of 0.35 on the PTEP column. Details of the correlations between organizational culture and project team effectiveness will be discussed further below.

Table 4.20

Significant Correlations between the Organizational Culture and Project Team Effectiveness Dimensions

Organisational Culture		Project Team Effectiveness		
		PTEP	**PTES**	**PTEG**
Mission	**OCM**	-	0.34	-
Adaptability	**OCA**	0.23	0.40	-
Involvement	**OCI**	0.35	0.30	-
Consistency	**OCC**	0.29	0.28	0.17

Mission (OCM)

The" mission "dimension of organizational culture defines the goals and objectives, and the direction and vision of the project. This indicator is only significantly and pistively associated with the socialising process within the team in Table 4.20. As stated earlier, the socialising process encourages shared commitment. Thus, the outcome indicates that the "shared commitment" includes the shared common goals and objectives, and the shared compelling direction and vision of the project owner.

Adaptability (OCA)

"Adaptability" dimension of organizational culture is significantly and positively associated with productive output and socialising process of the team, and not with group experience. This implies that the need for a team member's adaptability to the changing project dynamics is driven by the need to improve the team's productive output through the team's socialising process. As seen from Table 4.20, the highest correlation value ($r = 0.4$), was obtained for the relationship between adaptability and socialising process.

Involvement (OCI)

The high mean value for "involvement" in Figure 4.6, indicates the presence of empowerment and competency development opportunities. As shown in the table of correlations, "involvement" is significantly and positively associated with productive output ($r > 0.3$) and socialising process ($r = 0.3$). This moderate effect of "involvement" on both PTEP and PTES, suggests that empowerment can improve a team's productivity and commitment to the goals and objectives, and the direction and vision of the organization.

Consistency (OCC)

The "involvement" dimension of organizational culture is enhanced through the enforcement of "consistency" in the form of controls, established beliefs and assumptions, to ensure team members are aligned with the established work processes. The "consistency" dimension is significantly and positively associated with all the three dimensions of the team's effectiveness. When compared with the position in Table 4.17, it can be shown that enforcing "consistency" is more associated with both directive and achievement-oriented leadership behaviour.

Correlation Network Analysis

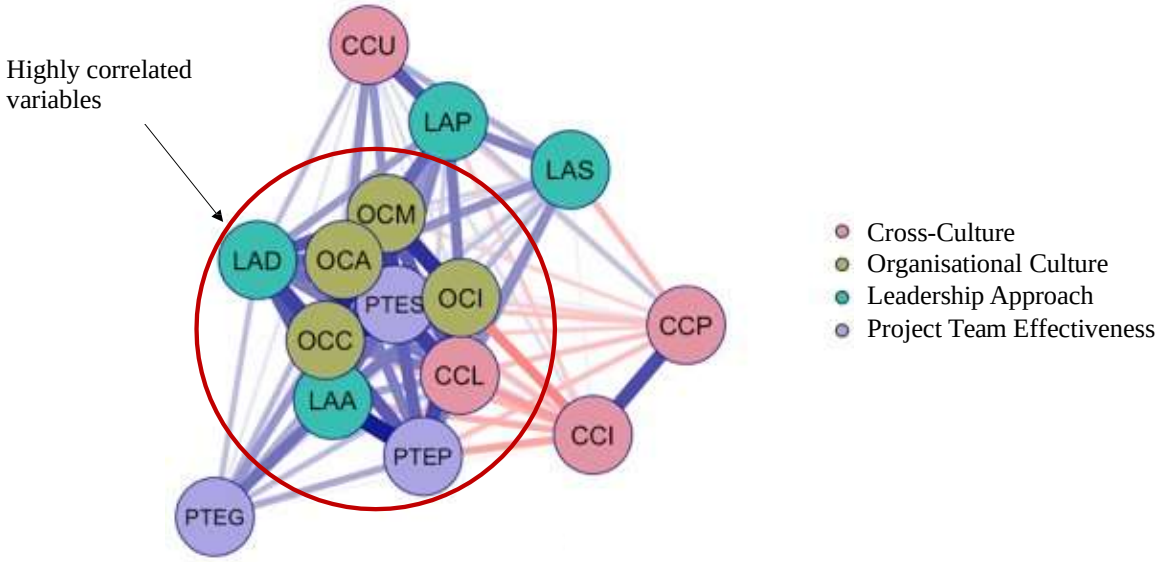
Correlation network analysis, also known as correlation network inference or correlation-based network analysis, is an analytical procedure used to study the connections between variables in complex systems. The analysis provide a means to visualise the correlation matrix of the paired variables in dataset by directly determining the relationship between measured variables (Epskamp et al., 2012; van den Bergh, 2018). Each node of the directed graph represents a dimension of the investigated latent variables, and each edge represents a correlation between two dimensions. The stronger the correlation, the thicker the edge becomes and more saturated (Epskamp et al., 2012),

and the strength of the relations is defined by centrality measures. Higher centrality measures determine the nodes that are central to the network, and these nodes are the dimensions defining the success of the project.

Generally, the centrality tests measure the estimates of the distances between the nodes, and the node with increasing short distances passing through it is also higher. Correlation network analysis can help identify variables that are highly connected or centrally positioned in the network. These variables may play crucial roles in the system and have a significant influence on other variables. Correlation network analysis can unveil underlying structures or patterns that may not be evident from individual variable analysis. It can identify groups of variables that exhibit similar behavior or are strongly associated with each other, even if they are not directly correlated. From the foregoing, a network of the correlation is plotted using JASP® software. The results show a cluster of highly correlated variables of the four concepts investigated at the centre.

Figure 4.8

Correlation Network Analysis of the Measured Variables

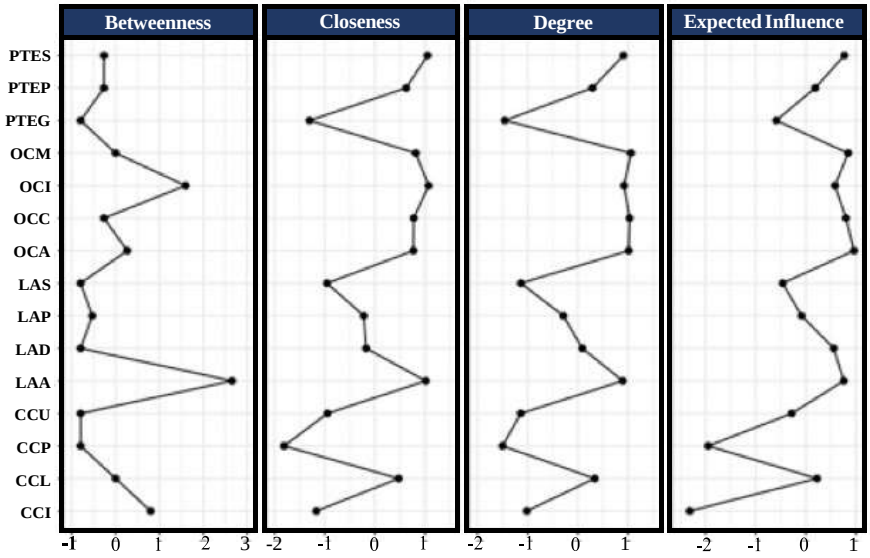


All the measured variables of organizational culture (Adaptability (OCA), Mission (OCM), Consistency (OCC) and Involvement (OCI)); two measured variables of leadership approach (Achievement-Oriented and Directive leadership); two variables of project team effectiveness (Productive Output and Socialising Process); and one variable of cross-culture (Long-Term Orientation) are placed in the cluster at the centre. Implying that project activities are driven mainly by the organizational culture.

A closer visual insight into the crowded area suggests that achievement-oriented leadership (LAA) is defined mainly by the "consistency" (OCC) dimension of organizational culture. The proximal position of directive leadership (LAD) can be trajected to three dimensions of organizational culture: Adaptability (OCA), Mission (OCM), Consistency (OCC), hence LAD is defined by OCM, OCA and OCC. Further analysis of the distances between the variables suggests that productive output is enhanced mainly by achievement-oriented leadership (LAA) and long-term orientation dimension of cross-culture (CCL).

Figure 4.9

Correlation Network Analysis Centrality Plots

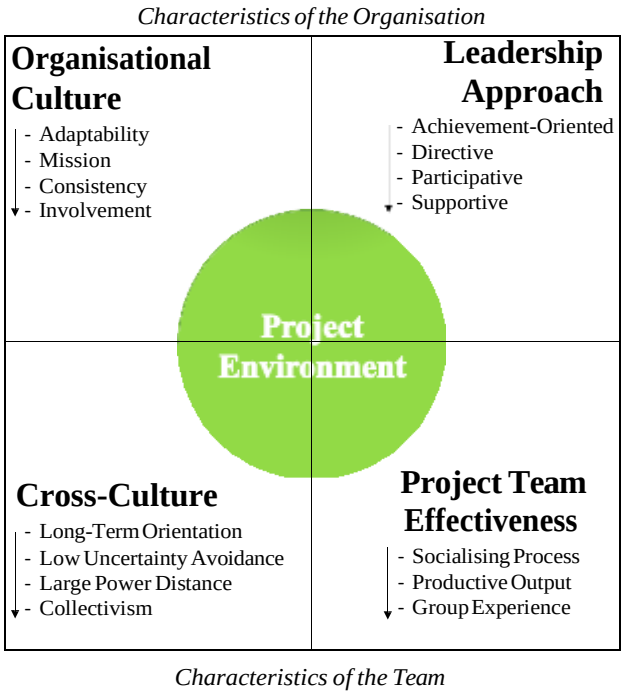


Furthermore, the socialising process of team effectiveness is enhanced mainly by three dimensions of organizational culture: Adaptability (OCA), Involvement (OCI) and Consistency (OCC). The information in the centrality plot indicates the expected influence of each of the measured variables. The order of ranking for the dimensions starts with the row having the higher value in the "Expected Influence" column.

As seen from the chart on "expected influence (EI)," project activities are driven mainly by variables with EI >0 as follows in descending order: Project team effectiveness (socialising process and productive output); Organizational culture (adaptability, mission, consistency, and involvement); Leadership approach (achievement-oriented and directive leadership); and cross-culture (long-term orientation). From here, the presence of each dimension based on correlation interaction is presented in Figure 4.10.

Figure 4.10

Ranked Factors Influencing the Project Environment from Correlation Network Analysis



Conclusions on Inter-Indicator Correlations

Table 4.21 present the relevant information supported by the correlation analysis conducted. A cut-off correlation coefficient of 0.15 was chosen to determine the significance of the results presented in the table. This threshold indicates that only correlations with coefficients greater than or equal to 0.15 are considered meaningful or statistically significant for analysis and interpretation. The dimensions were examined within different cultural contexts, and their associations with variables of leadership and project team effectiveness were established. Only correlation coefficients that of statistical significance were considered in analyzing these relationships.

Table 4.21

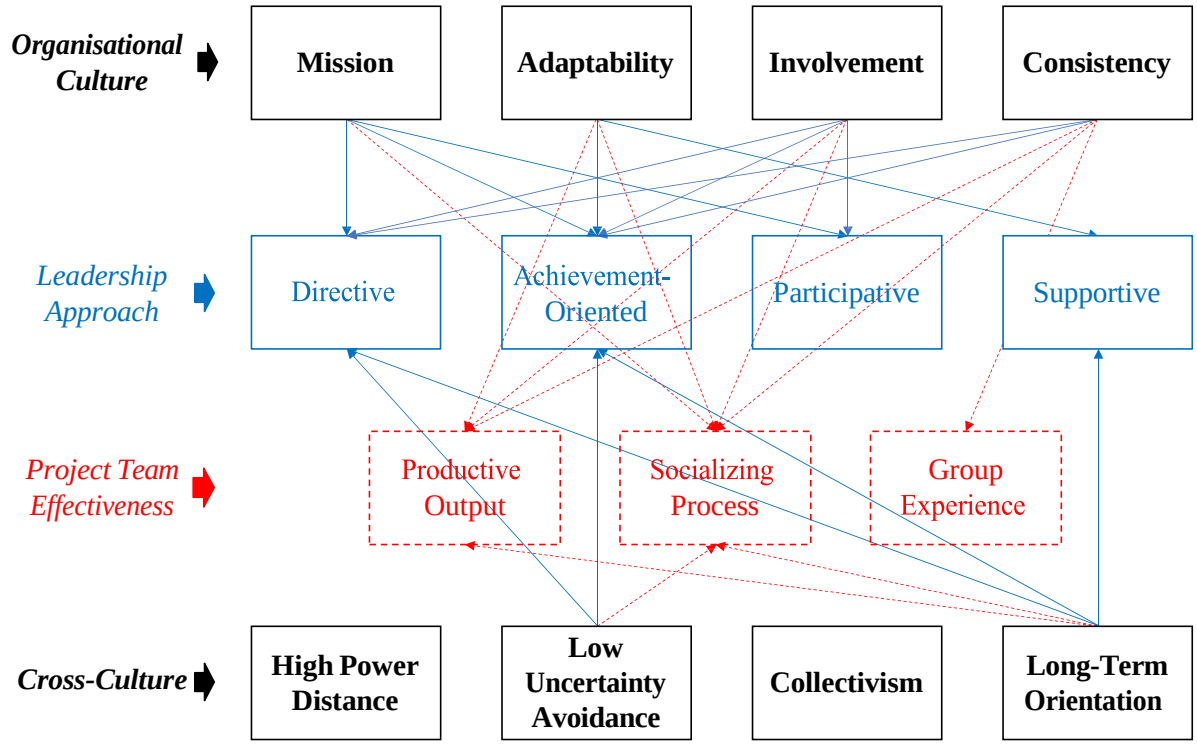
Outcome of Correlation Analysis

Frame of Reference	**Dimensions**	**Leadership Approach: r>0.15**	**Project Team Effectiveness: r>0.15**
Organisational Culture	Mission	Directive; Participative; Achievement-Oriented	Socialising Process
	Adaptability	Supportive; Achievement-Oriented	Productive Output; Socialising process
	Involvement	Directive; Participative; Achievement-Oriented	
	Consistency	Directive; Achievement-Oriented	Productive Output; Socialising process; Group Experience
Cross-Culture	High Power Distance	-	-
	Low Uncertainty Avoidance	Directive; Achievement-Oriented	Socialising Process
	Collectivism	-	-
	Long-Term Orientation	Directive; Supportive; Achievement-Oriented	Productive Output; Socialising process

Futhermore, a unique mapping technique was developed to reveal the relationship presented in Table 4.21, and the relative importance of various indicators in determining the existing project environment within the industry. This analysis involved quantifying the number of arrows pointing towards leadership and project team effectiveness. These arrows symbolized the relationships and correlations between different indicators. The total number of arrows originating from either of the cultural contexts will determine which culture dominates and controls the direction of project activities. By employing this method, the analysis aimed to identify the key drivers and influential factors affecting the project environment within the industry. This ranking approach is novel and peculiar to this research, with details presented below in Figure 4.11.

Figure 4.11

Correlation Links between Measured Dimensions



Step 1: involves drawing arrows from both cultural perspectives to the correlated indicator of leadership approach (blue lines) and project team effectiveness criteria (dashed red lines).

Step 2: For each indicator, the total numbers of arrows are counted and recorded. Where the number are equal, the preference will be from the cultural perspective having the highest arrows.

Step 3: The numbers of arrows are ranked from highest to lowest to determine which of the variables contributed more to the interaction of either leadership approach or project team effectiveness with both cultural perspectives.

Leadership Approach: Figure 4.11, indicate that 4 arrows from organizational culture and 2 arrows from cross-culture, making a total of 6 arrows, points to achievement-oriented leadership; 3 from organizational culture and 2 from cross-culture, making a total of 5 arrows, points to directive leadership; 2 arrows from organizational culture only points to participative leadership; and 1 arrow from organizational culture and 1 from cross-culture, making a total of 2 arrows, points to supportive leadership. Thus, ranking the order of relevance from both cultural perspectives, the leadership behaviours in project teams in order of presence are LAA, LAD, LAP and LAS. The total arrows pointing from cultural perspective indicate that organizational culture (10 arrows) defines the leadership behaviour in preference to the cross-culture in the team (5 arrows).

Project Team Effectiveness: The total arrows pointing to productive output from both cultural perspectives are 4 made up of 3 from organizational culture and 1 from cross-culture; a total of 6 arrows points on socialising process made up of 4 from organizational culture and 2 from cross-culture; and only 1 arrow from organizational culture linked to group experience. The order of preference is socialising process, productive output, and group experience. Again, the results indicate that project team effectiveness is driven by the organizational culture. Accordingly, the

work culture in the organization is significant in determining the behaviour, norms, and assumptions within a project team. A strong and positive organizational culture can promote teamwork, collaboration, and effective communication, thereby enhancing the overall PTE in achieving project goals.

Consequently, the order of preference for both LA and PTE compared favourably with the corresponding measured indicators in Figure 4.10, but the ranked order of organizational culture and cross-culture could not be ascertained from Figure 4.11. The current analysis outcome is not entirely convincing. Therefore, further investigation is required using a structural equation model to examine the variables that determine dynamics within the project environment.

Table 4.22

Ranked Order of the Dimensions of LA and PTE

Concept	**Order of Presence in Project Environment**	**Influence of Culture**
Leadership Approach	Achievement - Oriented Directive Participative Supportive	**Definition of Leadership Behaviour:** Organization Culture, followed by Cross-Culture
Project Team Effectiveness	Socialising Process Productive Output Group Experience	**Regulation of Team Activities:** Organization Culture, followed by Cross-Culture

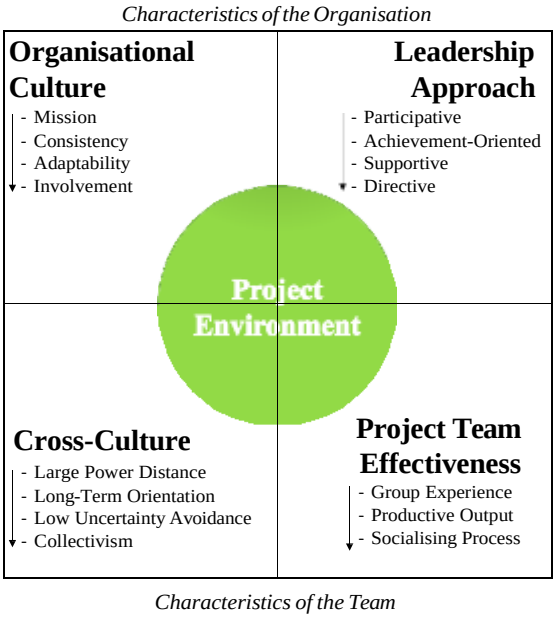
Finally, the figure below demonstrates some variation in the order of cultural indicators, as obtained from both the percentage of means in Figure 4.7 and the correlation network cluster analysis in Figure 4.10. Consequently, the pivotal role of organizational culture lies in the interchange between its indicator variables in both Figure 4.12a and Figure 4.12b. The "mission" of the organization emerges as a driving force, shaping the overall culture in Figure 4.12a. When examining the impact of correlational interaction in Figure 4.12b, it becomes evident that the

"adaptability" domain assumes primary responsibility for instilling the expected norms among team members. The dynamics of organizational culture hinge upon a comprehensive exploration of these indicator variables. Rather than isolating individual elements, recognizing their interconnectedness is essential for comprehending the broader operational cultural framework. Similarly, the order of presence of the mesuared varibales of leadership, team effectiveness and cross-culture varied across Figure 4.12a and Figure 4.12b. The ideal scenario in projects is a correlational interaction, hence, the order predicted in Figure 4.12b is reasonable at this stage. However, this ranked order of importance will be verified from the SEM, which presents a closer interaction based on both mediation and moderation effects, as expected in reality.

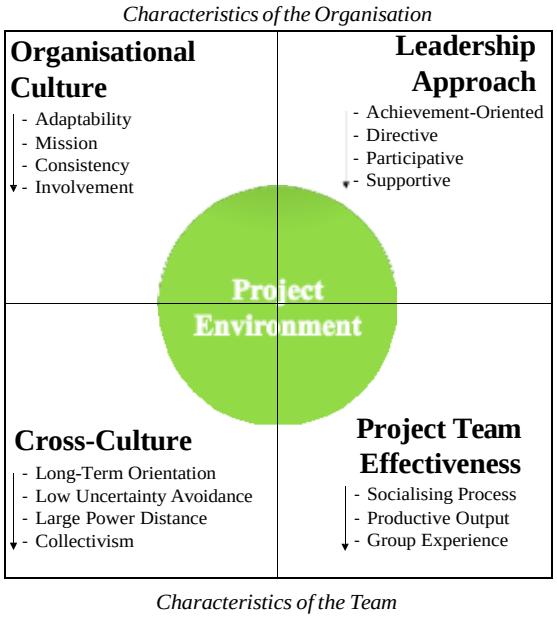
Figure 4.12

Comparing Ranked Factors Influencing the Project Environment

(a) Percentage of Mean Value Analysis



(b) Correlation Network Analysis

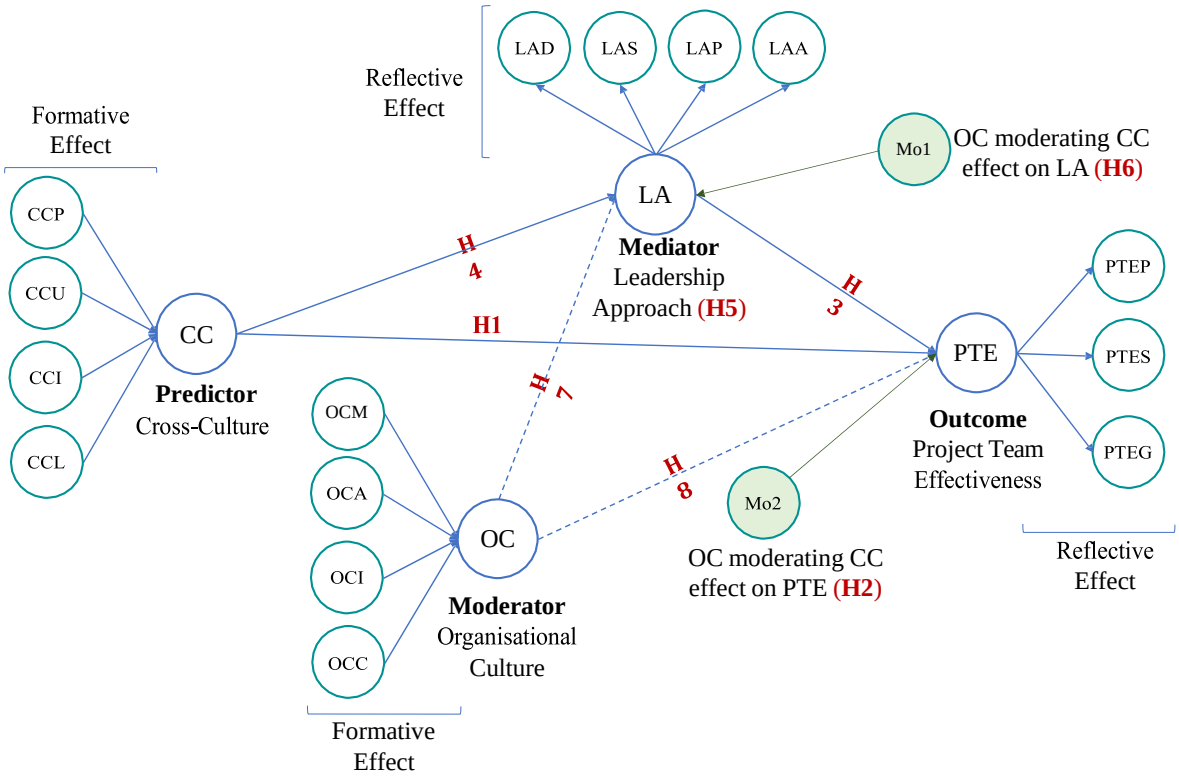


Hypothesis Testing

The path coefficients is the extent of change in the outcome variable for change of one unit of the predictor variable. The t-test assesses whether the path coefficient is significantly different from zero. If the path coefficient is not statistically significant (i.e., the t-value is not significant), implying that the variable did not significantly predict the outcome. If the path coefficient is significant, the sign of the value is examined. If the sign of the coefficient is positive, it is interpreted that for a unit increase in the predictor variable, the outcome variable will increase by the coefficient value. If the sign of the coefficient is negative, it is interpreted that for a unit increase in the predictor variable, the outcome variable will decrease by the coefficient value. The hypotheses tested are depicted in the complex model presented below.

Figure 4.13

Simulated Theoretical Framework and Hypotheses Description



However, the increasing concern of rejecting a null hypothesis based on $p \leq 0.05$ has led to the implementation of a combination of criteria to enable the null hypothesis "reject" or "do not reject." The *a priori* statistical power was set to 0.8 during the determination of the sample size in chapter 3. Furthermore, the estimated Pearson correlation (r) value, R-squared and the path coefficient for each hypothesis must be within the 95% CI with a T-statistic value greater than the critical value of 1.690 for two-tailed CI ($t_{'(0.)+}$ $_{!} \geq 1.690$) and the degree of freedom ($n - 1$).

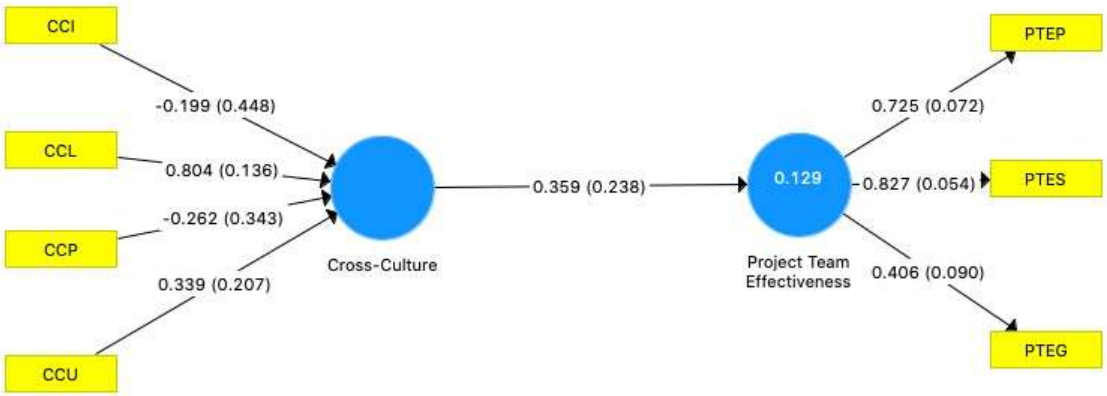
Also, the predicted R^2 value for both leadership approach and project team effectiveness must be greater than the theoretical R^2>=0.25 used to determine the sample size

Hypothesis 1

The first null hypothesis that will be tested is stated as: *(H10) – There is no significant positive relationship between CCD and PTE.* The intent is to investigate the nature of interaction existing between the dimensions of cross-culture and the adopted leadership approach. Thus, this hypothesis can provide further insight into the question that seek to understand the direct impact of cross-cultural dimensions in a project team on the effectiveness of the project team in the oil and gas industry in Nigeria. Figure 4.14, is the investigated direct link between CCD and PTE.

Figure 4.14

SEM Construct for Hypothesis H1



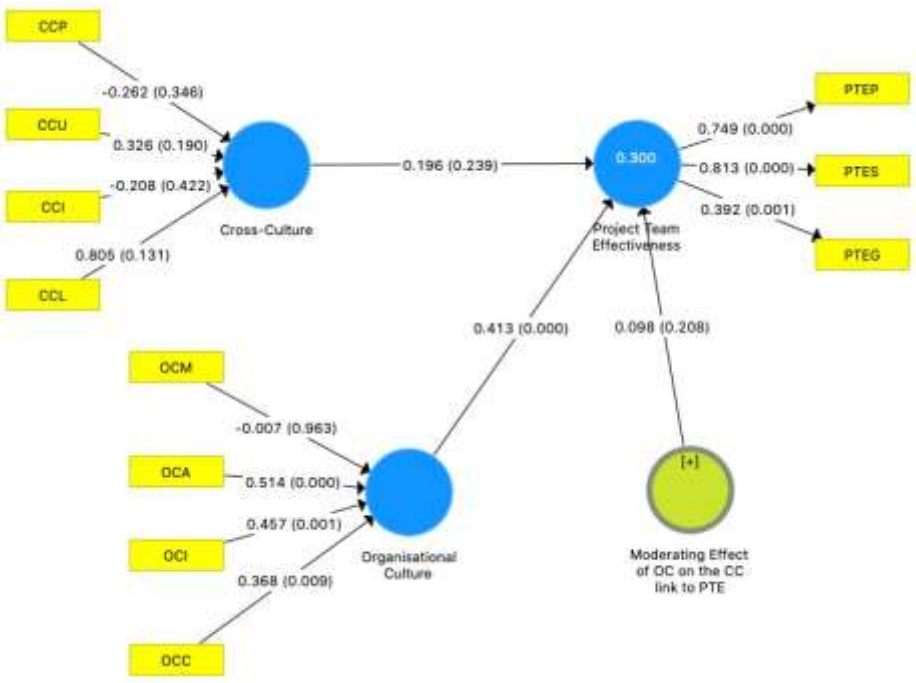
From the simulation results, the loadings of the predictors of CCD and PTE are not statistically significant. The predicted R^2 value is less than 0.25, and the path coefficient is also not significant. Hence, the null hypothesis (H10) is partially accepted based on statistical evidence above. Therefore, the investigation did not yield enough evidence to fully support the alternate hypothesis (H1a). This further explain why cross-culture alone do not determine project team effectiveness. The next hypothesis (H2) will test the moderating effect of organizational culture on H1 to further investigate if there will be a significant relationship between CCD and PTE under this scenario.

Hypothesis 2

The second null hypothesis proposed is stated as follows: *(H20) - There is no significant positive moderating effect of OC on the direct positive relationship between CCD and PTE..*

Figure 4.15

SEM Construct for Hypothesis H2



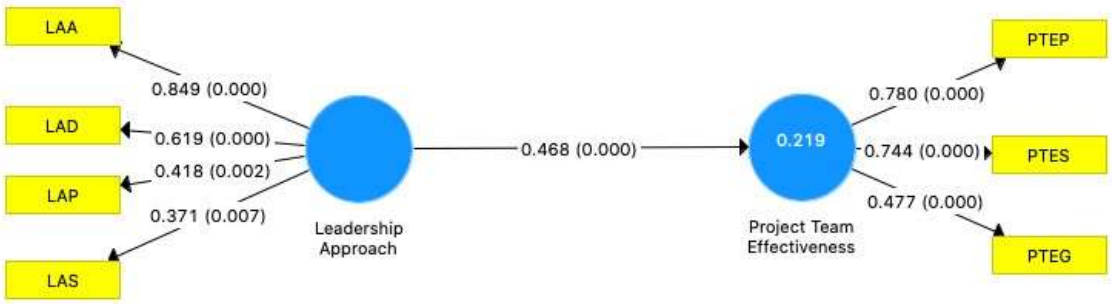
This hypothesis is important because it studies the moderation interaction of organizational culture and cross-culture. Under this interaction, the predictive power of project team effectiveness improved, with R^2=0.3, which is greater than the set threshold of 0.25 for this study. Also, whereas there was a positive significant relationship between OC and PTE, the relationship between CCD and PTE is still not significant. Thus, the improvement in the predictive power is based on the influence of OC in the investigated construct. Furthermore, the results suggest that there is no moderation effect of OC on the causal connection between CCD and PTE. Hence, H20 is partially accepted because there is not enough evidence to fully reject the alternate hypothesis (H2a). The determining dimensions of OC are in the order adaptability (OCA), involvement (OCI), consistency (OCC) and mission (OCM), with "mission" being the only non-significant dimension. The respective order of PTE dimensions remained unchanged from that in H1 – socialising process (PTES), productive output (PTEP) and group experience (PTEG).

Hypothesis 3

The third null hypothesis investigated in this doctoral research is stated as follows: *(H30) - There is no significant positive relationship between LA and PTE.*.

Figure 4.16

SEM Construct for Hypothesis H3



As indicated in Figure 4.16, there is a positive significant relationship between LA and PTE, hence the null hypothesis (H30) was rejected in favour of the alternate hypothesis (H3a). This outcome is important because it strengthens the position of leadership in enhancing project success. The R^2 value of 0.219 suggests that 21.9% of the variance of project team effectiveness is attributed to variance in the leadership approach. From the construct for H3, all the dimensions of LA and PTE are statistically highly significant. For LA, the order of ranking of leadership behaviour in improving PTE is achievement-oriented ⟶ directive ⟶ participative ⟶ supportive leadership, while on PTE the team performance is reflected in the order of productivity, socialising process, and group experience. The order of PTE dimensions in H2 is relatively different as socialising process was on top of the order and followed by productivity and group experience. This order will be investigated further in the subsequent hypotheses. However, the R^2 for team effectiveness value from LA alone is still below the expected threshold value of $R^2 = 0.25$ theorised as the expected variance. Already in H3, the value of R^2 was higher at 0.30, hence an interaction of LA and OC is expected to improve the R^2 value for PTE.

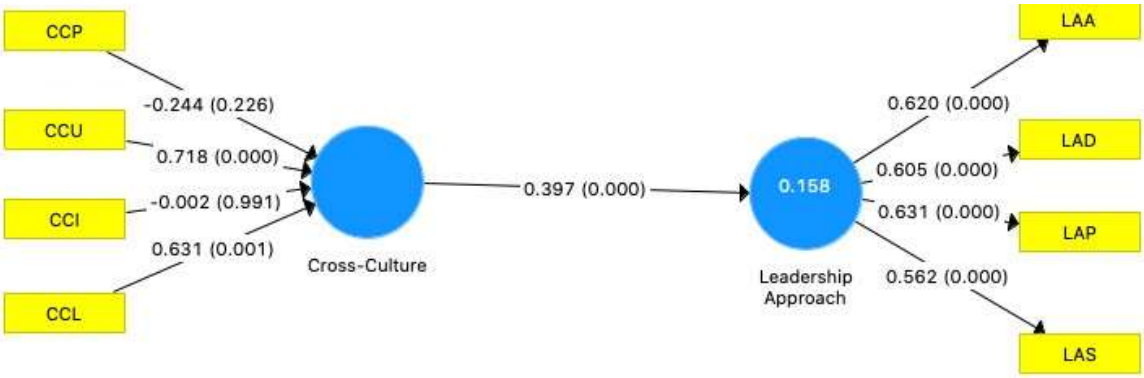
Hypothesis 4

It was also imperative to examine the direct link between cross-culture and the adopted leadership approach in a project setting. Thus, the fourth null hypothesis is stated as follows: *(H40) – There is no significant positive relationship between CCD and LA.* The outcome of this investigation in Figure 4.17, shows that CCD is significantly and positively related to LA with a 15.8% variance in PTE. Hence, the null hypothesis (H40) is rejcted in favour of the alterbnate hypothesis (H4a). This investigation was important because there was no significant relationship between CCD and PTE, and since the CCD in the team cannot be overemphasised, and LA already

has a significant positive relationship with PTE, the outcome of this hypothesis will determine if LA can provide a mediating influence on the relationship between CCD and PTE.

Figure 4.17

SEM Construct for Hypothesis H4



This implies that CCD can determine the adopted leadership approach, which resonates with the theory of path-goal leadership, where the characteristics of the team influences the leadership behaviour. Unlike in H2 and H3, the order of leadership approach resulting from the influence of CCD in a project environment is participative, achievement-oriented, directive, and supportive. Also, while CCD in H1 had no significant outer loadings, when interacting with PTE, two dimensions of CCD – uncertainty avoidance (71.8%) and long-term orientation (63.1%) are the only positive and significant loadings of CCD while interacting with leadership approach. Power distance (-0.244) and individualism and collectivism (-0.002) are non-significant negative loadings of CCD under this scenario.

Thus, long-term orientation (CCL) and uncertainty avoidance (CCU), determines the order of the leadership approach by 71.8% and 63.1%, where participative leadership (LAP) is most desired. The correlations between CCU and LAP is 30% while that for CCL is 7%, suggesting that

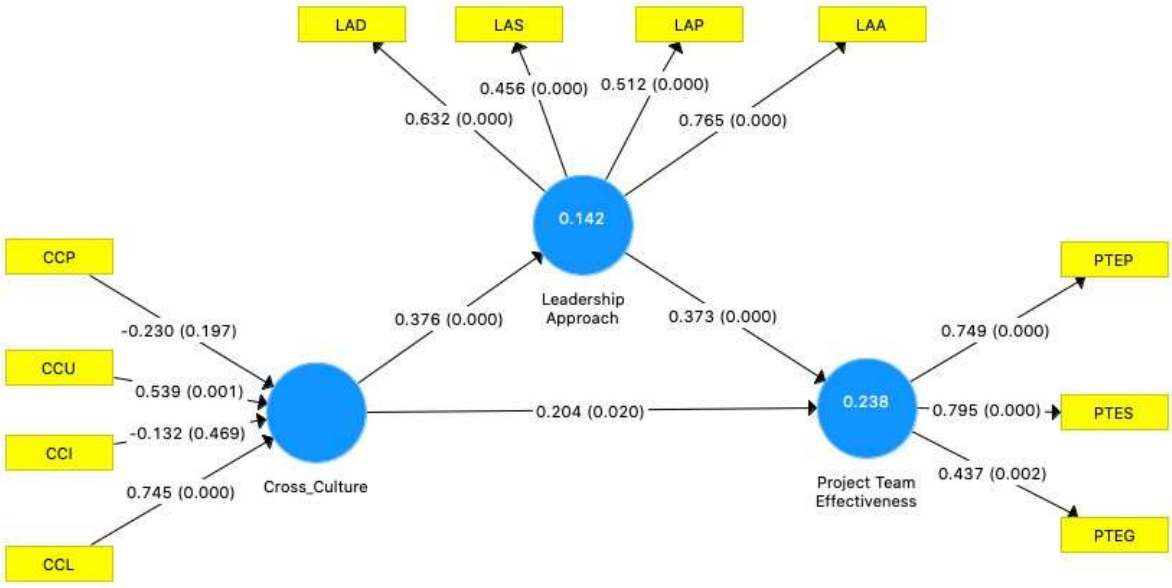
CCU determines the need for a participative leadership approach in projects in industry. Hence, the desire of team members to take more roles is contingent on the adoption of participative leadership behaviour.

Hypothesis 5

This hypothesis will test the mediating effect of leadership in the connection between CCD and PTE, and the null hypothesis is stated as follows: *(H50) - There is no significant positive mediating effect of LA on the significant positive relationship between CCD on PTE.* The R^2 value has increased to 23.8%, unlike when CCD and LA predicted PTE independently with R^2 values predicted by CCD and LA being 12.9% and 21.9%, respectively. Thus, the CCD in the team can be mediated to influence PTE by the adopted leadership approach.

Figure 4.18

SEM Construct for Hypothesis H5



From H3 and H4, it was confirmed that LA and PTE are positively and significantly related, and that CCD and LA are also positively and significantly interconnected. Under this interactive scenario, with the leadership assuming a mediating role between CCD and PTE, the positions of the earlier dimensions in CCD, LA and PTE have been altered. This is to reflect the complex reality that exists in a project setting where these concepts interact to define project performance.

Earlier in H3, an achievement-oriented leadership behaviour was adopted to drive productivity as the most important outcome of team effectiveness, when the direct link between LA and PTE was studied. Also, in H4 low uncertainty avoidance cross-culture in the team influenced the need for a participative leadership approach based on the need to minimise task and role uncertainties. The outcome of H5 suggests that the interaction of CCD and LA on PTE presents the reality that cross-culture infused the preference of socialising process over productive output, where teamwork interdependently improve performance, while LAA is still the top-ranking leadership behaviour. The project dynamics is driven by a long-term orientation culture. Thus, the effectiveness of the team in delivering the project objectives from a highly achievement-oriented leadership perspective is the need for teamwork that is driven by social cohesion, where team members fulfil their long-term goals and psychological needs through the display of adaptive organizational behaviour.

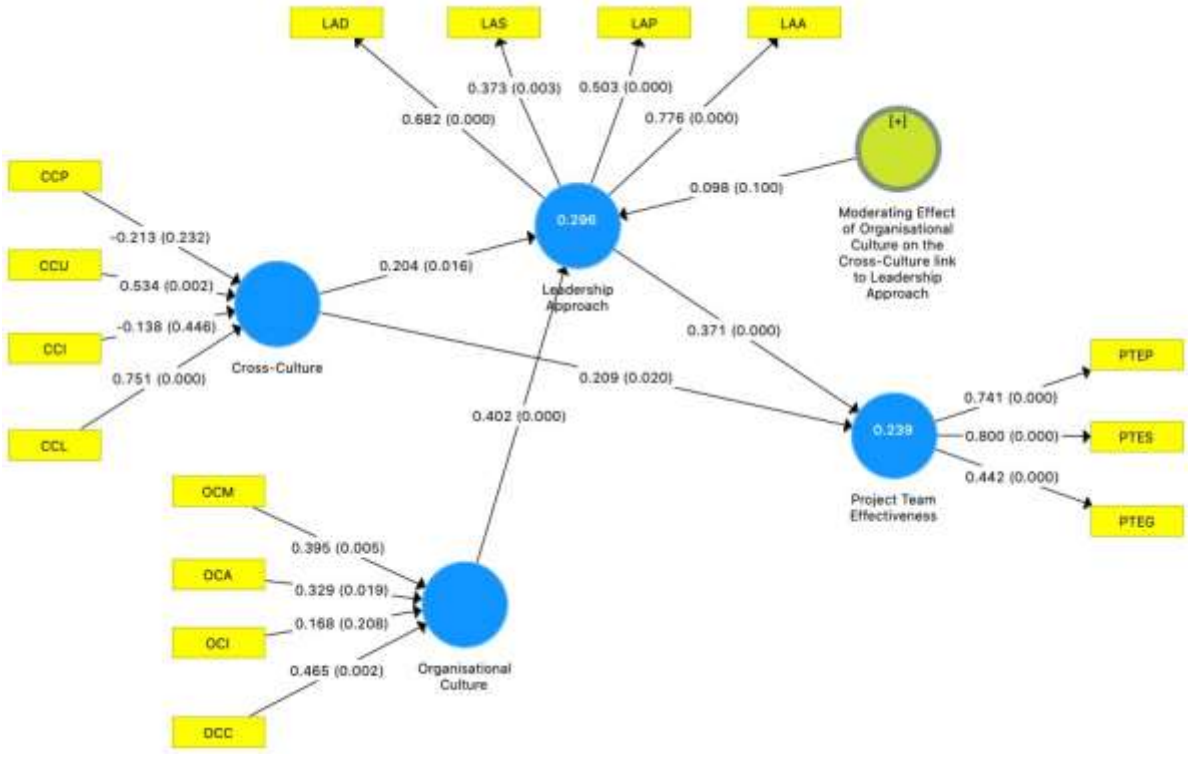
Again, with the mediating effect of leadership in the construct, the impact of CCD on PTE is now statistically significant. Thus, implying that leadership plays a key role in linking cross-culture to the effectiveness of the team. Hence, the project is hinged on the style of leadership. Meaning further, that project success and failure can be explained from leadership perspective. The above discussion has provided strong evidence for for rejecting then null hypothesis (H50), and accepting the alternate hypothesis (H5a).

Hypothesis 6

From H1 through H5, the emphasis was on determining how best to explain the impact of CCD on PTE. In H5, it was possible to determine the important mediating role of leadership in order to improve and define a positive significant connection between CCD and PTE. The project team, leadership and the actualization of project goals and objectives are linked to the organizational culture and determine the shared norms and beliefs within the team. In this section, a new hypothesis is investigated to test the moderating influence of OC on CCD on the mediated relationship defined in H5, and the null hypothesis is stated as follows: *(H60) – There is no significant positive moderating effect of OC on the LA mediated significant positive relationship between CCD and PTE.*

Figure 4.19

SEM Construct for Hypothesis H6



From Figure 4.15, the predictive power of leadership approach under this interaction has improved from 15.8% (H4) and 14.5% (H5) to 29.6%. Earlier in H2, the moderating effect of organizational culture (OC) on cross-culture was investigated and the hypothesis was rejected because there was no evidence to support the position that the moderation relationship positively and significantly influenced PTE.

In H6, the moderating effect of OC on CC in influencing the mediating effect of LA on the relationship between CCD and PTE is approximately 10% (0.098) chance and probabilistically significant at $p = 0.1$, implying a 10% risk of rejecting the null hypothesis and committing a Type I error. However, the rejection of the null hypothesis (H60) in favour of the alternate hypothesis (H6a) is premised on the statistically high significance of cross-culture, project team effectiveness leadership approach and organizational culture in the construct. The high-ranking dimension of each concept in the H6 construct are long-term orientation (CC), consistency (OC), achievement-oriented leadership (LA) and socialising process (PTE). Thus, creating an achievement-oriented project environment of strong team membership integration where team members must adhere to the organizational values, systems, and processes. The integration is further enhanced through a socialising process where the need to improve the mental well-being of members of the team is utmost.

Again, the low significance of the moderating effect of organizational culture moderation on cross-culture imply that both cross-culture and organizational culture are different and distinct cultural beliefs and assumptions that influences the effectiveness of the team. However, the study indicates that the control on project team and leadership is mainly through organizational culture. The improved R^2 value of leadership in H6 compared to H4 and H5, implies that the adopted leadership behaviour has a strong relationship with both forms of cultures.

Unlike the moderating effect of OC on CC on the direct relationship between CC and PTE in H2 that was not statistically significant at $t_{,!} \geq 1.690$, the moderation on the leadership mediating model in H6 is statistically significant at $t_{,!} \geq 1.690$. In the overall one-tailed model in Figure 4.22, it was the moderation on the link to PTE that was statistically significant at $t_{,!} \geq 1.690$. Hence, for the complete model the moderation of OC on CC significantly and positively impacts the effectiveness of the team, and not the leadership. It is important to note that organizational culture ensures that the effect of cross-culture on leadership is moderated, so that the values displayed by leadership is in favour of the organizational culture rather than the team's cross-culture. This also explains why achievement-oriented leadership and directive leadership have substantial and higher presence. This also explains why power-distance and collectivism have negative weights. Power-distance dimension of CC is high, and negatively impacts on the cross-culture. However, the team still works (61% collectively and 39% individually) as suggested in Figure 4.3 earlier, implying the presence of in-group and out-group.

In projects, in-groups are referred to as the core-project team members (Kloppenborg, 2015), who must become part of the decision-making process, and are well suited for the roles they play. This group must be appropriately renumerated and recognised for the job they do. The direct effect of organizational culture on both leadership and project team effectiveness will be tested in hypotheses 7 and 8.

Hypothesis 7

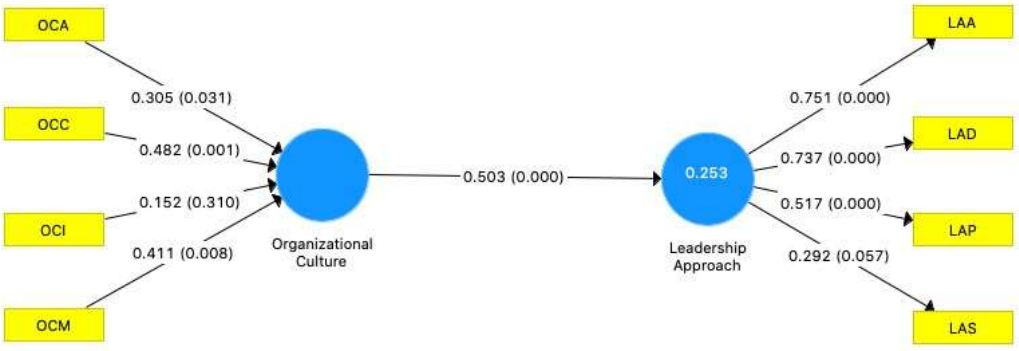
Though, this hypothesis is already tested as part of H6, it is investigated here as a stand-alone effect of OC on LA, and the hull hypothesis is stated as follows: *(H70) - There is no significant positive relationship between OC and LA.* The outcome suggests the presence of a

positively significant connection between OC and LA, hence the null hypothesis (H70) is rejected in favour of the alternate hypothesis (H7a) at a statistical significance of r=0.5 and p<0.01. This finding aligns with previous literature studies on the subject (Xue, 2019), providing further evidence and support. As shown in Figure 4.20, the predictive power of the model on the adopted leadership approach decreased to 25.3% as against 29.6% in H6. Implying that the leadership approach in a the related project setting is influenced by both the cross-cultural dynamics within the project team and the organizational culture.

These factors play an essential role in determining the leadership style and strategies adopted in managing projects. By considering the cultural diversity within the team and aligning with the overarching organizational culture, project leaders can effectively navigate and adapt their leadership approach to achieve project objectives. Recognizing the impact of these dimensions is essential for creating a cohesive and harmonious working environment that supports successful project execution.

Figure 4.20

SEM Construct for Hypothesis H7



In both scenarios, the prediction of the leadership approach is defined mainly by the “consistency (OCC)” dimension of organizational culture which ensures that organization values, systems, and

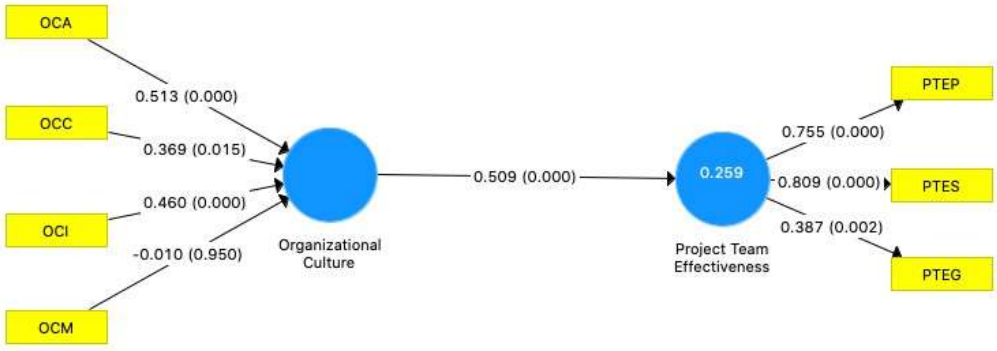
processes in are in place to enhance agreement, coordination, and integration among team members.

Hypothesis 8

This hypothesis is already tested as part of H6, but investigated here as a stand-alone effect of OC on PTE, and the null hypothesis is stated as follows: *(H80) - There is no significant positive relationship between OC and PTE.* The outcome suggests the presence of a positively significant link between OC and PTE, hence the null hypothesis (H80) is rejected in favour of the alternate hypothesis (H8a) at a statistical significance of r=0.5 and p<0.01. As shown in Figure 4.21, the predictive power of the model on the adopted leadership approach decreased to 25.9% as against 30% in H2. Implying that project team effectiveness is dependent on the cross-cultural dimension in the project teams as well as the organizational culture. In both cases, the estimation of team effectiveness is determined by the adaptability dimension of organizational culture, denoted as "OCA." This dimension ensures that team members consistently respond positively to changes in the project process through organizational learning. Hypothesis 8 concludes the testing phase for this thesis.

Figure 4.21

SEM Construct for Hypothesis H8



Conclusions on Hypotheses Testing

The definition of the significance of R-squared values and path coefficients was dependent on both the *t*-statistic and *p*-value. In all cases, the t-statistic was used as final judgement for rejecting or accepting the hypotheses, where $t_{-,!} \geq 1.690$ (Table 4.1, Table 4.2, and Table 4.8).

The alpha level defined for earlier in chapter 3 to reduce Type I error was $\alpha = 0.05$, and the study was conducted at the confidence interval of 95%CI. The analysis indicates that all the estimated path coefficients and R-squared values fell within the two-tailed 95% confidence interval, suggesting statistical significance and reliable predictions.

One significant outcome of the result is the ability of the SEM to corroborate the position in the literature that a high directive leadership environment implies low supportive leadership behaviour (Blanchard et al., 2013; Northouse, 2019). Suggesting that organizations or individuals operating within a highly directive leadership environment might experience a deficiency in supportive leadership practices, which can have implications for employee motivation, satisfaction, and overall organizational effectiveness. The outcome of the hypotheses testing is presented in below.

Table 4.23

Hypotheses Testing Outcome

Hypothesis	Definition		Decision
	Prior Null Hypothesis	Posterior Alternate Hypothesis	
H1	Non-positive, non-significant	Positive, non-significant	Accept H10, Partially reject H1a
H2	Non-positive, non-significant	Positive, non-significant	Accept H20, Partially reject H2a

H3	Non-positive, non-significant	Positive, significant	Reject H30, Accept H3a
H4	Non-positive, non-significant	Positive, significant	Reject H40, Accept H4a
H5	Non-positive, non-significant	Positive, significant	Reject H50, Accept H5a
H6	Non-positive, non-significant	Positive, significant	Reject H60, Accept H6a
H7	Non-positive, non-significant	Positive, significant	Reject H70, Accept H7a
H8	Non-positive, non-significant	Positive, significant	Reject H80, Accept H8a

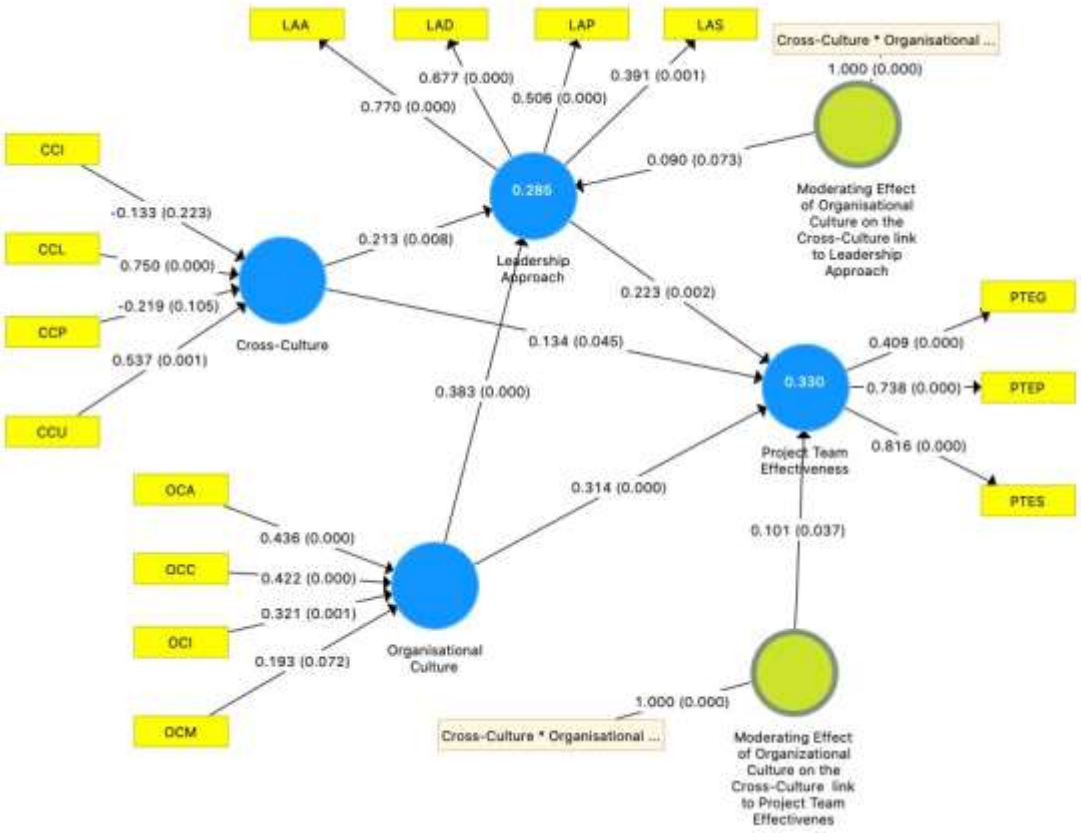
H1 and H2 were rejected because the relationships were not significant as defined earlier. Both hypotheses were designed without a leadership mediating influence. The path coefficients and R-squared values of the hypotheses that included leadership (H3, H4, H5 and H6) were statistically significant at $t_{,!} \geq 1.690$. Also, H7 and H8 were statistically significant because they included organizational culture.

Since the directions of the relations were now ascertained during the hypothesis testing, a one-tailed CI test was performed to enhance the significance of the moderation of cross-culture by organizational culture as presented below. Thus, the cross-cultural hypotheses showed statistical significance solely when associated with leadership. In other words, the influence of cross-cultural factors on team effectiveness was significant only in the context of leadership. Therefore relationship between cross-culture and leadership can be seen in how cross-cultural variables influence leadership styles, and effectiveness across different cultural contexts. This relationship explores the extent to which cross-culture shapes and impacts the leadership behaviour adopted in

projects, emphasizing the importance of understanding cultural nuances and adapting leadership approaches accordingly for effective leadership in diverse environments.

Figure 4.22

One-Tailed SEM Outcome: Improvement of the significance of the moderation effect in a one-tailed test



Consequently, organizational culture moderation on the cross-culture link to leadership is now significant at $t_{).)+} \geq 1.690$ and $p \leq 0.1$. Likewise, organizational culture moderation on the cross-culture link to project team effectiveness link is significant at $t_{).)+} \geq 1.690$ and $p \leq 0.05$. In each moderation scenario, there was approximately 10% chance of detecting a moderation effect. This outcome clearly suggest that whereas organizational culture can significantly influence project team effectiveness, cross culture only achieve this through the mediating role of leadership.

Evaluation of Findings

The findings are evaluated from the perspective of providing insight into how each latent variable influences the project environment through their respective measured variables. The discussion so far shows that the relationships and models examined have provided sufficient evidence to suggests that the four concepts studied are interrelated as either causal or correlational interacting variables. The operationalised typology of the dimensions measured in the survey instrument forms the basis for evaluating the findings. This is also contingent on how the correlation among these dimensions can provide insight into the interacting factors that defines the project environment. Since leadership and team effectiveness are the outcome variables of the study construct, both will be evaluated further as variables that are influenced by cross-culture or organizational-culture. The understanding retrieved from the discussion will lead to the development of ranked project environment variables.

The convergence or divergence between theory and the findings will be evaluated also, and the position of the outcome of the investigation will be evaluated with attendant preferential focus on the industry of measurement. Also, the impact of national culture on the results will be evaluated from both leadership and human resources point of view. Likewise, the effect of organizational culture on cross-culture, leadership and team effectiveness is evident, and will assume a pivotal point of reference as explained in the literature.

Project Leadership

Path-Goal leadership dimensions were adopted based on the rationale discussed in chapter 2 of this thesis, and has been published elsewhere (Umuteme & Adegbite, 2022), with over a 400 read so far. The outcome of the SEM simulation using the data generated for the project environment on the Nigerian oil and gas industry are presented in the Importance-Performance

Map (IPM). The IPM is a unique feature of SmartPLS software for SEM that provide essential information of the role of antecedent constructs as determinants of managerial actions (Ringle & Sarstedt, 2016).

IPM of the construct presents a ranked order of importance on the horizontal axis and a ranked order of performance on the vertical axis. The IPM for leadership approach suggest that the relative influence of cross-culture and organizational culture domains on the adopted ranked leadership approach order in the final study model are 71% and 70%, respectively. However, the values of the total effect of cross-cultural and organizational cultural domains on the leadership approach are 0.21 (21%) and 0.38 (38%), respectively. The total effects of cross-culture and organizational culture on leadership are direct as indicated in the model. In SmartPLS software, the path coefficients represent the direct effects.

From the IPM on leadership approach Figure 4.23, the antecedent constructs have total effects > 0.2 and performance >50% in determining the project leadership behaviour. However, organizational culture provides a greater control in determining the adopted leadership approach. This is because, organizational culture wields significant influence by shaping the norms, values, and beliefs within a organization (Bitsani, 2013; Hatch, 1993; Schein, 2004), thus guiding leaders in their decision-making and team-directed behaviour. By exerting control over the leadership approach, organizational culture ensures that project leaders' actions align with the company's values and norms (Ankrah et al., 2009).

Hence, the predictive power (R^2) of cross-culture and organizational culture presented earlier were 15.9% (hypothesis H4) and 25.3% (hypothesis H7), respectively. Implying that while organizational culture produced 25.3% variance in determining the leadership approach, cross-culture influences the same decision by 15.9%.

Figure 4.23

Effect of Cross-Culture and Organizational on Leadership

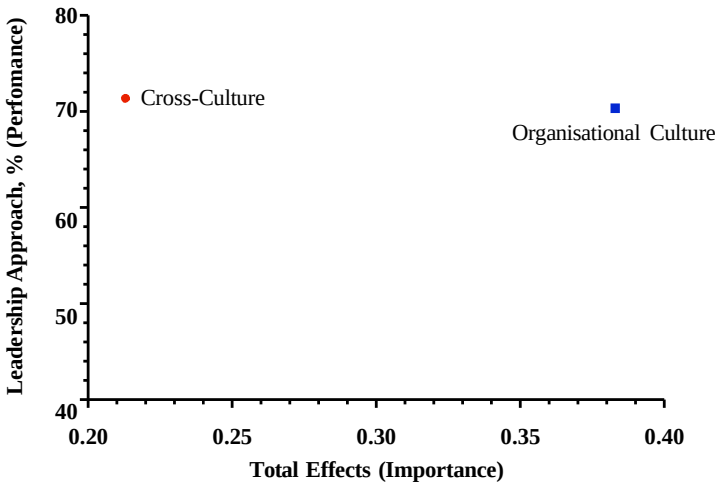
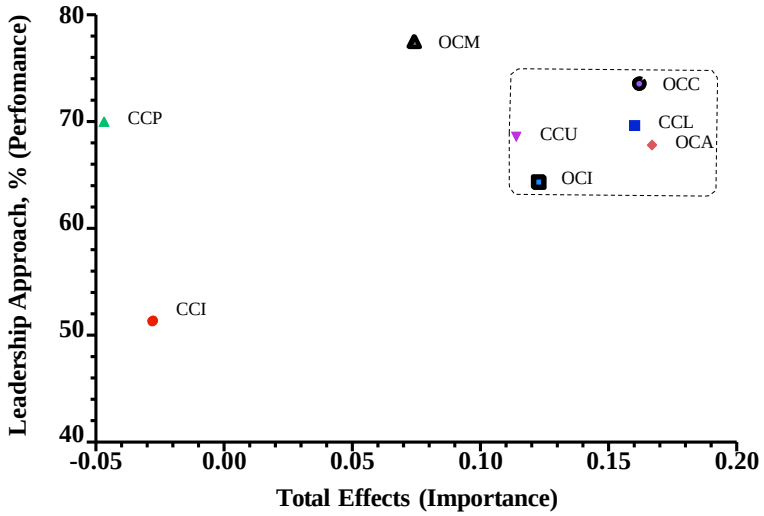


Figure 4.24

Effects of Cross-Culture and Organizational Culture Dimensions on Leadership



For organizational culture in hypothesis H7, the ranked order of predicted preferred leadership behaviour and the loadings is as follows: achievement-oriented LAA (0.751), directive leadership LAD (0.737), participative leadership LAP (0.517) and supportive leadership LAS

(0.292). In contrast, the ranked order of predicted preferred leadership behaviour and the loading from cross-cultural perspective in H4 is as follows: participative leadership LAP (0.631), achievement-oriented leadership LAA (0.620), directive leadership LAD (0.605) and supportive leadership LAS (0.562).

For the final model in Figure 4.22, the leadership approach ranked as follows: achievement-oriented LAA (0.770), directive leadership LAD (0.670), participative leadership LAP (0.506) and supportive leadership LAS (0.351). Implying that the direction of leadership is determined by organizational culture. Since the IPM indicates that organizational culture controls the project leadership behaviour, it implies that underplaying the consequence of not adopting participative and supportive leadership as expected by team members can lead to conflict between the leadership and team members.

In Figure 4.24, the IPM present the individual effects of the dimensions of cross-culture and organizational culture influencing leadership. The box on the top right corner the critical dimensions predicting the leadership approach. Although the survey outcome suggests a large power distance culture, which is consistent with the Nigerian culture (Oruh & Dibia, 2020), the non-significant negative loading of the SEM in Figure 4.22, agrees with literature position that large power distance culture is not favourable for team effectiveness (Oruh & Dibia, 2020). Only the loadings of low uncertainty avoidance CCU (0.537) and long-term orientation CCL (0.750) are statistically significant, as defined earlier. Both dimensions of cross-culture present an adaptability attitude from most of the team members. In the IPM, the importance of CCU and CCL are 0.114 and 0.160, respectively and the corresponding performance indicators are 68.57% and 69.64%, respectively.

Thus, since their performance indicators are relatively the same ($\approx 70\%$), the judgement of the predictive influence of cross-culture on leadership approach is a high level of adaptation to change, which is linked to a large power distance culture (Eylon & Au, 1999; Hofstede, 2011; Kirkman & Shapiro, 2001). This inference is also supported by the mean for CCL in Table 4.14,

which is 3.79 ± 0.81. Thus, with high adaptation to change, work-driven emotional outcome of most team members will be positive towards project success (Prati et al., 2003), as the corporate culture enhances adaptiveness of individual team members (Chamorro-Premuzic & Furnham, 2010).

Again, there is the possibility that the workforce will be highly self-protecting (Globe, 2012), to retain their jobs. The Hofstede's insight website discuused earlier, reports the following cross-cultural values for Nigeria: large power distance, collectivism, neither low nor high uncertainty avoidance, and short-term orientation (normative culture). Aside power distance, these results do not wholly agree with the findings because the survey on the website was not conducted in a project environment defined with strong organizational cultural controls.

Similarly, the statistically significant weightings of organizational culture dimensions in Figure 4.22, ranked as follows: adaptability OCA (0.436), consistency OCC (0.422) and involvement OCI (0.321), while mission (OCM) was the only non-significant indicator. The highest organizational culture performance score of 73.57% is for the consistency (OCC) dimension and with effect score of 0.162; adaptability (OCA) and involvement (OCI) followed with performance and importance scores of 67.86% (0.167) and 64.29% (0.123), respectively. A table of the significant correlations among the important variables with total effect greater than 0.1 in Figure 4.23, is presented in Table 4.24.

Table 4.24

Correlations of Cultural Dimensions and Leadership

Dimensions		Leadership Approach			
		LAA	**LAD**	**LAP**	**LAS**
Cross-Culture	CCU	0.17	-	0.30	0.14
	CCL	0.16	0.24	-	0.19
Organisational Culture	OCC	0.34	0.33	-	-
	OCI	0.23	0.18	0.20	-
	OCA	0.25	0.27	-	0.19

Organizational culture dictates how the workforce will act in a given situation (Kloppenborg, 2015), hence the need for a high presence of directive leadership. This position is corroborated in this research, where consistency, adaptability and involvement cultural domains influence the adopted project leadership style. As evident from the corelation outcome in Table 4.24, the impetus for participative leadership (LAP) was low uncertainty avoidance (CCU) cross-culture in the team, and the "involvement" (OCI) dimension of organizational culture.

Supportive leadership (LAS) was significantly associated with CCU and CCL dimensions of cross-culture and with only the OCA dimension of organizational culture. The fact that LAP and LAS were least ranked in preferred leadership approach suggest that the adopted leadership is mostly influenced by organizational culture domains of consistency (CCC), involvement (CCI) and adaptability (CCA). Adaptability can be enhanced through encouraging social identity and belongingness within the team (Tsai, 2011). The implication of this is a project environment where there is high pressure and high demand for conformity (achievement-oriented and directive leadership), and low empowerment and less freedom to question the leadership hierarchy (low participative leadership) (Eylon & Au, 1999; Kirkman & Shapiro, 2001).

Thus, suggesting that the high adaptation to change by members of the project team in a project environment with higher demand for achievement and directive leadership styles than participative and supportive leadership is driven by the: (i) presence of organizational systems, process and values to enhance integration, coordination, and agreement between team members; (ii) emphasis on consistent response of team members to project change process positively through organizational learning, and (iii) empowerment and continual capability/competency development enabling team members' alignment and engagement in project activities.

The earlier indication of a preferred participative leadership from a cross-cultural perspective is not much of a problem because team members are continuously indoctrinated to adapt to the prevailing culture through the adaptive domain of organizational culture. However, the low loading of 0.351 on supportive leadership (LAS) in the final SEM is a concern based on the operationalised question: *"leadership assist subordinates to overcome problems that stop them from carrying out their tasks."* Hence, a low loading on LAS can imply team members not getting enough support to overcome work-related challenges. This can also explain why the socialising process dimension of team effectiveness, where socialising enhances members' capability to work together interdependently with minimal supervision, ranked highest in the final model. It could also imply a highly experienced team with minimal need for supervision. The influence of both cultural domains on project team effectiveness will be addressed next.

Project Team Effectiveness

Three domains of project team effectiveness were investigated based on the scale developed in the literature (Wageman et al., 2005). The IPM analysis provided further insight into the discussion of the influence of culture on leadership approach. In this section, the mediating role of leadership in the final model is evaluated.

The ranked order of antecedent constructs based on their effect on project team effectiveness is organizational culture, leadership approach and cross-culture. Organizational culture contributed more to the variance in project team effectiveness (R^2=25.9%) as discussed from the outcome of hypothesis H8 (significant at $\alpha \leq 0.05$), leadership (R^2=21.9%) in hypothesis H3 (significant at $\alpha \leq 0.05$) and cross-culture (R^2=12.9%) in hypothesis H1 (non-significant at $\alpha \leq 0.05$).

In Figure 4.25, the box at the top right corner are the critical dimensions predicting project team effectiveness with total effect > 0.1. In the box (Figure 4.26), the only cross-cultural domain with high influence on team effectiveness in the studied project environment is long-term orientation (CCL) with a performance of 70% and importance of 0.136.

Figure 4.25

Effects of Cross-Culture, Leadership Approach and Organizational Culture on Team Effectiveness

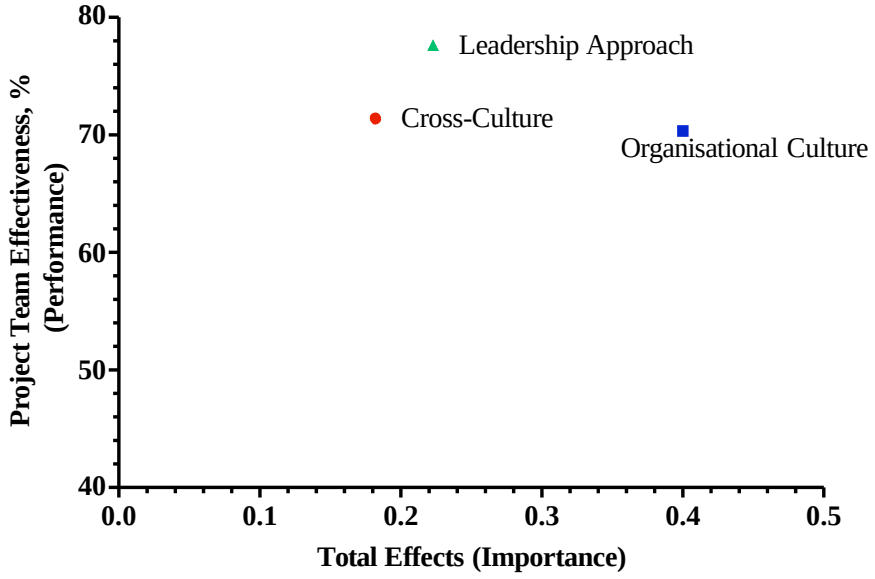
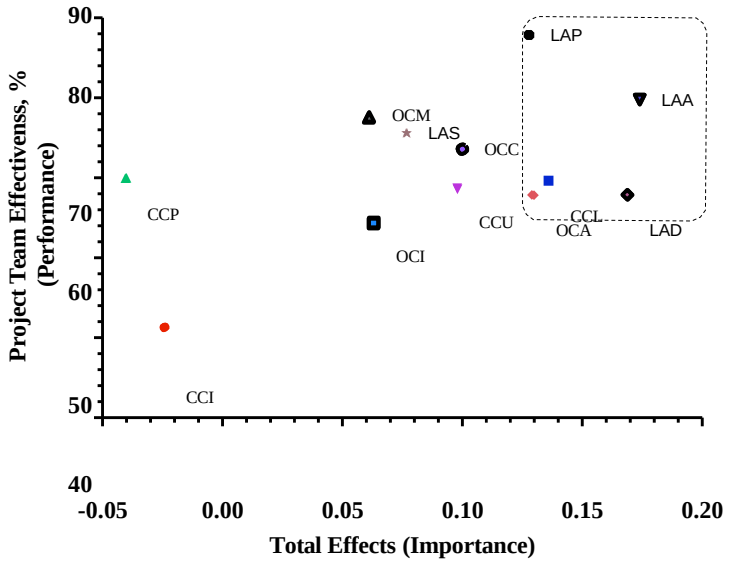


Figure 4.26

Effects of Cross-Culture, Organizational Culture, and Leadership Approach Dimensions on Team Effectiveness



Organizational culture has only adaptability (OCA) with a performance of 68% and importance of 0.129. Leadership approach has achievement-oriented (LAA) performance of 80% and importance of 0.174, directive leadership (LAD) performance of 68% and importance of 0.16, while participative leadership (LAP) performance of 88% and importance of 0.128.

The highest effect of organizational culture (0.4) in Figure 4.25, suggests that the effectiveness of the team is determined by the ranked order of the measured dimensions of organizational culture. In the final SEM, the ranked order of the dimensions of PTE is socialising process (PTES), productive output (PTEP) and group experience (PTEG). The competing performances for PTES, PTEP and PTEG team effectiveness indicators among the dimensions of culture and leadership discussed earlier with effects >0.1 will be observed using a correlations

matrix at $p \leq 0.05$ in Table 4.25, to enhance the business position of the conclusions drawn from the outcome of the investigation, hereafter.

From the correlations table, PTEG is not significantly correlated with any of the dimensions investigated. PTES is mostly determined by adaptability (OCA) dimension of organizational culture, followed by achievement-oriented leadership (LAA), and lastly by long-term orientation dimension of cross-culture.

Table 4.25

Correlations of Culture, Leadership and Team Effectiveness

Dimensions		**Project Team Effectivnessness**		
		PTES	**PTEP**	**PTEG**
Organisational				
Culture	OCA	0.40	0.23	-
Cross-Culture	CCL	0.26	0.24	-
	LAA	0.30	0.40	-
Leadership. Approach	LAD	0.27	-	-
	LAP	0.19	-	-

All the investigated dimensions are positively and significantly associated with PTES. Productive output is driven by LAA, OCA and CCL, in descending order. The results shows that achievement-oriented has the strongest effect on productive output. However, the highest ranking of socialising process is made possible by the participative leadership (LAP). Hence the study suggests that project teams in the industry are effective when an achievement-oriented leadership focus on how socialising within the team through interdependent work-related collaboration can be harnessed to improve productivity.

As stated earlier, the correlations among the dimensions driving team effectiveness suggests that project teams in industry comprises of team members who are resilient and adaptive to change. The understanding discussed so far will provide inputs into the determination of the variables that define the project environment in the section that follows.

Defining the Project Environment

This oil and gas industry is comprised of upstream, midstream, and downstream sectors. This classification dictates the operations of the organizations in the oil and gas supply chain framework (Herkenhoff, 2018). The Nigerian oil and gas industry is a vibrant multimillion dollar industry with huge reserves of oil and gas. However, the high investment risk associated with the industry is attributed to reservoir and product price uncertainties (Dickson, 2019; Haider, 2020; Jahn et al., 2008).

Therefore, it is important to consider the implications of these risks because projects financing in the industry is reliant on price stability of oil and gas, discount rates and internal rate of return, payout period, exchange rates and inflation rates, and other prevailing factors in the global market (Jahn et al., 2008). A major factor influencing the pace of project activities in this industry is the increasing demand for energy globally. With the influence of globalization, organizational and project leadership transverses various cultures and professions, and it is imperative that the investors in the industry must curtail the negative impact of the presence of multicultural dimensions in project teams on project delays and cost overrun. Hence, the focus of this study is in response to the need for a project leadership mediated model that can minimise cross-cultural friction within the team and can improve project team effectiveness for top quartile project delivery and organizational performance. The project environment as implied in this thesis, is comprised of organizational culture, cross-culture, project team effectiveness, and leadership approach.

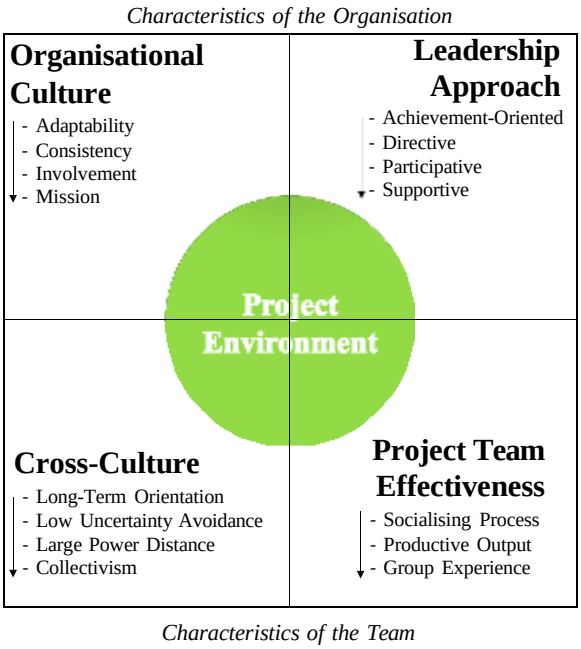
The ranked order of the dimensions for each construct in the final SEM are represented in each quadrant of the proposed project environment. This approach is unique to this research as presented in Figure 4.27, below. Ranking for organizational culture is different from what was

obtained earlier when the project environment was determined from the mean values of the collected data in Figure 4.7, and the correlation network analysis Figure 4.10. The concepts have been classified as either organizational or team oriented.

However, the ranking of the dimensions of leadership approach and project team effectiveness are the identical with the novel correlation approach developed in Figure 4.11 and the network approach in Figure 4.8. The results in Figure 4.27, suggests that the project environment in the oil and gas industry is mostly driven by adaptability, long-term orientation, achievement-oriented leadership, and socialising process. Again, the highly competing loadings of the second ranking dimension in each quadrant suggest that consistency, low-uncertainty avoidance, directive leadership and productive output also influence project success.

Figure 4.27

Order of Presence of the Dimensions of Organizational Culture, Cross-Culture, Project Team Effectiveness and P-G Leadership

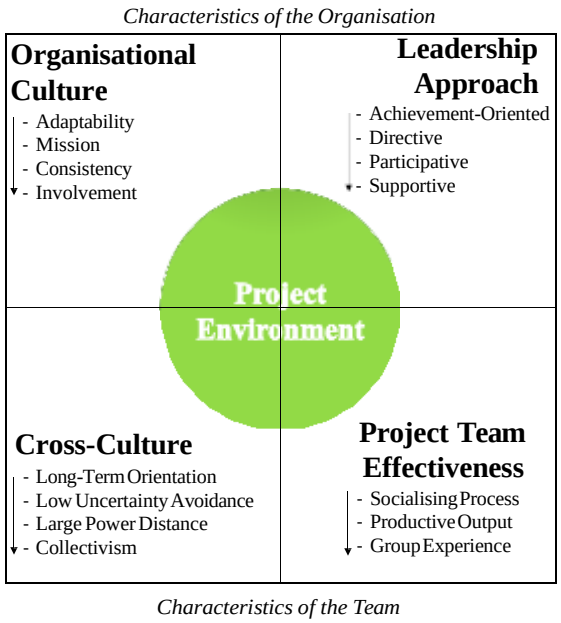


A comparison of the predicted project environments is provided in Figure 4.28, hereafter. The team characteristics are mainly determined by cross-cultural dimensions of low uncertainty avoidance and long-term orientation, and team effectiveness' socialising process and productive output.

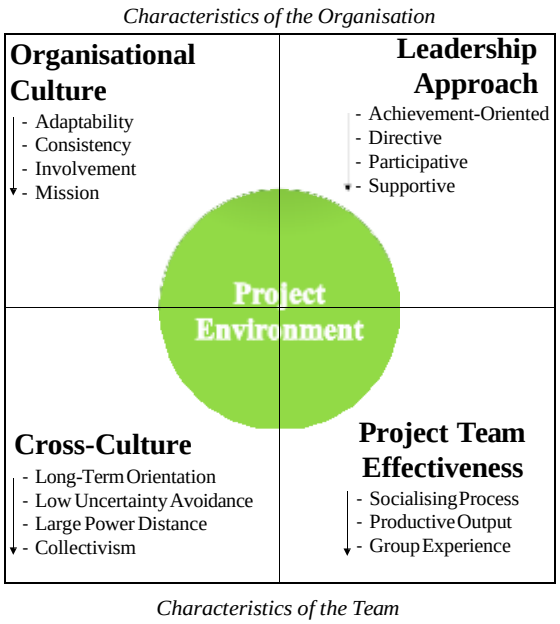
Figure 4.28

Compared Order of Presence of the Dimensions of Organizational Culture, Cross-Culture, Project Team Effectiveness and P-G Leadership

(a) Correlation Network Analysis



(b) SEM Path-Coefficient Analysis



In earlier analysis, "involvement" dimension of organizational culture and participative leadership are also critical to project success. "Group experience" dimension of project team effectiveness was not significantly correlated with the drive of project success in Figure 4.27, just as power distance (CCP) and individualism/collectiveness (CCI) were also non-significant loadings of cross-culture. From the project environment quadrants above, the characteristics of the organization are defined by leadership in the following order: LAA $\longrightarrow$ LAD $\longrightarrow$ LAP $\longrightarrow$ LAS. The

organizational culture's level of activity can be ranked by its adaptability, consistency, and involvement dimensions. In other words, the ability of team members to adapt to change, and maintain coherence and stability, can be used as criteria to evaluate the overall level of team's activity withi the project environment.

The re-assessment of the project environment using the SEM changed the ranking orders of the dimensions as compared below. Ontology is the representation of reality with all certainty (Saunders et al., 2019), hence the need to measure the effect of all contributing factors to team effectiveness simultaneously using SEM. This understanding guided the various approach employed to carefully study the underlying factors influencing project success. Accordingly, the prediction of the project environment was improved in the SEM through the roles of mediation by leadership and moderation by organizational culture on cross-culture. Hence, the SEM provided the best certainty of predicting the reality of the interactions among the concepts studied.

Proposed Team Effectiveness Model

From the IPM analysis discussed earlier, the study proposes two leadership mediated culturally driven project team effectiveness models. In this PhD work, both models were investigated, and it is demonstrated that the direction of organizational culture on leadership and team effectiveness was proactive while that of cross-culture is active. The direction of relationship in both models have been assumed from the directions of the path coefficients in the final SEM result. Culture assumes a significant role in the proposed models by defining the leadership approach and regulating the effectiveness of the team. In each vertex of the triangles, the resulting ranking of the dimensions/factors of each concept influencing the project environment have been provided. From the discussions and explanations provided earlier, the summarised roles of each concept in the construct are provided inside the models.

The classification of the effect or importance of each construct as discussed earlier are based on the suggestions in the literature (Ringle & Sarstedt, 2016). The understanding of effect in the proposed models is the general capacity of the predictor to transmit changes in the outcome (Pearl, 2012). Hence, the effects are related to the classification for the coefficient of determination (R^2) in the literature (Hair et al., 2017), discussed earlier. The purpose of the hypotheses presented and tested was to ascertain if a relationship existed and the directionality, which are recommended perquisites before conducting the SEM (Kline, 2012). The fact that both cross-culture and organizational cultures are composite constructs determined by formative indicators, enhances the predictive nature in the team effectiveness models. Therefore, it is possible to understand how leadership mediation influences cultural predictions when both models are compared as I have done here. The leadership mediation path: *culture → leadership approach → team effectiveness,* assumes that leadership approach is also a "cause" of project team effectiveness.

Implying that the adopted leadership approach is also a reflection of the expected output from the team. Whereas cross-cultural effects can vary from project to project in the same organization, organizational culture dimensions are not controlled by the project and can be assumed as *exogenous*. For the reflective models, the factors are *endogenous* and each dimension is assumed as exclusive (Kline, 2012). This assumption is critical to the conclusions derived from the predictions of the study SEM and forms the framework for ranking the dimensions in the proposed models in Figure 4.29 and Figure 4.30. Further implication of the representation in Figure 4.30, suggest a reactive-adaptive approach to work by the team members under cross-cultural influence. Thus, the leadership applies the needed control though the norm(s) derived from the organizational culture in responding to the ranking response of team effectiveness dimensions to enhance productivity. The response of achievement-oriented leadership is linked to the ranked

order of organizational cultural influence of empowerment, defining competency requirement, clearly defining the goals and vision, enforcing the organizational beliefs and assumptions, and defining the change process. While the reactive response by the cross-culture is that team members must focus on the horizon and adapt to the project environment established by the leadership, because of the associated gains defined by the organizational culture.

Hence, the team effectiveness model where the exogenous attribute of organizational culture establishes the framework for the leadership and expected team effectiveness has been presented, first in Figure 4.29, and followed by the reactive team effectives model Figure 4.30. Hence both models are here and uniquely referred to as *Proactive* and *Reactive* team effectiveness models, respectively. PLS-SEM was developed for predictive purpose (Hair et al., 2017), hence the diagram below is predictive of the organizational concepts that control the project environment

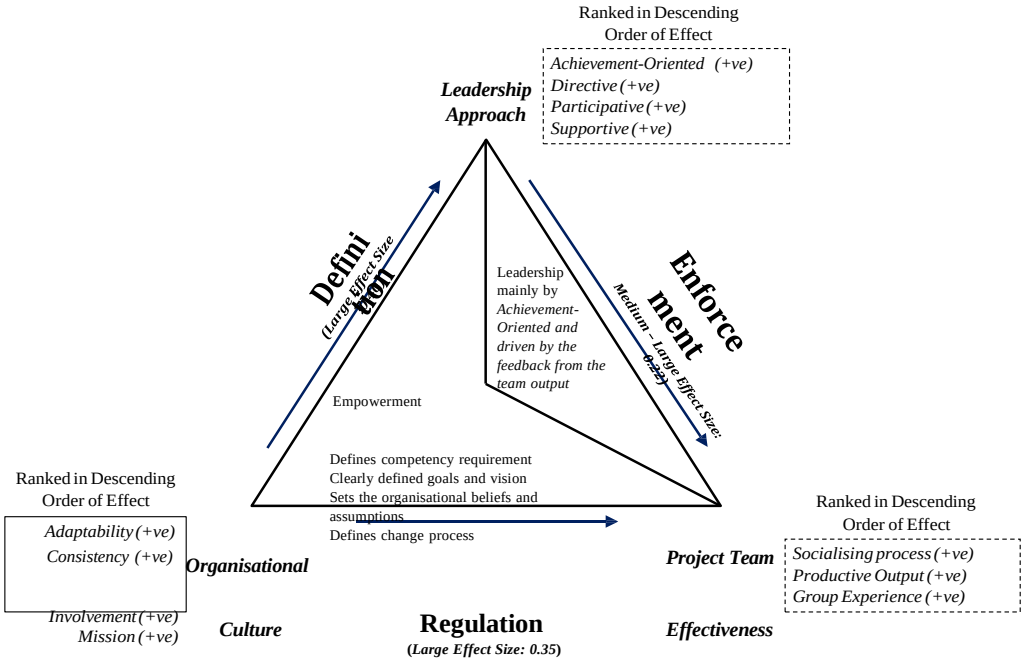
in both proactive and reactive modes. The effects sizes ($f^!$) were retrieved from the results of the simulation, as defined in the literature (Cohen, 1988; Hair et al., 2017).

$$f^! = \frac{R_{./012343}{}^! - R_{4\$012343}{}^!}{1 - R_{./012343}{}^!} \quad (4.1)$$

where $R_{./012343}{}^!$ is the variance explained by included the latent variable and $R_{4\$012343}{}^!$ is the variance explained by including the latent variable. From a predictive perspective, the effect sizes in Figure 4.29 and Figure 4.30, suggests that organizational culture imposes larger effect sizes on the definition of the project team effectiveness and leadership approach.

Figure 4.29

Proactive Team Effectiveness Model

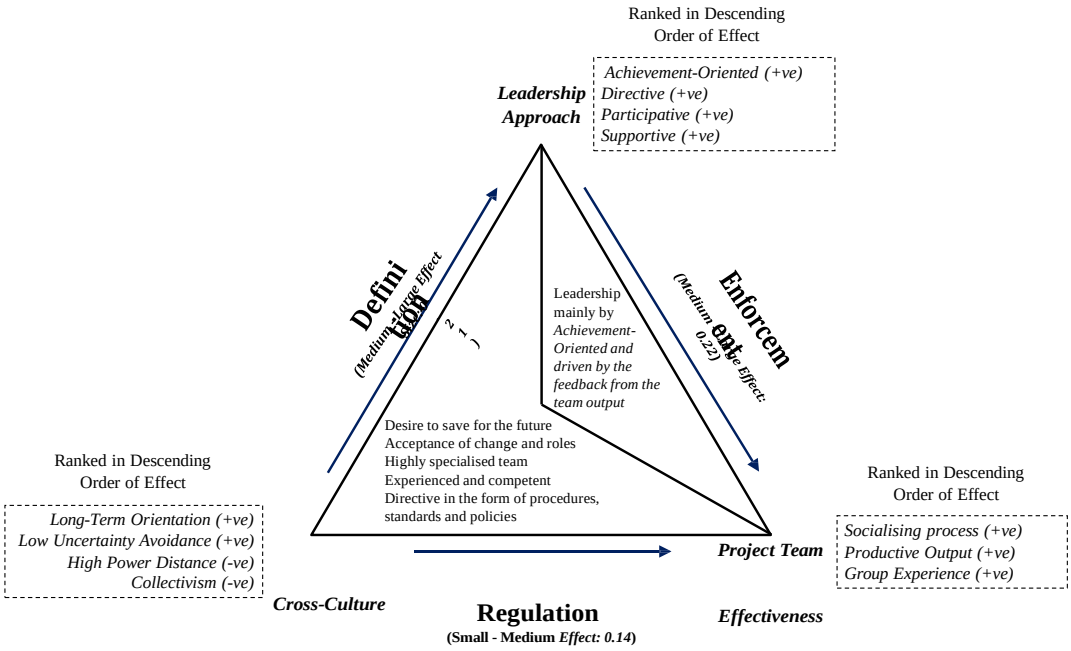


The *reactive* nature of cross-cultural influence on project team effectiveness is supported from hypothesis H1, where the relationship was not statistically significant, and only became significant under leadership mediation in hypothesis H5.

The influence of organizational culture as an exogenous construct is *proactive* on project team effectiveness because the direct link investigated in hypothesis H8 was statistically highly significant and positive When compared with cross-culture, a medium-large effect on leadership and small-medium effect size on project team effectiveness was observed. Thus, since the second model is reactive there should be some concern of overwork and burnout among team members from a psychological perspective. This is because members of the team can be coerced through acievement0oreinetd leadership behaviour to adapt to the organizational culture, as observed from the long-term orientation (CCL) and low uncertainty avoidance weighting. Project uncertainties are internally generated by the leadership, hence the path to project team effectiveness is driven by the leadership with the same effect size for both cultures.

Figure 4.30

Reactive Team Effectiveness Model



This position is equally corroborated by the results of the empirical study in the literature (Prati et al., 2003), where the authors suggests that the project leader motivates the team toward the collective action, and equally creates work environment that encourages both task and social bonding among team members. The motivational project leader role espoused in the literature aligns with the P-G leadership characteristics. Therefore, it can be said that the existence of all the interacting variables of organizational culture and leadership in the construct have undermined the effect of cross-culture in the team with a capacity to influence the effectiveness of the team. Achievement-oriented leadership is supported in the literature as a driving force behind high performance teams (Katzenbach & Smith, 1993). During the sample size determination in chapter 3, the effect size of 0.15 was chosen and a statistical power of 0.8, instead of a conservative

medium value of 0.3 that is usually taken in research studies (Cohen et al., 2003). This approach was able to increase the significance of the predictions.

The R-squared values indicates that 33% of the variance in PTE was predicted by cross-culture, leadership approach and organizational culture, where the remainder 67% would be associated with other internal and external factors, such as government regulation, corporate social responsibility, inflation etc., which are beyond the control of the project team leadership. Hence, a 33% variance in team effectiveness implies that if other factors that can hinder project success are attended to, the failure of projects can occur when there is negligence on the impact of cross-culture, leadership, and organizational culture. Earlier, the results in hypothesis H1 indicates that cross-culture was unable to directly influence project team effectiveness significantly though a positive relationship existed, until the relationship was mediated by leadership approach. The change in the ranking position in organizational culture in the SEM predicted project environment variables (Figure 4.28b), is because organizational culture performs a dual role of been a moderator of cross-culture and a mediator between LA and PTE.

Therefore, findings of this research suggests that the main driving concept in the Nigerian oil and gas industry is the culture of the organization. Therefore, the 3 novel propositions based on the outcome of the research are stated as follows: (1) Project achievement in the industry is highly determined by an organizational culture that clarifies the project goals and vision, defines the change process, and sets the beliefs and assumptions that are operative within the team; (2) The influence of cross-culture on team effectiveness is positively significant only under leadership mediation; and (3) The impact of cross-culture in the team on success of a project is undermined by the high influence of the organizational culture in the industry.

Summary

The results and discussions presented in this chapter have produced a set of information that will be summarised in this section. The study was conducted to study the relatedness of cross-culture, organizational culture, project team effectiveness, and leadership approach, in defining and describing a typical project activities' setting in the oil and gas industry in Nigeria. 210 workers who are aged within 30 to 60 years were recruited with a blind selection process where the researcher had no influence. This was because of the inclusion criteria and the difficulty of accessing the actual number of project workers in the industry of study. This number was estimated using the 80% effect power criterion recommended in the literature (Cohen, 1988; Cohen et al., 2003) at alpha (α) level of 0.05 and different effect sizes of 0.15, 0.25 and 0.35. The minimum effect size of 0.15 returned a maximum sample size of 190 participants and was adopted as able to measure the smallest effect of the predictor variables on the response variables through the data retrieved in the current study.

The recruiting of participants was through a blind selection process where the researcher had no influence because of the ontological need to represent reality by having only those with the relevant project experience in the industry. The main inclusion criterion is that participants must have at least one year of experience in project activities in the oil and gas industry. Those with less than one year of experience in project activities in the oil and gas industry were not included. This was done to ensure the participants have the required experience to understand project dynamics. Therefore, the field data were collected cross-sectionally from 230 participants, with 210 returned questionaries for the data analysis.

This summary to chapter 4 presents the trustworthiness of the results, which includes reliability and validity tests of the structural equation model used to develop the simulated model.

This is followed by the outcome of the descriptive statistical analysis. Next is a summary of the hypotheses' tests conducted. Finally, is an evaluation of the findings leading to the development of the project environment and proposed proactive and reactive team effectiveness models unique to this PhD research.

Trustworthiness of Results

A quantitative research method has been adopted as best fit for this study because of the specific needs of the research: (i) causal relationship and correlational study, (ii) retrieve data from large number of participants, (iii) develop structural equation model, and (iv) draw inference by deduction. The credibility of the data for analysis was ensured by comparing the data entered in SPSS with the raw field data by two independent individuals not associated with the study. Transferability of personal emotional attachment to the study was achieved by ensuring the questions in the survey instruments are related to the experience of the participants. The conformability of the study results to approved research practice was achieved through reliability and validity checks on the SEM as discussed further.

Reliability and Validity of Measurement Models

Reflective Models

Two reflective models - leadership approach and project team effectiveness, were investigated in the SEM. The validity and reliability assessment outcome suggests that the reflective measurement models are valid and well suited for the current study. Cronbach alpha reliability criteria returned 0.42 for both reflective models. Despite this unacceptable Cronbach alpha value, the indicators were still left because they are validated theoretical measures and have not been developed to be used as confirmatory factors. The use in this research, is based on the need to rank their presence in project activities in the oil and gas industry. Consequently, the more

generous composite reliability check metric was used instead, and the model passed validity. The average variance extracted (AVE) estimated from the model was lower by 0.13 for leadership approach and 0.04 for project team effectiveness, based on a minimum value of 0.5. However, the AVE estimates did not affect the acceptance of the models because of support from the literature that since the composite reliability value was more than 0.6, the models are valid. Another support for the validity of both models was the estimated heterotrait-monotrait ratio (HTMT) value, which fulfilled the accepted criteria in the literature for constructs that are similar in concept. Next, is to assess the validity of the formative measurement models, which include cross-culture and organizational culture.

Formative Models

The formative indicators have been retained on theoretical basis, and the purpose of the models have been fulfilled as able to indicate the cross-cultural and organizational culture dynamics during projects execution. The analysis set forth can aid in project audits to understand how the variables rank in relatively. The VIF for all weightings and loadings were less that 3, and the standardized outer weights for all formative indicators are "+1." Accordingly, both criteria have been fulfilled. Therefore, the formative models are also valid for the SEM

Structural Model

The use of fit indices for PLS-SEM is still on the formative stage, especially for models that incorporate both formative and reflective measurement models. The R-squared values of the regression estimates are statistically significant and greater than the theoretical value of 0.25 used in estimating the sample size in chapter 3. All the latent variables correlations in the final SEM are statistically highly significant at $p \leq 0.01$. Except for OC moderation of the relationship between CCD and LA with a *p*-value of 0.13, the path coefficients are statistically significant at $p \leq 0.01$,

and significant at $p \leq 0.10$ for organizational culture moderation ($t \geq 1.690$) on the link between CCD and PTE. The aim was to create a model capable of understanding issues influencing project success and delivery concerning cross-cultural factors, considering the influence of OC on LA and project team norms. Thus, the SEM developed in this thesis has achieved the aim of this research.

Descriptive Analysis

The data collection survey returned 210 questionnaires out of 230 (91%) with all sections filled and no outlier. Thus, the response was more than the calculated sample size and is suitable for the study. Demographic details of the participants were collected although they are not the main criteria needed to develop the leadership model. The age band of participants are as follows: 30-35(56), 36-40(106), 41-45(12), 46-50(25) and above 50(11), given an average team age band of 36-40. The participants are all Nigerians - 31 were females (15%) while 179 were males (85%). Educational level of the participants is as follows Diploma (4), Degree/HND (201), Master (3) and Doctorate (2), suggesting a highly educated team. This outcome is corroborated by the data retieved from the Nigerian Content Development and Monitoring Board (NCDMB, n.d.), where 70% of the workforce fall within the 21-40 age bracket, and 81% male to 19% female. Literature evidence suggests that the workforce comprises 98% Nigerians and 2% expatriates (NCDMB, n.d.), supporting the rationale for selecting only Nigerian respondents.

Although, the researcher have 11 years of projects experience in this industry, there was no personal interference with the outcome of the study to sustain objectivity. The entire study is guided by the Unicaf University in Zambia ethical guidelines and codes of conduct. The indication from the descriptive analysis suggests that the indicators measured are directly related to the purpose of the study. The outcome suggest that a high percentage of the responses agrees with the position stated by the questions in the questionnaire. A project environment model was initially

developed based solely on the descriptive information provided by the mean score without structural interactions among the variables. This model was further evaluated after the correlational study.

Measure of Relationship

The correlation matrix of the fifteen indicators formed 105 correlations, out of which 57 (54%) were statistically significant. Correlation values, $r \geq 0.3$, were obtained for 16 statistically significant inter-indicator correlations, while 41 statistically significant inter-indicator correlations were less than 0.3. Out of the 57 significantly correlated variables, 35 had a *p*-value less than 0.001, indicating highly significant correlations. Based on the classification in the literature (Cohen, 1988), the statistically significant corelations were of low to medium effect, which is satisfactory for this research, being able to provide insight into the dimensions influencing project delays and loss of revenue. Correlational studies and mapping were achieved through normal network analysis using JASP® software (Team, 2020), and a plotting approach unique to this thesis. Centrality measures defines the strength of the relations. Higher centrality measures determine the nodes that are central to the network, and these nodes are the dimensions defining the success of the project.

Generally, the centrality tests measure the estimates of the distance between the nodes. The node with increasing short distances passing through is higher in preference. The correlational network analysis suggested the following order for the measured dimensions for the concepts defining the project environment, as follows: Project team effectiveness (socialising process and productive output); Organizational culture (adaptability, mission, consistency, and involvement); Leadership approach (achievement-oriented and directive leadership); and cross-culture (long-term orientation). The results suggests that adaptability drives the organizational culture under correlational interaction.

The ideal scenario in projects is a correlational interaction, hence, the order predicted was reasonable at this stage, and more ideal than that predicted using the mean values of each measured variable. However, this order was equally verified from the SEM, which presents a closer interaction based on both mediation and moderation effects, which represents the conceptual/theoretical framework adeveloped in this work.

Hypotheses Testing

The analysis of the numerical values of the path coefficients and R-squared values relies on both the *t*-statistic and *p*-value. In all cases, the t-statistic was used as final judgement for rejecting or accepting the hypotheses, where $t_{',!} \geq 1.690$. The alpha level defined to reduce Type I error was $\alpha = 0.05$, and the study was conducted at the confidence interval of 95%CI. The analysis shows that all the predicted path coefficients and R-squared values were within two-tailed 95%CI. Hypotheses H1 and H2 were rejected because the relationship was not significant as defined earlier. Both hypotheses were designed without a leadership mediating influence. The path coefficients and R-squared values of the hypotheses that included leadership (H3, H4, H5 and H6) were statistically significant at $t_{',!} \geq 1.690$. Also, H7 and H8 were statistically significant because they included organizational culture. Consequently, the hypotheses that included cross-culture were only statistically significant when linked to leadership. Since the directions of the relations were anow ascertained during the hypothesis testing, a one-tailed CI test was performed to enhance the significance of moderation of cross-culture by organizational culture.

Thus, moderation effect of cross-culture to leadership link is now significant at $t_{).)+} \geq 1.690$, $p \leq 0.1$ for leadership and the moderation effect of cross-culture to project team effectiveness link is now significant at $t_{).)+} \geq 1.690$, $p \leq 0.05$. In each moderation scenario, there

was approximately 10% chance of detecting a moderation effect. This clearly suggest that whereas organizational culture can significantly influence project team effectiveness, cross-culture only achieve this through the mediating role of leadership. The findings of the analysis signify that the complete presence of OC and LA variables in the construct can diminish the influence of cross-cultural factors within the team.

Project Environment Framework

The outcome of the evaluation carried out using the importance-performance map (IPM) explained exhaustively elsewhere (Ringle & Sarstedt, 2016), led to the development of a realistic project environment framework that defines the controlling variables in a project. From the project environment quadrants developed, the characteristics of the organization are defined by leadership in the following order: $\mathrm{LAA} \rightarrow \mathrm{LAD} \rightarrow \mathrm{LAP} \rightarrow \mathrm{LAS}.$ The activeness of organizational culture is in the order of adaptability, consistency, and involvement dimensions. The team characteristics are mainly determined by cross-cultural dimensionsal variables of long-term orientation and low uncertainty avoidance, and team effectiveness' socialising process and productive output. Hence the study suggests that project teams in the industry are effective when an achievement-oriented leadership focuses on how socialising among team members can be harnessed for interdependent roles to improve productivity. The prediction of the project environment was improved in the SEM through the roles of mediation by leadership and moderation by organizational culture on cross- culture. Hence, the SEM provided the best certainty of predicting the reality of the interactions among the concepts.

Team Effectiveness Models

Two separate models of team effectiveness were equally developed from the SEM. A proactive project team effectiveness model has organizational culture as the main predictor, while

the reactive project team effectiveness model has cross-culture as the predictor variable; In both models, the leadership mediation path is *culture → leadership approach → team effectiveness*. Implying that the adopted leadership approach is also a reflection of the expected output from the team, which is equally corroborated in the literature (Northouse, 2019; Walumbwa et al., 2008; Yukl, 2013).

Organizational culture dimensions are not controlled by the project and were assumed as exogenous. Each dimension of the reflective models – leadership approach and project team effectiveness, were treated as a unique domain because they are endogenous in nature as suggested in the literature (Kline, 2012). This assumption is critical to the conclusions derived from the predictions of the study SEM and forms the framework for ranking the dimensions in both models. The influence of organizational culture as an exogenous construct is *proactive* on project team effectiveness because the direct link investigated in hypothesis H8 was statistically highly significant and positive. From a predictive perspective, the effect sizes suggests that organizational culture enforces large effect sizes on the definition of the leadership approach and project team effectiveness when compared with cross-culture with medium-large effect on leadership and small-medium effect size on project team effectiveness. Since project uncertainties are mainly generated internally by the leadership (Prati et al., 2003), the path to project team effectiveness is driven by the leadership with the same effect size for both organizational culture and cross-culture. The dimensions in both models were ranked from the results of the SEM.

CHAPTER 5: IMPLICATIONS, RECOMMENDATIONS, AND CONCLUSIONS

This research investigates path-goal leadership approach mediation on the cause-effect link between cross-culture in project teams and the effectiveness of the team, with organizational culture moderation of cross-culture's effect. The rationale for the adopted theoretical constructs was aimed at enhancing the people-driven interactions that defines the project environment. A quantitative research methodology was utilized, aligning with positivist philosophical epistemological perspectives. The sample size of 210 participants was determined based on the need to improve the predictions of the structural equation model, and to prevent both Type I and type II errors. Accordingly, an alpha level of 0.05 was adopted to prevent Type I error, where the null hypothesis is accepted instead of being rejected.

Cohen (1988), had suggested that a statistical power value of 80 percent or more represents an adequate in social science research. Hence, the investigation was based on a statistical power of 80%. The survey instrument is comprised of 15 closed-ended 5-level Linkert scaled questions that represents the dimensions of the concepts in theoretical framework. A cross-sectional survey horizon was adopted because it was assumed that the responses will not change over time. The operationalizations of the measured variables were drawn from the definitions of each dimension of the studied organizational concepts. A multi-stage investigative approach was adopted during the data analysis to reveal the causal and correlational relationship among the dimensions of organizational culture, cross-culture, project team and leadership, and the causal relationship between these four concepts. The principal aim was to study the complex interrelatedness of the research latent variables: organizational culture, cross-culture, team effectiveness, and leadership behaviour in a project environment to enhance organizational performance in the Nigerian oil and

gas industry. All ethical considerations recommended by the Unicaf University in Zambia Research Ethics Committee (UREC) were implemented.

The analysis and model development technique adopted structural equation modelling. There are two approaches to SEM analyses technique in the literature, including the covariance-based SEM (CB-SEM) and partial least square SEM (PLS-SEM). The rationale for adopting PLS-SEM was critically assessed in chapter 3. Approach to ascertaining the quality of the SEM has been presented in chapter 4. Hypothesis testing and inference were based on the measures recommended in the literature (Cohen, 1988; Hair et al., 2017). Both formative and reflective constructs have been adopted, as discussed extensively in chapter 4. This chapter present the implication of this study, followed by the recommendations for application and a conclusion section.

Implications of Research

The criteria assessed in this section as detailed in the literature (Easterby-Smith et al., 2015) include: theory robustness, implications for practice, coherence between data and arguments put forward, and the relevance of the knowledge gained from the study for project execution in the industry. From a positivist philosophical perspective, the study investigated the direct cause-effect link between CCD and PTE, and the mediated influence of Path-Goal leadership on this relationship, and the role of organizational culture moderation on cross culture and how this affects the relationship of CCD with LA and PTE. The overall aim is to suggest an agenda that can support or negate the *status quo* on how project teams are engaged by the existing leadership culture. The critical implications that are obvious from the study are disused further as follows:

Implication for Research Question 1

The first research question is stated as follows - RQ1: *What is the direct impact of cross-cultural dimensions in a project team on project team effectiveness in the oil and gas industry in Nigeria?* This question was answered in hypothesis H1. While a direct positive link between CCD and PTE was evident, it lacked statistical significance at α=0.05. The direct relationship between CCD and PTE yielded a *p*-value of 0.238, indicating non-significance. Also, in the SEM structure for hypothesis H1, all the dimensional variables of both concepts were not significant at α=0.05. The outcome of the observed correlations between the measured variables of CCD and PTE are summarised as follows: (i) Low uncertainty avoidance cross-culture was positively and significantly corelated with socialising process in team effectiveness.; (ii) Individualism cross- culture was negatively and significantly correlated with productive output dimension of team effectiveness; (iii) Long-term orientation cross-culture was positively and significantly correlated with both productive output and socialising process dimensions of team effectiveness; and (iv) None of the measured variables of cross-culture has significant correlation with the "group experience" dimension of team effectiveness.

The outcome above has strong implications in enhancing productivity as discussed further, as follows. Firstly, low uncertainty avoidance implies that the adopted leadership style is appropriate, and adapted to the work situation (Geletkanycz, 1997). This highlights the importance of clarifying roles and responsibilities, emphasizing the prevalence of achievement-oriented and directive leadership styles, as elaborated in detail in chapter 4. A positive correlation of low uncertainty avoidance with socialising process dimension of team effectiveness accentuates the need to enhance team-interdependent work-related interactions between team members. To improve interdependency, the leadership must create teamwork norms that all team members must

adopt (Hoegl et al., 2004; Newton, 2008; Wakefield et al., 2008). Again, this becomes a negation of independent association within the team. However, the approach can improve the overall team's competence, thus enhancing the readiness of team members to take more roles within the team. Since teamwork is enhanced with minimal supervisions (Willcoxson & Millett, 2000), as a positive effect of the socialising process, the tendency of achieving top-quartile team performance is also high.

Secondly, a negative significant correlation of individualism and productive output from the study was possible because the data indicates a comparative presence of 61% individualism and 39% collectivism cross-culture. The implication from this outcome suggests the need for improved collective engagement of team members by the leadership to enhance productivity. In projects where high professionalism is expected, the drive for individualism cross-culture is expected. However, this can impact negatively on the work progress when other team members perceive that some members of the team possesses privileged information that enhances their performance (Atesmen, 2015). Consequently, project team leadership must provide the avenue for collectivism culture to thrive by strengthening interdependent work culture where younger team members in the same profession are mentored by older staff.

Thirdly, a positive correlation between long-term orientation cross-culture and productive output is encouraging because it suggests that most of the team members are willing to stay till the end of the project. This kind of outcome can reduce employee turnover rate and provide the needed sustained experience and competence within the team. Another positive correlation with socialising process buttresses the fact that a team where independency among the members enhances professionalism and productivity is important for top-quartile performance. Humans thrive for belonginess according to Maslow's hierarchy of needs (Turner, 2009), hence the need

for the socialising process in teams is emphasised here. Therefore, members of a team without a defined socialising process will tend towards individualist culture. To avoid this, the project team leader must create the workplace that encourages collective teamwork, which can improve the continuous willingness of team members to adapt to the norms of the workplace, while sustaining productivity. A collectivism-driven workplace encourages the reward of team's output rather than individual's effort. However, to prevent social loafing, the individual's contribution to the productivity of the team must be recognised at the team's level.

Implication for Research Question 2

Thsecond research question is stated as follows, RQ2: *How does the moderating role of organizational culture influence the leadership mediated impact of the dimensional variables cross-cultural on project team effectiveness*. This question was answered in hypothesis H2. The outcome suggests that the moderating effect of organizational culture on cross-culture was not significant.

Nevertheless, a direct cause-and-effect connection was evident between OC and PTE, despite the lack of a statistically significant direct link between CCD and PTE at $\alpha = 0.05$. In the earlier analysis of RQ1, the study indicated that none of the measured variables relating to CCD and PTE showed significance in the direct relationship between CCD and PTE.

Conversely, the measured variables of project team effectiveness were highly significant under the direct relationship with organizational culture. Thus, suggesting that the controlling culture in projects is organizational culture. Consequently, there is a high need for every team member to adapt to the norms and codes of conduct enforced by the organization. Accordingly, the loading of the significant measured dimensions of organizational culture under this SEM scenario are in the following descending order: Adaptability (51.4%, $p = 0.0000$), Involvement

(45.7%, p = 0.0010) and Consistency (36.8%, p = 0.009). Also, the loadings of the study dimensional variables of PTE are as follows in descending order: Socialising process (81.3%, p = 0.0000), Productive output (74.9%, p = 0.0000), and Group experience (39.2%, p = 0.0001). The resulting R-Squared value of the direct link of OC on PTE is 25.9% from hypothesis H8.

However, this was improved in hypothesis H2 to 30%. Thus, the additional 4.1% variance in project team effectiveness is caused by the determining dimensions of cross-culture. However, the "mission" dimension of organizational culture which defines the objectives and goals was not significant as a contributor to the norms determining project success. This is understood as projects alone do not determine the business objectives and goals of the oil and gas industry. What is mostly key is the ability to produce more oil and gas for sale. The question asked was "goals and objectives are clearly defined, and team members understand the vision of the organization." From here, the low and insignificant weighting of "mission" suggests that not all team members care to understand the vision of the organization.

This implication can be linked to the preference for achievement-driven and directive leadership while giving less attention to participative and supportive leadership. Hence, by implementing a CCL cross-culture, team members work to earn wages through adaptive work behaviour, listen less to the project leader, but engages more in interdependent converzations to improve performance. Implying that some team members will adopt a transactional psychological behaviour since project durations are limited to few years. This is corroborated in Millward and Hopkins (1998), where the authors suggests that workers with shorter duration of engagement tend to be transactional in their attitude towards work.

It is also expected that while team members try to adapt to the controlling norms dictated by the organizational culture under both achievement-oriented and directive leadership, they also

display negative organizational citizenship behaviours by non-willingness to contribute constructive suggestions in progress review meetings. This is inferred from the literature (Podsakoff et al., 2000), that workers with a transactional attitude towards the leadership are more apathetic towards decision making, with a display of absent culture during meetings (Nicholson & Johns, 1985).

Implication for Research Question 3

This research question was stated as follows, RQ3: *How does the mediating influence of leadership style affect the relationship.* RQ3 was answered in hypothesis H5. While the direct link between CCD and PTE was not statistically significant, a mediated relationship through leadership proved statistical significance, with a *p*-value of 0.02. Again, the loadings of the observed SEM variables pertaining to project team effectiveness were statistically significant. Two measured variables of cross-culture, low uncertainty avoidance and long-term orientation, were also highly significant at *p*-vales of 0.001 and 0.000, respectively.

Furthermore, all the measured dimensions of Path-Goal leadership were also positive and significant, thus providing a means to rank the outcome of the leadership behaviours revealed from the data. The simulated path-coefficient of the causal links are as follows: Cross-culture $\rightarrow$ Leadership approach (0.376, p = 0.000), Cross-culture $\longrightarrow$ Project team effectiveness (0.204, p = 0.02), and Leadership approach $\longrightarrow$ Project team effectiveness (0.373, p = 0.000). The cross- culture causal R-squared values are 14.2% for leadership approach; and 23.8% for project team effectiveness predicted by both the leadership approach and cross-culture. The research indicates that without leadership, there is no substantial causal connection between CCD and the effectiveness of project teams. The implications of the above outcomes are multidimensional, as discussed further below.

Firstly, the central cross-cultural dimensions which happens to be long-term orientation and low uncertainty avoidance, can be linked to the adopted leadership approach. Low uncertainty avoidance corelates more with participative leadership (30%) than with achievement-oriented leadership (17%). However, the high rating value of achievement-oriented leadership (77%) and comparatively low rating for participative leadership (50.6%) in the final SEM model suggests that not every team member will adapt to the existing preference for achievement-oriented leadership in projects.

This implication can lead to friction among the workforce as some members of the team continue to expect a leadership style that demonstrates concern for their improvement and competence enhancement needs. In corroborating this implication, the literature (Haslam et al., 2011), suggest the presence of "a mental state" that influences how followers listen to their leaders. Thus, preference for productivity-driven leadership without considering the emotional need for all-inclusive participation of team members can obstruct productivity. This is evident from the ranking of the measured dimensions of project team effectiveness in hypothesis H5, where socialising process has a higher loading compared with productive output. Implying further, that in the absence of participative leadership as the core leadership behaviour in projects, team members enhance interdependent work preference to sustain low uncertainty avoidance and long-term oriented cross-culture within the team. The wider implication of this effect is the fact that team members might prefer to listen more to one another than to the leadership.

Secondly, the low rating for supportive leadership (39%) suggests a workplace with highly specialised team members. Hence, the availability of competence development training programs might be low in projects. If this is the case, it shows that younger graduates without the required

work experience can hardly secure a job placement in project teams in the industry. Thus, fuelling the heavy dependence on highly skilled workforce that are mainly expatriates.

This raises a concern in a nation where the government spend millions of dollars in training citizens in technological knowhow related to oil and gas exploration and production to enhance their capacity to work in the industry that is the mainstay of the Nigerian economy. Consequently, the Nigerian government through her regulatory framework in the industry must provide a means to enhance local competence by encouraging improved supportive leadership styles in projects so that more younger graduates can be engaged and trained to forestall capital flights and reduce the burden of exchange rates on the local currency.

Thirdly, when the direct causal link of cross-culture and leadership approach was investigated in hypothesis H4, the loadings of the dimensions of P-G leadership were as follows: achievement-oriented (62%), directive (60.5%), participative (63.1%) and supportive (56.2%). However, when leadership approach adopted a mediating role in hypothesis H5, the loadings for the dimensions of P-G leadership changed as follows: achievement-oriented (76.5%), directive (63.2%), participative (61.2%) and supportive (45.6%).

Accordingly, while the loadings for both achievement-oriented and directive leadership behaviours improved by 14.5% and 2.7%, respectively in the typical project environment where team effectiveness is needed to interact with both cross-culture and leadership approach, participative and supportive leadership reduced by 2% and 10.6%, respectively. Thus, buttressing the fact explained earlier that supportive leadership is downplayed in favour of achievement-driven workplace culture. A wider implication of this would mean that employees hording information that could improve the bottom-line of cost saving and timely project delivery. This is inferred from

the suggestion in the literature that a coercive and authoritarian leadership approach can make it difficult for workers to share information (Berry et al., 2002).

Additionally, in situations characterized by low uncertainty avoidance and long-term orientation, cross-cultural factors are anticipated. Coupled with a strong inclination towards achievement-oriented and directive leadership, there is a potential risk of furthering a hostile work environment due to the possible presence of role ambiguity. This is also inferred from the literature (Wu et al., 2019), where the authors suggests that the presence of role-ambiguity can hinder productivity in the presence of abusive leadership behaviour.

Implication for Theory Formulation

To further understand the implication of this research, it is important to consider the potential insights from the results on theory formulation. The outcome of the theoretical hypotheses testing led to two main propositions that are investigated further to enhance theoretical formulations in project leadership body of knowledge as follows:

Proposition 1: *There is no direct significant cause-effect connection between CCD and PTE, except when influenced by leadership.* This challenges Hofstede's assetion of a direct link between CCD and PTE (Hofstede, 2011). However, in the final SEM, the direct link between CCD and PTE is positive and significant. This indicates that the team's cross-cultural dynamics and effectiveness depend on stable and suitable leadership behavior within an organizational culture that prioritizes adaptability, consistency, and involvement. In the final one-tailed SEM in Figure 4.22, the weighting of the mission domain of organizational culture was not significant, implying that not all project team members understand the the vision, objectives, and goals of the organization.

Proposition 2: *Organizational culture does not independently moderate the cause-effect link between CCD and PTE; instead, it does so under the influence of leadership.* This second proposition stem out of the need for the leadership to create the norms of interdependency and the control of the entire work process. Hence, the institution of organizational culture norms is important in creating the needed level playing ground for knowledge sharing and utilization within the team.

Implication for Project Leadership in the Nigerian Oil and Gas Industry

Projects are the drivers of the resilience and long-term growth of the industry. Until the technological advancement in favour of renewable sources of energy surpasses the need of global energy demand, oil and gas will continue to be the energy sources for industrial growth. In Nigeria, the demand for fossil fuel is on the increase, from powering residential generators to energy demand for industrial growth. Thus, understanding how the people-factor can be improved to sustain the delivery of projects within cost, scope and schedule is critical to future expansion of the industry. The conceptual framework clearly captured the theoretical robustness of the research. The results emphasises that there are behavioural instabilities among the workforce with regards to the drive for work tractability instituted by achievement-oriented and directive leadership.

Whereas it was not the intention of this research to provide a generalised framework for studying project leadership, yet the evidence from the discussion so far has prompted the need to provide a definition for project leadership from the perspective of organizational culture, Path-Goal leadership behaviour, project team effectiveness, and cross-culture as follows: *Project leadership is defined as the drive for project success enhanced by high productive output and socialising process through achievement-oriented and directive leadership behaviours, where adaptability, consistency, and involvement, are emphasised as behavioural norms by the project*

owner. Team members are expected to exhibit expressive behaviours consistent with low uncertainty avoidance and long-term orientation cross-culture.

This definition of project leadership is premised on the following definitions for the underlined key terms in the project environment as follows. *High productive output* exists if the team's output consistently meets specified project quality (time, cost, and scope). *Socialising process* is present when team members socialise to enhance their capability to work together interdependently with minimal supervision.

Achievement-oriented leadership behaviour exist when the leadership consistently set challenging goals throughout the project duration. *Directive leadership* behaviour exist when the leadership explains the key performance indicators to subordinates in every meeting or opportunity to do so.

Adaptability is a dimension of organizational culture, and it is noticeable when team members consistently and positively respond to project change process through organizational learning.

Consistency is another measured dimension of organizational culture which exist when organizational values, systems, and processes in are in place to enhance agreement, coordination, and integration among team members.

Involvement is also a dimension of organizational culture and exist when team members are aligned and engaged in project activities through empowerment and continual capability/competency development.

Low uncertainty avoidance is a dimension of cross-culture and exist when there is consistent need for clarity of roles and structure of the team. This implies that the team members are willing to take new roles, hence the need for the leadership to clarify the roles and structure of

the team interchange roles and responsibilities. *Long-term orientation* is present when there is high level of adaptation to change.

There is a potential limitation to the above definition because the study is limited to few respondents from three projects. The definition can be strengthened by receiving a more comprehensive information through mixed method where longitudinal data gathering can be used to clarify the findings. Again, the above definition of project leadership has another limitation since the study was conducted in the Nigerian oil and gas industry, and further studies would be required to confirm its applicability to construction project activities in other sectors.

Recommendations for Application

This section presents the recommendations for application from the practical relevance of this research in enhancing the effectiveness of project teams in the Nigerian oil and gas industry. The premise of discussion will be based on both substantive and theoretical contributions to knowledge as derived from the results and the implications of the study discussed earlier. The contexts of discussion will be centred on the design of project teams. As expressed by the findings of this study, *a project environment is defined as a project space where the interplay of cross-culture, leadership approach, team effectiveness and organizational culture co-exist to improve project delivery.* The *project space* is delineated by physical boundaries where project activities occur. The remainder part of this section will be used to provide detailed cause and effect discussions from the study that can enable the design of effective project teams.

Design of Project Teams

Effective teams lay the foundation for project success. The Meyers and Briggs Type Indicator (MBTI) provides three main personality attributes including *Introvert (I), Feeling (F)* and *Judging (J)* which are present in every follower that are suited for projects (Wideman, 2003).

The personality characteristics include dependable, responsible, and consistent. These also resonates with the adaptive culture exhibited by most team members. Hence, there is the need to address the design of teams, provide competency development frameworks for team members and provide effective team leadership (Ghorbani, 2023; Kozlowski & Ilgen, 2006). It is fundamental that the project team membership is aligned with the realities of the project goals, and dependent on the personality of each team members and the organizational culture. This is to ensure that adequate emotional resources are provided to assist team members perform their tasks and fulfil the project objectives set out during the definition of project deliverables. Literature evidence suggest that team design is fundamental and self-evident in reality (Kozlowski et al., 2016; Kozlowski & Ilgen, 2006). The team design is centred around team performance. Here, team performance improvement is connected to the 4C's – Context, Composition, Competencies and Change, discussed in Dyer Jr et al. (2013). These are discussed in turn as follows:

Team Context

The "*Context"* of the team refers to the need for teamwork, nature of the team, expected cultural characteristics, team structure, and instituted systems to support teamwork. Some barriers to enhancing teamwork have been identified in the literature (Jr et al., 2013), to include: (i) reward system that focuses on individual incentives rather than the team, (ii) lack of organizational structure to encourage teamwork, and (iii) the absence of a team culture that supports the growth of team members to enable them to succeed.

The solutions proffered for high team performance within the "context" framework in Dyer Jr et al. (2013), are compared with the suggestions to improve same from the outcome of this research, as follows:

Clear and compelling measurable team goals: This is a Leadership responsibility. The outcome suggests that achievement-oriented and directive leadership behaviour drives project success. Hence, it is important that all related issues that affects work-life balance in this kind of work environment must be addressed to prevent work related stress.

Encouraging teamworking spirit: To improve the capability and effectiveness of the team, the results suggests that the leadership and organizational culture should encourage socialising process to work together interdependently with minimal supervision.

Reward team's effort instead of individual performance: The team productive output should be emphasised and encouraged through the team's socialising process by the leadership and organizational culture. Whereas there is the need for individualised performance recognition, it is more advisable to reward the team as a single entity.

Reducing the effect of bureaucracy: Encourage participative and supportive leadership. This will reduce the power distance and encourage collectivist cross-culture.

Setting up a system that supports the prevailing culture: This is an organizational culture project domain. It is important that the organization encourages both "consistency and involvement" domains which enables team members to align with established cultural norms.

Establishing a good communication system: The communication system is defined within the organizational culture framework. Hence, it is important that the "mission" domain is emphasised where team members understand the goals and objectives clearly and the vision of the organization. This must be driven as part of the organizational culture.

Establishing a training program for the team: This is predominantly a leadership role. Through participative and supportive leadership behaviour, the leadership can detect the competency requirements of team members.

Clearly Define the Dominant Organizational Culture: Through the "Adaptability and Consistency "domain, a training program should be provided to boost the skills of team members.

From the points discussed, this research has provided further insight for understanding the "Context" framework of the team design. Earlier, three main problems with the design of the project team were identified. The investigation identifies which of the studied concepts is directly linked to the issues raised. Firstly, individual reward system is linked to achievement-oriented leadership, hence the weighting for individualism/collectivism domain of cross-culture was non-significant at α = 0.05. The question is how does team members adapt to the work culture when incentives are not uniform across the team? This research also provides insight into the possible action taken by team members to sustain performance when the reward system is individual based.

Two cross-cultural approaches are visible from the study, including long-term orientation and low uncertainty avoidance. This is due to the strong adaptability organizational culture. To boost productivity, the team socialises. Hence, the project leadership can enhance the socialising process within the team by encouraging interdependent task completeness. This is corroborated in the literature (Kappagomtula, 2017), that interdependence is commonly observed within cross-cultural teams. Two approaches to project progress reporting can be adopted – individual and team. The team-based report covers the team's key performance indicators, while the individual report is to address the competence gaps that needed to be closed.

Secondly, the organizational structure to support teamwork is the responsibility of the organizational leadership, and this is reflected in the adopted leadership behaviour and the prevailing organizational culture. Thus, the outcome of the study suggest that the team's adaptive behaviour resulted in low uncertainty avoidance and long-term orientation cross-cultural domain. Though, the power distance was large, the team was still able to sustain high productive output

through socialising process under a high achievement-driven and directive leadership behaviour. The organizational cultural domains to sustain this outcome was identified from the study as "consistency, adaptability and involvement."

Thirdly, the improvement of skills and competencies of team members is the responsibility of the leadership through the adoption of both LAP and LAS behaviours to enable leadership to detect the competency requirements of team members. This can be enhanced by having an organizational culture that drives "Adaptability and Consistency." Hence, the reality-finding investigative approach adopted can be implemented to reveal the underlying factors needed for high-team performance through defining the context for the team.

Team Composition

The composition of the team must be directly aligned with the skills and attitudes of the members of the team (Jr et al., 2013). Four health-check criteria have been identified in Dyer Jr et al. (2013), as critical to the success of the team based on the team's composition as follows: (i) the right technical skill, (ii) interpersonal and communication skills, (iii) the right level of motivation, and (iv) the right team size.

The first two criteria are important for an effective team composition, because empirical evidence suggest that multidisciplinary skills and attitudes in a team can enhance cognitive learning through functional diversity, thus improving the competence within the team (Williams & O'Reilly, 1998). Whereas skills are abilities acquired by the individual through training, attitudes are psychological in nature, and dictates the emotional state of the individual. This is supported in this study where the socialising process was the top most-ranking domain of team effectiveness.

A strong achievement-oriented and directive leadership project environment demands that team members must be skilled to enable them to achieve the team goals as planned or earlier than planned. A clear adaptive attitudinal conduct by team members is revealed in the weighting and loadings of the measured variables in cross-culture and team effectiveness. This is because both leadership and organizational culture are connected to the predictive characteristics of the organization, while cross culture and project team effectiveness are linked to reactive characteristics of the team.

The third criterion is ensuring that team members have the right motivational attitude. However, the low moderation effect of organizational culture on cross-culture's effect on team effectiveness explains that whatsoever attitude displayed by team members is linked to adaptability, and not a total modification of the individual's cross-cultural standards by the operational organizational cultural domain. Adaptational work behaviour can be encouraged through motivation. This is corroborated in (Spector, 2012), that work performance can be improved if stress is reduced and job motivation is increased. Hence, the need for adaptation requires strong motivational leadership behaviour. This theoretical position is emphasising that achievement-oriented leadership behaviour must be supported with strong motivation rewards and incentives. Such continual adaptational attitude can lead personality disorder if the individual has poor stress-coping responses in the long term.

Personality disorder influence how people feel about "self," and strongly affect relationships through anti-social and disruptive work behaviours (Pendleton & Furnham, 2019). Can this be linked to the reason for the low loading in "group experience" domain of team effectiveness from the current study? Although the level of age diversity was not studied, there is literature evidence that low score in group experience domain of team effectiveness can be linked

to age diversity. Empirical evidence also suggest that employees engage in more inter-personal work related discussions when their ages are within the same age bracket (Zenger & Lawrence, 1989). Thus, the group experience can be enhanced when the age diversity within the team is narrow.

On the fourth team composition criterion, the right team size is strongly dependent on the nature and scope of the project. Alladi and Iyyunni (2015) reports that project team members can be less or more than 100 individuals. Since large team sizes are inevitable in projects in the oil and gas industry, to harness the benefits of multidisciplinary team size, this study suggests a blend of leadership approaches (Umuteme & Adegbite, 2022). The ranking of leadership approach in the SEM model adopted presents the opportunity for the leadership to assess how each leadership approach is correlated with the three domains of team effectiveness studied. Effective collaboration within the team can undermine the team size if the leadership strengthens the socialising process and encourages the team to improve the group experience through knowledge sharing. The insights provided on team composition are detailed below:

The right technical skill: As a leadership responsibility, this is done during recruitment, by defining both person and job specification. For an achievement-oriented and directive leadership project environment, team members must possess the right skill to enhance the socialising process, demonstrate low uncertainty avoidance, fit into an adaptive organizational culture, and sustain productivity.

Interpersonal and communication skill: Already, the study suggests that there is high level of socialising process, where interdependency drives the productive performance of the team. Hence, the needed interpersonal and communication skill can be enhanced by training team members on the ability to make presentations.

Right level of motivation: There must be a fair reward system which compares adequately with the workload. Further outcome suggest a non-significant weighting for "mission" domain of organizational culture. Implying that not all team members understand the organizational goals and values. In effect, the long-term orientation cross-culture is a reflection that employees are strongly adapting to the work process. If this is not sustained with the right motivational incentives, they might become demotivated.

The right team size: The right team size depends on the designed workload for the team. However, it is important for the leadership to harmonise the needed productivity level with fatigue planning to prevent overworking team members. Since supportive leadership was least in the study outcome, leadership must ensure that the team's health is always at per with expected productive level.

Team Competencies

A leadership that provides competence training for members of the work team must do so with a heart for the future (Pickett, 1998). Emphasis on goal setting and team orientation in projects have been stressed to enhance project performance (Cheung et al., 2011). There is high possibility of increasing the competence of team members in an achievement-oriented leadership workplace (Kloppenborg, 2015). However, since projects are temporal the need to utilise the skills and competencies in future projects might not be the driving force for the team leadership. In such cases, each team member adopts other means to develop themselves. Implying that, team members can develop the needed competence enhancement while working in the team.

Also, the leadership can provide on-the-job training and development opportunities for the team. The outcome of this research indicates that supportive leadership is low in the ranking of leadership behaviours that are frequently adopted in the project environment, hence team members

must ensure they have the right skill and competence to keep their job. Another important insight from the study is the need for team members to socialise and work interpedently with other members of the team. However, the low loading in “group experience” indicates that knowledge sharing within the team is poor, and team members must depend on sources outside of the team to close critical competency gaps relating to their job description and demand.

This kind of insight enables managers to provide a framework for knowledge sharing within the team, especially during project meetings and on-site workshops. Another approach can be to add mentoring as a KPI for older staff, where the competence requirement of the mentee is assessed periodically. Since performance is highly dependent on the competences of team members, processes that drives high performance must be in place (Arora et al., 2023; Jr et al., 2013). Furthermore, the outcome of this work provides insights into the domains of team competences discussed in the literature as itemised below.

Define and articulate the goals of the team and establishing performance measuring metrics: The goals and key performance indicators are determined by the leadership. The current study reveals the importance of directive leadership in projects, where the leadership consistently explain the key performance indicators to subordinates. The consistent drive for high performance demands that the leadership us able to provide a honest feedback to individual team members. However, some individuals dread feedbacks about their shortcomings (Kloppenborg, 2015), and this kind of attitude is not ideal for team growth. It is important, that the leadership device a means to correct erring team members objectively to ensure there is trust and commitment.

Discuss the means to achieve the goals and work targets: This is related to the definition of goals stated above. It is important that the leadership approach, as observed in the investigation, clearly discuss the means of achieving the team goals with team members before the start of the

project, and periodically during progress review meetings. This aspect of team effectiveness is driven by the achievement-oriented leader who focuses on the bottom-line to enhance productivity. Although the loading for participative leadership is third in ranking, the study indicates that multiple leadership behaviours are needed in projects. Hence, the leadership must include participative and supportive leadership styles as required to ensure the means to achieving the gaols are understood by team.

This way, team members experience developmental growth as their performance improve. Participative and supportive leadership improves routine dyadic interactions, with the individualised level of development gradually shifting to the team. Hence, there is the possibility of increase in "group experience." The high rating in socialising process suggests that a flexible network of role interdependencies is in existence, and this can lead to performance improvement and adaptability (Kozlowski & Ilgen, 2006). Implying that the positive and statistically significant weighting of long-term orientation suggests improvement in the competence of team members.

Making effective decisions: The outcome of the study shows that four leadership approaches are concurrently operative in a project environment in the following descending order: $\mathrm{LAA} \rightarrow \mathrm{LAD} \rightarrow \mathrm{LAP} \rightarrow \mathrm{LAS}$ styles. Thus, the need for an effective participative leadership has been stressed so far, and as the third-ranked leadership approach, it can be argued to some extent that project teams are able to influence leadership decisions. It has been reported that leadership gain trust by making competent decisions, where trust, predictability and consistency are judged as honesty (Kirkpatrick & Locke, 1991). Since the outcome of the study suggests an adaptive work behaviour from the workforce through long-term orientation and low uncertainty avoidance cross- culture, it is important to enhance the "mission" domain of organizational culture to sustain adaptiveness.

In a previous study, it was suggested that cross-cultural teams demonstrates adaptive work culture (Kappagomtula, 2017). Enhancing well-informed decision-making process in projects needs strong loading in participative leadership so that team members can demonstrate ownership of the decision(s) they were part of. Empirical evidence equally suggests that organizational citizenship behaviour (OCB) can influence managerial decisions (Podsakoff et al., 2000), which is expected in a participative leadership environment. This kind of environment breeds strong and confident team members (Yukl, 2013).

Give and receive feedbacks through effective communication: The importance of communication cannot be overemphasised in effective teams. Whereas the leadership in projects is driven mainly by achievement-oriented and directive leadership, the study equally suggests a strong adaptive culture from the team. For millennials, it has been suggested that leadership career development plays a strong role in employee-adaptiveness work-related behaviours (Umuteme, 2020). Hence, it is possible to provide means of career development as a way of enhancing employee-commitment. However, the outcome revealed low exchange of knowledge within the team leading from the low loading in "group experience." Good feedbacks should be tailored towards employee performance and factors to enhance work performance so that team members can begin to see their relevance and responsibility towards the sustainability of performance.

This fact is reintegrated in the literature (Williams & Karau, 1993), that social-loafing, where some team members feel indifferent to team productivity, can be minimised within a team through effective performance-related feedback. Since the outcome suggests higher loading in socialising process, individualized and team-centred performance-related feedbacks must be provided by the leadership in a timely manner to consistently focus the team on work delivery. Else, the socialising process can lead to social loafing and negatively affects team effectiveness

(Yue et al., 2023), where social communications within the team can be detrimental to team performance as members focus more on issues that are anti-performance.

Support team goals through trust building and commitment: It has been reported in the literature that management support is a driving force behind innovation (Adegbite & Govender, 2022). Thus, in a highly adaptive work culture as revealed in the outcome of the investigation, it is possible for innovation to strive if project managers provide the necessary support. Earlier it was also emphasized that trust-building is conditional on the nature of the leadership. It has been suggested elsewhere that consistent leadership behaviour can enhance trust-building (Kirkpatrick & Locke, 1991), making it possible for team members to predict leadership actions towards the actualization of team goals in different work-related situations.

The adoption of Path-Goal leadership as most suitable in project environment where leadership, culture and team effectiveness are dynamically related concepts and provides a means of enhancing leadership presence throughout the duration of the project. This is because, the leadership approach will be consistently influenced by the work situation and team-characteristics. The outcome of this research agrees with the position that the cross-culture can influence the leadership approach. A trust-building leadership culture can also influence job satisfaction (Tsai, 2011), which in turn can possibly reduce employee turnover rate.

Capacity to resolve internal conflicts: An organization with a rigid approach to leadership can become conflict-ridden and where work becomes individualistic instead of team-centred (Denison, 1984). This is possible in the industry of study because of high level of LAA and LAD leadership-driven approach. Hence, the current study outcome suggests the need for project leaders to give appropriate attention to the implementation of both participative and supportive leadership, which are lower in reflective loadings. Since the nature of the construct for leadership suggest that

the leadership is situational, emphasized by matching person and job characteristics, job-related conflict can also be minimised by reducing role-ambiguity. Thus, whereas there is high adaptive culture occasioned by low-uncertainty avoidance in project teams, it is important that the project leadership ensure that roles are occupied by highly competent personnel else there will be low productivity and continuous re-work. This observation is equally supported by the fact that an achievement-oriented project environment requires highly specialised work team, to substantiate the low loading in supportive leadership.

Taking risk and encouraging innovation: The result suggests that team members are willing to take new roles through an adaptive organizational culture work environment. Thus, implying that team members are willing to take some level of risks, but the presence of high directive leadership behaviour can reduce the level of risks. Again, innovation is rarely expected since the project is driven by directive policies, standards, specifications, and work procedures. However, some level of innovation can be in the form of minimising conflicts through the proactive engagement of team members who always disagree with the work process.

If the disagreement is linked to some level of incompetence, it is possible to improve the level of information and knowledge sharing within the team that will enhance the group experience. The leadership can set up a mentoring program to help low-performing team members to improve better.

Team's Change Management Capability

Change management is common in projects – within the team itself and in the work scope and duration. Empirical evidence suggest that innovation do not strive in a work environment with strong resistance to change (Adegbite & Govender, 2022). This results shows that the team scored high in low uncertainty avoidance and adaptability cultures. Implying low possibility of having

individualised or team-based innovation in projects in the Nigerian oil and gas industry. For change management, the highest weighting score for organizational culture was 43% for adaptiveness culture, where the "team members consistently respond to project change process positively through organizational learning."

Implying further, that the leadership must encourage knowledge sharing within the team and provide career enhancement capabilities in the form of continuous on-the-job training. Thus, the approach adopted can help the project leadership in assessing the level of change management needed, and the correlational factors influencing this. For the current study, adaptability culture is positively correlated with socialising process (0.40), productive output (0.23), achievement-oriented leadership (0.25) and directive leadership (0.27), supportive leadership (0.19) and long-term orientation cross-cultural domain (0.35).

Thus, the higher relative correlational values from each team effectiveness, cross-culture and leadership are 0.40, 0.35 and 0.27, for socialising process, long-term orientation, and directive leadership, respectively. Thus, it is pertinent to suggest that when the need is to enhance adaptation to change within the team, emphasis must be focused on how the coming change can enhance members' capability to work together interdependently with minimal supervision. As expected, the two main aspects of adaptation to change within the team as articulated in the literature (Jr et al., 2013) are compared with the insight from this research to include, initiating change for improved performance and instituting change management mindset within the team to enhance performance.

Recommendations for Future Research

The outcome of this work suggests the need for further theoretical and empirical research in furtherance of the knowledge needed to design a holistic project team, where leadership is all-

inclusive and supports the drive for top-quartile performance. The study presented facts on what is obtainable in the Nigerian oil and gas project environment from the perspective of culture, leadership, and team effectiveness. As seen in the study results, what is usually obtainable is that while the leadership drive for high profitability and emphasis on cost control and reduction, the people-factor of the nexus amongst project environment controlling and operational factors is sometimes underplayed.

Again, while Hofstede's masculinity versus femininity dimension was not directly assessed, the emphasis on adaptability and commitment suggests the presence of this dimension. High levels of achievement-oriented cross-culture indicate emotional intelligence, empathy, and ambition. Therefore, in future studies of this nature, the masculinity versus femininity dimension should be investigated.

Consequently, one vivid area for further research is the need for a qualitative study that can provide deeper insight into the following observations from the structural equation model (SEM) results. These have been classified according to the concepts of cross-culture, organizational culture, leadership, and team effectiveness and will be disused in turn.

Cross-Culture

The following questions arises from the non-significant weights of the cross-cultural dimensions studied, including power distance and individualism/collectivism.

Question 1: Why did the outcome of the descriptive statistics suggest large power distance within the project environment, yet power distance was a non-significant determinant of the cross-cultural project environment in the SEM?

Question 2: Although the analysis of the descriptive statistics suggests a 2/3 ratio of the presence of individualism/collectivism in the project environment, why was this domain of cross-culture not a significant contributor of the cross-cultural project environment?

The first question is related to the significance of power distance in defining the cross-cultural project environment in the industry of study. Earlier in chapter 2, power distance was defined as "the extent to which the less powerful members of institutions and organizations within a country expect and accept that power is distributed unequally" (Hofstede, 2011, p. 9; Minkov, 2013, p. 206). The outcome of the study suggests that the mean and standard deviation for power distance was 3.80±0.96, implying a lower and upper bound of 2.84 and 4.76, respectively. The above statistical representation suggests the presence of a large power distance, and that the decision-making process is the responsibility of the leadership.

This observation is corroborated in the SEM outcome where both achievement-oriented and directive leadership styles where the dominant leadership behaviour in the studied project environment. For power distance, the only positive and significant relationship that exist is between power distance and moderate collectivism as suggested by the results. This observation was evidently supported by socialising process domain which had the highest rating among the dimensions of team effectiveness. Also, the need for participative leadership was reiterated as the most prefeed leadership behaviour in hypothesis 4, in the casual relationship between cross-culture and leadership approach. These empirical observations require further insights to provide deeper meaning to the relationship existing between power distance and teamwork under the controlling influence of leadership and organizational culture. Adopting a qualitative study to provide further insight into the issues raised above is premised on understanding the complex social constructs within the team that are yet to be revealed in literature. The intended meanings and interpretations

should be determined by both social and business certainties (Bordens & Abbott, 2018; Saunders et al., 2019). Thus, the controlling variables to be investigated to provide answers to Question 1 within a cross-cultural project environment should include power distance, individualism/collectivism, socialising process, organizational adaptability, supportive leadership, and participative leadership.

Cross-culture has been observed to influence various factors of project success through the actions of the project leader in the literature (Aycan, 2000). These factors include goal setting, performance evaluation approach, communication performance feedback to team members, and team motivation. Most importantly, how does power distance influence how the project leader exercises these functions. When adopting a qualitative research approach, it is important to design the interview questions to enable the interviewee relate these controlling factors to project success.

The second question is related to why individualism/collectivism where not significant contributors to the cross-cultural project environment based on an alpha significance level of 0.05. Why is this dimension of cross-culture important to project success? It is essential to investigate how the varied competences and professions in the team influence planning, and role diversification and differentiation, and how these can influence project success. Equally significant is the influence of individualism/collectivism culture in projects teams where there is high presence of individualised expert roles. The study results revealed high level of socialising process where team members work interdependently, but low loading in group experience. The only significant relationship between team effectiveness and individualism/collectivism cross-culture was a small negative correlation with productive output.

The question is why was individualism/collectivism cross-culture not significantly related to the other dimensions of team effectiveness – socialising process and group experience? Thus,

the outcome suggests the need to enhance a collective project culture that can improve the bottom line through socialising and experience sharing. Therefore, the focus of the qualitative study that will provide answers to the second question should be the unravelling of the core contributing factors determining the influence of individualism/collectivism on the performance-driven social integration within the team.

Project Leadership

The controlling leadership behaviours in the Nigerian project environment from the study can lead to work-driven emotional culture. Incidentally, both participative and supportive leadership have lower loadings from the SEM. This calls for concern, and it is important that a qualitative research approach is adopted to provide the environment where project leaders and managers provides unique experientially based information to provide learning and integration-driven project team design. The four leadership approaches were the dimensions of Path-Goal leadership, and have been adopted based on the advantages presented in chapter 2 of and published by this author elsewhere (Umuteme & Adegbite, 2022). On a scale of 5, the simulated results of the leadership behaviours studied are ranked relatively in the following contributing descending order of 5, 4.4, 3.3 and 2.5 for achievement-oriented, directive, participative and supportive leadership behaviours, respectively. Implying that while achievement-oriented leadership was present 100% of the project period, directive leadership was 88%, participative leadership was 66% and supportive leadership 50%. Of concern, is the percentage presence of both participative and supportive leadership. This have generated the following situation-driven reflective questions arises:

Question 1: Why was the team not involved in all the leadership decisions? A leader that demonstrates participative leadership behaviour in all decision making will always integrate the

suggestions of team members into the final workplan for the team. A 66% score for participative leadership, thus favouring the adoption of achievement-oriented leadership suggests autocratic decision-making in certain project instances, as supported by literature (Jung et al., 2014).

Question 2: A situational project leader is either directing, coaching, supporting or delegating (Blanchard et al., 2013; Northouse, 2019). However, since directive leadership is related to the teams' key performance indicator(s) as explained by the project leader, a midway directing-coaching leadership style as obtained in this research would imply the leader spends some time encouraging and soliciting for team members input in key project decisions. How does the project leader act midway between coaching and directing behaviours?

The first question is within a project leadership behavioural context that favours more LAD and LAA behaviours in determining the extent of the followership enjoyed by a project leader in the industry. This is important in understanding how much of delegated power is available to subordinates. Studies have outlined how a project leader can influence the behaviour of team members using either participative or directive leadership styles based on the individual follower's *desire for control* (Northouse, 2019).

The desire for control was further discussed in the literature, to comprise of internal or external locus of control. Team members with internal locus of control take ownership of their job by relying on internal personality to drive their personal decisions and efforts. Conversely, external locus of control team members are those who expect control from external factors such as fate, luck, or environmental circumstances (Rotter, 1990; Smith et al., 1995). The literature observed that internally driven locus of control team members can be led using participative leadership style, while those expecting external control are more suitable for directive leadership style. The locus of control is also related to the concept of power distance and can also explain the extent of

participative leadership within a project team, albeit the weighting of power distance was not significant in this study. Yet, the correlation coefficient between power distance and participative leadership is negative, showing that a project environment with large power distance do not favour participative leadership behaviour.

How much of project control and ownership is resident within the team is dependent on the philosophy driving the project. Since a significant positive relationship exist between participative and directive leadership, the nature of the interplay between situational control elements within the project environment such as reinforcements in the form of reward and punishments, and the performance of the team in general can be investigated.

Although studies on the relationship between locus of control and individualistic/collectivist cross-culture have been studied in the literature (Smith et al., 1995), the need to deepen this investigation is informed by the outcome as discussed so far. The above gap needs to be closed using a mixed method research approach. More importantly, the focus of future studies should be on enhancing self-efficacy through training to improve group experience, personal mastery and competence within the project team. This can provide the needed insights into what team members must do to understand the environmental controlling factors that impacts on their performance, and how to proactively handle them (Infurna & Reich, 2017).

The second question within the context of leadership is experienced-based and the response can be retrieved in a qualitative study since there are no theoretical outcome in the literature that provides a theoretical framework for this nature of project leadership yet. The qualitative approach should include observational studies of the project leader in demonstrating supportive behaviours such as asking for input from subordinates, problem solving, praising team members for fulfilling their work-delivery promises, sharing information about him/herself, and listening to members of

the team. Since projects require a complementary situational leadership behaviour most of the time, the importance of combining both directive and supportive leadership has been reiterated in the literature (Blanchard et al., 1993, 2013).

High directing and low supportive leadership approach suggests a team where some of the members have low competence in critical aspects of the projects (Northouse, 2019). However, the mid-way score of supportive leadership when compared to directive leadership suggests 50/50 coaching/directing commitment needs within the team. The study also suggests that team members improve competence through interdependent socialising process. Conversely, the level of commitment from the leadership is low and must be enhanced to yield high level of group experience. Therefore, it is pertinent that team members are provided avenues that can enhance their participation in decision-making, and work-related competence building training opportunities. There should be greater emphasis on delegation as a means of enhancing ownership among team members. Earlier, the literature emphasised that millennial engineers prefer career opportunities that can enhance their leadership growth (Umuteme, 2020), hence there is an appeal to deepen the leadership-employee nexus for performance-driven participative decision-making workplace.

Furthermore, it is important to investigate how low participative and supportive leadership project environment influences work/job adaptive culture among millennials in the Nigerian oil and gas industry. This kind of study can be invaluable in reducing the turnover rate among millennials in this industry.

Organizational Culture

The non-significant SEM weighing for “mission” domain of organizational culture in this study is not suggesting a future-driven work family with the organization. A key business value is

for employees to have a full grasp of the objectives and goals of the organization. It is important to investigate the presence of some characteristic employee withdrawal behaviour(s) such as employee absenteeism, lateness, and tardiness (Podsakoff et al., 2000). The study outcome suggests that “missions” was positively and significantly related with low uncertainty avoidance, and with all the leadership approaches in the same descending order predicted in the SEM, where the “mission” culture was well-matched to achievement-oriented leadership and socialising process.

The question is what factors drives the adaptability of team members towards understanding the objectives and goals of the organization? Insight to this question can be obtained from earlier emphasis on the low loading in participative and supportive leadership styles in preference to a more achievement-oriented and directive leadership behaviour work environment. Project leaders in the industry of study must do more to indoctrinate project team members that instead of seeing their involvement in organization as strictly project-driven, a career-driven approach to leadership can motivate members to become interested in the overall objectives and goals of the organization. This is a domain of corporate social responsibility (CSR), which emphasises how the industry can positively affect the socio-economic lives of all stakeholders. It must be restated that culture shape values (Schein, 2004), and how much of prior-individual cultural value distortion by the organizational culture is acceptable during the project duration? This is where resistance to instituted organizational cultural norms emanates from. Thus, this research equally recommends a further investigation into how team members can be encouraged to become interested in upholding and delivering the organizational goals and objectives.

Team Effectiveness

This study provided two team effectiveness models which are contextualised in the domains of cultural influences within a project team. The interlace between the other factors – leadership and team effectiveness, is pivotal on the "resilience to change" and toughened by the organizational culture. Hence, the study reveals more of an adaptive behaviour from team members. This equally explains why the relationship between "adaptability" domain of organizational culture and all the leadership styles, inclusive of two domains of team effectiveness – viz, predictive output and socialising process, and long-term orientation cross-culture, were positive and statistically significant.

Again, "involvement" of organizational culture domain was negatively and significantly correlated with individualistic culture, which is self-explanatory. "Consistency" is the only domain of organizational culture that was significantly and positively related to "group experience" domain of project team effectiveness. This explains a work team that is willing to improve competence and performance. A further investigation of the existing project learning environment to enhance the teams' experience was carried out through the correlation with leadership approach. Suggesting a positive and significant relation of "group experience" with only achievement-oriented leadership behaviour.

To provide further knowledge of the underlying factors influencing the competence of the team in an achievement-driven workplace, it is important to investigate why none of the cross-cultural dimensions were significantly related with group experience. Since group experience is low from the SEM simulation under the complex interaction among CCD, LA, OC and PTE, the need to enhance team competence must be evaluated from the angle of value addition, and this information can be retrieved through a qualitative interview with the project leader or manager.

This is because, one of the activities of a leader is to motivate the team to be committed to the "mission" requirement (Mumford et al., 2000). If the "mission" domain is not significantly related to the productive output of the team as evident in from the results, but significantly and positively related with supportive leadership, it can be inferred from the literature (Yukl, 2013), that the leadership exhibits a deficiency in self-regulation and possible emotional instability.

Again, it can be inferred that the leadership is unable to sustain own optimism and enthusiasm about the organizational mission. If this is the case, the project environment can generate stressful work conditions due to deficiency in critical job-specification competences needed to enhance project success. Mutual trust, loyalty and respect, and differentiated relationship with subordinates have been suggested in the literature to facilitate the team's mission (Yukl, 2013). The question then is on how a project leaders can achieve this demand of team-focused performance amid other project uncertainties bothering on values and beliefs. This concern requires a combined qualitative and quantitative research approach.

Section Summary

From the discussion so far, this section has provided some recommendations for future study, as follows: There is the need to provide further qualitative insight and deeper meaning on the connection existing between CCP and teamwork under the controlling influence of LA and OC. This was premised on the fact that CCP was not a significant contributor to the cross-cultural environment in the SEM. The controlling variables to be investigated can be extended to include power distance, individualism/collectivism, socialising process, organizational adaptability, supportive leadership, and participative leadership. It was equally important to investigate how power distance influence the way(s) a project leader exercises the functions of goal setting,

performance evaluation approach, communicating performance feedback to team members, and team motivation.

Another research need was to investigate how the diverse competences and professions in a project team influences the planning of project activities, role diversification, and job differentiation, and how these can influence the success of a project. Equally noteworthy is the influence of individualism/collectivism culture in project teams in the presence of highly individualised expert roles. Hence, there is the need to study and unravel the main contributing factors that controls the influence of individualism/collectivism cross-cultural environment on performance-driven social integration within the team.

How much of project control and ownership is resident within the team is dependent on the philosophy driving the project. Since a significant positive relationship exist between participative and directive leadership in the current study, there is the need to investigate the nature of the interplay between situational control elements within the project environment, such as reinforcements in the form of reward and punishments, and the performance of the team in general.

Furthermore, the need to also investigate how low participative and supportive leadership project environment influences work/job adaptive culture among millennials in the Nigerian oil and gas industry was also emphasised. Equally stressed was the need for further investigation into how team members can be encouraged to become interested in upholding and delivering the organizational goals and objectives.

Finally, it is important to further investigate why none of the cross-cultural dimensions were significantly related with group experience domain of team effectiveness. This will provide further knowledge of the underlying factors influencing the competence of the team in an achievement-driven workplace.

Conclusions

This research was conducted in Nigeria, with participants drawn from the Nigerian oil and gas industry. This was done to close the gap in the literature of the need to provide further insight into the factors influencing project delays and failure. The outcome also provided insights on the factors that can improve the complementarity between project leadership and members of the project team. Previous empirical studies suggest the need to provide further insights into the performance of project teams from the perspective of cross-culture, leadership behaviour, influence of organizational culture and team effectiveness. A quantitative research construct connecting the above concepts was adopted to develop a leadership model using structural equation modelling.

The analysis of the collected field data includes descriptive statistics, regression, correlation, path-coefficient, direct and indirect effects, and model fit analysis. The participants aged 30 to 60 years of were recruited with a blind selection process where the researcher had no influence because of the inclusion criteria and the difficulty of accessing the actual number of project workers in the industry of study.

This number was estimated using the 80% effect power criterion recommended in the literature (Cohen, 1988; Cohen et al., 2003), at alpha level of 0.05 and different effect sizes of 0.15, 0.25 and 0.35. The minimum effect size of 0.15 returned a maximum sample size of 190 participants, and was adopted, to measure the smallest effect of the predictor variables on the response variables through the data retrieved. Participants' selection was through a blind selection process where the researcher had no influence because of the ontological need to represent reality, and the extraction of project experience in the industry. Thus, the main inclusion criterion was that participants must have at least one year of experience in project activities in the industry. Those

with less than one year of experience related to project activities in the oil and gas industry were not included, to ensure the participants have the required experience and understands project dynamics. Data was collected cross-sectionally from 230 participants, with a target of 200 returned questionaries for the data analysis, but 210 participants returned the survey for analysis instead.

The *a priori* thesis was that *project leadership provides a mediating role in the casual relationship between CCD and the effectiveness of the team.* A further moderation role of organizational culture on cross-culture was advocated. The *a posteriori* outcome of the study supported the above thesis, but with limited moderation role of organizational culture. Thus, the *a posteriori* thesis proposes that both CCD and OC are unique cultural constructs. However, team members are willing to adopt and adapt to the dimensions of OC from the standpoint of long-term orientation and low uncertainty avoidance cross cultural domains.

The effect of this was investigated further in the study. This concluding section provides a recap of the main themes, design of the research, main findings, and practical application of the study. Based on the limitations encountered during the study, further areas of investigation have been recommended for future research, with emphasis on the implementation of mixed method research.

Main Themes of the Study

Understanding the typical Nigerian oil and gas project environment from the perspective of knowledge-based implicit and explicit inter-paly amongst organizational culture, cross-culture, team effectiveness, and project leadership was relatively lacking in the extant literature until now. Studies in project management and leadership have identified how people-driven factors can influence project leadership behaviour(s). However, in-depth studies that investigated the connection between PTE and CCD are also lacking.

This investigation is taken further to include the complementarity of team effectiveness, leadership, and culture in a project environment defined by the specific needs of the Nigeria oil and gas industry where expert and professional job competences are strongly needed. The investigation was designed to close the gap in the literature on the need for a fit-for-purpose leadership mediated model to study the complex links between organizational culture, cross-culture, team effectiveness, and project leadership in projects. This is mainly to improve existing team effectiveness models discussed in Chapter 2.

The main gap in the existing team effectiveness models was that none has considered the influence of cross-culture on the team members' behaviour in projects, and how the need to become members of the team can lead to trade-offs of personality interests. Most importantly, the position espoused in the GRPI team effectiveness model by Rubin, Plovnick and Fry (1977) is not partly supported in project teams within the industry, because the project goals are always defined *ab initio*, and the manager recruits team members based on the match of the job requirement with the person characteristics occupying these roles. Whereas this team effectiveness model recognised the need for team bonding through task interdependency and social interaction, there is no clear explanation of organizational leadership role in team-focused growth and in diagnosing the issues affecting team performance.

Again, whereas some studies had suggested the adoption of transactional, transformational, and authentic leadership behaviours in projects, they were limited by the fact that they did not consider the multiplicity of people and job characteristics as determinants of leadership behaviour, hence the paper argued in favour of path-goal leadership theory as most suited for project team leadership roles (Umuteme & Adegbite, 2022). A structural equation modelling approach was adopted with the latent variables interacting in a single organizational research construct defined

as follows: cross-culture (predictor), team effectiveness (main outcome), Path-Goal leadership (mediator) and organizational culture (moderator).

The main theoretical assumptions in this study were based on the empirical relationships inferred from the extant literature as follows: (1) A direct cause-effect relationship exists between CCD and PTE; (2) Leadership plays a mediating role in cross-cultural teams; (3) Organizational culture defines the norms in the workplace, hence provides a moderating effect on CCD; and (4) Teamwork is enhanced through social and task cohesion.

Adopting a quantitative research approach, the ontological standpoint of reality was defined to focus on people-centred influence on the project space. To create further understanding for the direction of the study, some working definitions were adopted as stated below:

Cross-Culture: "Culture is the collective programming of the mind that distinguishes the members of one group or category of people from others" (Hofstede, 2011, p. 3). This concept explains how people from different cultural beliefs and assumptions interact to create a team culture. This team culture is moderated by the OC to ensure that the norms that define the expected behaviour in the team is controlled by organizational policies.

Leadership Approach: Leadership "is a major force that influences goals, the amount of involvement with and commitment to productivity, the amount of creativity in solving problems, and the degree of satisfaction from work" (Blake & Mouton, 1981, p.440). As a mediating construct, the regressed effect of CCD on PTE is expected to be reduced by the presence of leadership with a possible improvement in the effectiveness of the team. However, the outcome of the investigation suggest that leadership enhances the influence of CCD on PTE and did not reduce the influence as expected before the study.

Thus, suggesting that the team's culture equally influences leadership decisions. The *a priori* theorem was based on the expectation of a high level of autocratic project leadership behaviour.

Project Team Effectiveness: This concept has been defined from the perspective of group experience, productive output, and socialising process, as discussed in Chapter 2. Accordingly, the literature explained team effectiveness as the team's output consistently meeting specified quality, quantity, and timeliness; socialising among team members enhancing their capability to work together interdependently with minimal supervision; and team interactions and meeings contributing positively to the well-being and learning of individual team members. Team effectiveness is the main independent latent variable in the investigation.

Organizational Culture: This concept is defined "as the accumulated shared learning of a given group, covering behavioural, emotional, and cognitive elements of the group members' total psychological functioning" (Schein, 2004, p. 17). As a moderator in this construct, it implies that the relationship between CCD, LA, and PTE is contingent on OC. However, the *a priori* position was not totally supported as the moderation effect was relatively low.

Adopted Research Approach

The study adopted a cross-sectional closed-ended Linkert scale data collection survey tool administered to participants through a blind selection process where the researcher had no influence. This was achieved based on a pre-defined specific participants' recruitment inclusion and exclusion criteria. Furthermore, the study retrieved information from 210 participants without coercion, provided they have worked in project teams up to one year experience or more. The inclusion criteria set the nature of participants to only those who can and are willing to provide informed consent for themselves. With no intension for outright discrimination, respondents with mental disability and are not be able to provide their own consent were not recruited for the study.

The questions included in the survey questionnaire have been ordered based on the ontological realities derived from the extant literature on the dimensions of the four project environment concepts in this study.

The empirical focus of this research was to rank the leadership behaviours in the order of their numeric loadings as a reflection of their significance in enhancing team effectiveness. The SEM design was used to mimic the reality in the study industry and to replicate the interaction among the concepts of study within the ontological reality defined by the prevailing organizational context. The outcome of the study has provided the rationale for a model for auditing project performance robustness from the perspective of organizational culture, cross-culture, team effectiveness, and leadership, The detailed literature review conducted in Chapter 2, suggests that this nature of study was absent in the extant literature until now. To realise the aims and objectives of the study, a multi-stage exploratory method was adopted throughout the data analysis and discussion section to uncover the correlational connections between the operationalised measured variables of cross-culture, leadership, organizational culture, and project team, and the causal relationship between these four concepts. The criteria for hypothesis testing and extrapolation of meaning have been derived from the literature (Cohen, 1988; Hair et al., 2017).

Furthermore, the transfer of individual personal emotional attachment to the study was achieved by ensuring the questions in the survey instrument were interconnected with the work experience of the team members recruited for the study. The implementation of reliability and validity checks was done to ensure conformability of the study results to appropriate research practice. The overarching aim of the doctoral research was to develop and simulate a leadership model for studying the complex connexion among the concepts in a project environment. With the overall purpose of enhancing performance of projects in the industry, and to provide further

insight into the comparative consequence(s) of the presence of the measured dimensions of each concept in the Nigerian project environment in the industry.

Results and interpretation

The findings of this study were assessed from the standpoint of providing insights into what ways each latent variable have influenced the project environment studied through their respective measured variables. To this point, the project defining interactions and models studied offered credible indications suggesting that the four concepts studied are consistently linked to the realities in projects as causal or correlational variables. The typological emphasis of relating the measured dimensions in the survey instrument to the experience of the participants provided the needed framework for evaluating the findings of this study, and how the correlation among these dimensions have provided insight into the interacting factors in the project environment. As team effectiveness and leadership were the outcome latent variables of the study, they have been evaluated further as being influenced by cross-culture or organizational-culture. Consequently, the high adaptation to change by the project team members was observed as a predominant outcome of the studied project environment, and compelled by: (i) higher demand for achievement-oriented and directive leadership styles in preference to both participative and supportive leadership behaviours; (ii) expression of organizational values systems, and alignment with the prescribed processes that enhances agreement, coordination, and member-member integration; (iii) necessity for a positive and consistent response of team members to the change process throughout the duration of the project; and (iv) engagement of members of the team in project activities through empowerment, and to be readily available for on-the-job competency development opportunities.

Implications of findings

The outcome of the study revealed that organizational culture domains were active in the following weighting descending order of adaptability, consistency, and involvement, while weighting of the "mission" domain was non-significant at the adopted study alpha level of 0.05. The team characteristics have been determined mainly by the cross-cultural dimensions of long-term orientation and low uncertainty avoidance, and team effectiveness was enhanced through the task-oriented socialising process and productive output.

The SEM predictions of the prevailing variables influencing the activeness of the project environment was improved under the mediation role of the adopted path-goal leadership style, while the moderation effect of organizational culture on cross-culture was low on both leadership and team effectiveness outcomes. Implying that the use of structural equation modelling approach provided the best certainty of predicting the reality of the interactions among the studied concepts than ordinary regression and correlation statistical data analysis methods. The predictive strength of the team effectiveness models developed in this study was enhanced by adopting a formative approach for the measured dimensions of cross-culture and organizational cultures. This kind of approach ensures that no individual variable can wholly define the predictability of the cultural environment in projects.

Furthermore, the leadership mediation path of "culture → leadership approach → team effectiveness," simulated a causal regression implication for the trio-constructs in enhancing project delivery through team-centric top-quartile performance. The team-focused leadership style, represented by both participative dimension of P-G leadership, impacts collective social groups rather than individual followers, which corroborates the position in the literature (Wu, 2006). Suggesting that the leadership behaviour adopted is dependent on the anticipated

productivity from the team. The response to the survey questions on achievement-oriented leadership is related to organizational cultural influence on job empowerment, defining the competency requirement for the team to enhance group experience, clearly defining the goals and vision for the team, enforcing the needed organizational beliefs and assumptions, and defining the agreed change process. The reactive response from team members from a cross-cultural perspective must focus on the horizon and adaptational needs established by the leadership, because of the associated gains defined by the organizational culture in the project environment within the context of job enhancement. The study revealed that team members adapted to the norms dictated by organizational culture through long-term orientation and low uncertainty avoidance.

Thus, the associated uncertainties were generated internally by the leadership, and the path to team effectiveness must be driven by the prevailing leadership behaviour with the same effect for both cultures since they are unique non-dependent social institutional constructs. As corroborated in the literature (Prati et al., 2003), project leaders motivate the team toward a collective action, while creating a work environment that encourages both task and social integration and bonding. As already expressed in the literature review, and published elsewhere (Umuteme & Adegbite, 2022), leadership motivation has a strong emotional bond with the needs of the workforce. Some of these needs are deepened in associated social-cultural or religious values and the psychological personalities of team members.

Hence, this study opined that the existenceof the interacting variables of organizational culture and the prevailing leadership behaviours in the simulated construct undermined the effect of CCD within the project team. Furthermore, this study provides a strong rationale for enhancing business outcomes through diversity and inclusiveness, where individual employee is expected to

adjust to the dominant social-cultural norms defined by the organizational culture for a complementary work ethics.

Further implication from the study outcomes is the preference for a combined achievement-driven and directive leadership behaviours while given lesser attention to participative and supportive leadership. Hence, by adopting LAA cross-culture, team members work to receive remunerations, attend less to the instructions of the project leaders, but engages more in interdependent converzations within the team to improve performance. Suggesting that some team members have adopted a transactional psychological contract behaviour, which was corroborated in a previous study (Millward & Hopkins, 1998), that transactional work-related attitude is exhibited by employees having short duration work contracts. Podsakoff et al. (2000), theorised that workers exhibiting transactional attitude towards the leadership are indifferent towards decision making and not willing to contribute constructive suggestions in progress review meetings. This concern is important because of the low loadings for both LAP and LAS when compared with both LAA and LAD behaviours. Consequently, the leadership must watch out for "absent minded" attitude during meetings as opined in Nicholson and Johns (1985).

Since the adaptive work-related culture demonstrated by some of the team members are reasonably compelled by low uncertainty avoidance and long-term orientation in a leadership environment that is highly productivity-driven, it is equally important for the leadership to watch out and provide mitigating measures for the occurrences of negative organizational citizenship behaviours (OCB), such as the non-demonstration of helping behaviours, low compliance to instituted policies, and low demonstration of individual initiative. This is important because empirical results suggests that the willingness of employees to demonstrate favourable OCBs is related to the behaviour of the leader (Podsakoff et al., 2000).

Theses Formulation

The following theses have been formulated from the outcome of the study.

Proposition 1: There is no direct significant cause-effect connection between CCD and PTE, except under the meadiated influenced by LA.

Proposition 2: Organizational culture does not independently moderate the cause-effect relationship between CCD and PTE; instead, it does so under the influence of LA.

Proposition 3: The presence of a robust socializing process within a team as in this study, improves job skills through interdependence among its members and reducing the requirement for a supportive leadership approach. This addresses a critique of the Path-Goal leadership theory that followers will develop a strong reliance on the leader to complete tasks due to the leader's supportive behaviour.

The study further suggests that projects are the drivers of the resilience and long-term growth of the industry. Until technological advancement in favour of renewable sources of energy surpasses global energy demand, oil and gas will continue to be the energy sources of choice for industrial growth. In Nigeria, the demand for fossil fuel is on the increase, from powering residential generators to energy need for industrial growth.

Thus, understanding how the related factors influencing project success are improved to sustain the delivery of projects within cost, scope and schedule is critical to future expansion of the industry. The theoretical framework clearly captured the theoretical robustness of the research. The results emphasises that there are behavioural instabilities among the workforce with regards to the drive for work compliance instituted by achievement-oriented and directive leadership.

Whereas it was not the intention of this study to provide a generalised framework for studying project leadership, yet the evidence from the discussion so far has prompted the need to

provide a definition for project leadership as follows: *Project leadership is defined as the drive for project success enhanced by high productive output and socialising process through achievement-oriented and directive leadership behaviours, where adaptability, consistency, and involvement, are emphasised as behavioural norms by the project owner, and team members are expected to exhibit expressive behaviours consistent with long-term orientation cross-culture and low uncertainty avoidance.*

The above definition of project leadership is based on the outcome of this research, and it is premised on the following definitions for the key terms in the project environment discussed further. High productive output exists if the team's output consistently meets specified project quality (time, cost, and scope). Socialising process is present when team members socialise to enhance their capability to work together interdependently with minimal supervision. Achievement-oriented leadership behaviour exist when the leadership consistently set challenging goals throughout the project duration.

Directive leadership behaviour exist when the leadership explains the key performance indicators to subordinates. Adaptability is a dimension of organizational culture, and it is noticeable when team members consistently and positively respond to project change process through organizational learning. Consistency is another measured dimension of organizational culture which exist when organizational values, systems, and processes are in place to enhance agreement, coordination, and integration among team members. Involvement is also a dimension of organizational culture and exists when team members are aligned and engaged in project activities through empowerment and continual capability/competency development.

Low uncertainty avoidance is a dimension of cross-culture and exist when there is consistent need for clarity of roles and structure of the team. This understanding of low uncertainty

avoidance implies that team members are willing to take new roles, hence the need for the leadership to clarify the roles and structure of the new roles and responsibilities. Long-term orientation is present when there is high level of adaptation to change.

Knowledge contribution to academic and practice

As expressed by the findings, a project environment is defined as a project *space where the interplay of leadership approach, organizational culture, cross-culture, and team effectiveness co-exist to improve project delivery*. The project space is delineated by physical boundaries where project activities occur. The team design is centred around team performance. Here, improvement in team performance is connected to the 4C's – Context, Composition, Competencies and Change, discussed in Dyer Jr et al. (2013). Three main problems with the design of the project team haven been identified in this study, and which of the studied concepts is directly linked to the issues raised in the discussions that follows.

Firstly, individual reward system is transactional I nature and linked to achievement-oriented leadership behaviour. Hence, the weighting for individualism/collectivism domain of cross-culture was non-significant at a = 0.05. The question is how does team members react when incentives are not uniform across the team? The outcome of this study also provides insight into the possible action taken by team members to sustain performance when the reward system is individual based. Two cross-cultural approaches are visible from the study, including long-term orientation and low uncertainty avoidance. This is due to the strong adaptability organizational culture. To boost productivity, the team socialises. Hence, the project leadership can enhance the socialising process within the team by encouraging interdependent task completeness. Two approaches to project progress reporting can be adopted – individual and team based. The team-

based report covers the team's key performance indicators, while the individual report is to addresses and closes the competency gaps.

Secondly, the organizational structure to support teamwork is the responsibility of the organizational leadership, and this is reflected in the adopted leadership behaviour under the prevailing organizational culture. Thus, the outcome of the study suggest that the team's adaptive behaviour resulted in low uncertainty avoidance and long-term orientation cross-cultural domain. Though, the power distance was large, the team was still able to sustain high productive output through socialising process under a high achievement-driven and directive leadership behaviours. The organizational cultural domains to sustain this outcome have been identified from the study as "consistency, adaptability and involvement."

Thirdly, the improvement of skills and competencies of team members is the responsibility of the leadership through the adoption of both participative and supportive leadership behaviours to enable the leadership to detect the competency requirements of team members. This can be enhanced by having an organizational culture that drives "Adaptability and Consistency." Hence, this approach adopted can be implemented to reveal the underlying factors needed for high-team performance by clearly outlining the context for the team.

The first two criteria are important for an effective team composition, because empirical evidence suggest that multidisciplinary skills and attitudes in a team can enhance cognitive learning through functional diversity, thus improving the team's competence (Williams & O'Reilly, 1998). Whereas skills are abilities acquired by the individual through training, attitudes are psychological in nature, and dictates the emotional state of the individual. This is supported in this study where the socialising process was top most-ranking domain of team effectiveness.

A strong achievement-oriented and directive leadership project environment demands that team members must be skilled to enable them to achieve the planned team goals. A clear adaptive attitudinal conduct of team members can be seen from the weighting and loadings of the measured variables in cross-culture and team effectiveness. This is because both leadership and organizational culture are linked to the predictive characteristics of the organization, while cross culture and project team effectiveness are associated to the reactive characteristics of the team.

The third criterion is to ensure that team members have the right motivational attitude. However, the low moderation effect of organizational culture on cross-culture's effect on team effectiveness explains that whatsoever attitude displayed by team members is linked to adaptability, and not a total modification of the individual's cross-cultural standards by the operational organizational culture domain. Adaptational work behaviour can be encouraged through motivation. This is corroborated elsewhere (Bredin, 2008; House, 1971; Maslow, 1943), that work performance can be improved if stress is reduced while increasing job motivation. Such continual adaptational attitude can lead personality disorder if the individual has poor stress-coping responses in the long term (Umuteme & Adegbite, 2023). Personality disorder influence how people feel about "self," and strongly affect relationships through anti-social and disruptive work behaviours (Pendleton & Furnham, 2019). Could this be linked to the reason for the low loading in "group experience" domain of team effectiveness from the current study?

Although the level of age diversity was not studied, there is literature evidence that low score in "group experience" domain of team effectiveness can be linked to age diversity. Empirical evidence also suggest that employees engage in more inter-personal work-related discussions when they age within the same age bracket (Zenger & Lawrence, 1989). Thus, the group experience can be enhanced when the age diversity within the team is narrow. Consequently, the

need for adaptation requires strong motivational leadership behaviour. This is emphasising that the presence of achievement-oriented leadership behaviour must be supported with strong motivational rewards and incentives.

On the fourth team composition criterion, the right team size is strongly dependent on the nature and scope of the project. It is reported in the literature (Alladi & Iyyunni, 2015), that project team members can be less or more than 100 individuals. Since large team sizes are inevitable in projects in the oil and gas industry, to harness the benefits of multidisciplinary team size, this research suggests a blend of leadership approaches (Umuteme & Adegbite, 2022). The ranking of leadership approach in the SEM model adopted presents the opportunity for the leadership to assess how each leadership approach is correlated with the three domains of team effectiveness studied. Effective collaboration within the team can undermine the team size if the leadership strengthens the socialising process and encourages the team to improve the group experience through knowledge sharing.

A leadership that provides competence training for members of the work team must do so with a heart for the future (Pickett, 1998). However, since projects are temporal the need to utilise the skills and competencies in future projects might not be the driving force for competency training in the team. In such cases, each team member adopts other means to develop themselves. To enhance this, the leadership can provide on-the -job training and development opportunities for the team. The outcome of this research indicates that supportive leadership is low in the ranking of leadership behaviours that are frequently adopted in the project environment, hence team members must ensure they have the right skill and competencies to keep their job. The study outcome suggest that team members engages in strong socialising process to improve competence.

Another important insight from the study is the need for team members to socialise to work interpedently with other members of the team. However, the low loading in “group experience” indicates that knowledge sharing within the team is poor, and team members must depend on sources outside of the team to close critical competency gaps relating to their job description. This kind of insight enables managers to provide a framework for knowledge sharing within the team, especially during project meetings and on-site workshops. Another approach can be to add mentoring as a KPI for older staff, where the competence requirement of the mentee is assessed periodically. Since performance is highly dependent on the competences of team members, processes that drives high performance must be in place (Dyer Jr et al., 2013). The Path-Goal theory has been criticized for advancing follower dependence on leaders by using a supportive approach. However, this criticism is countered by a strong socializing process in this study. This process enables team members to collaborate effectively while maintaining a healthy level of independence from the leader. In terms of leadership implications, the focus should be on facilitating and enabling interdependence among team members, rather than just offering support. Therefore, promoting a balanced leadership approach that empowers team members is essential.

Change management is common in projects – within the team itself and in the project work scope and duration. The results shows that the team scored high in low uncertainty avoidance and adaptability cultures. This suggests that the team can adapt to change. For change management, the highest weighting score for organizational culture was 43% in adaptiveness culture where the “team members consistently and positively respond to project change process through organizational learning.” Implying further, that the leadership must encourage knowledge sharing within the team and provide career enhancement capabilities in the form of continuous on-the-job

training. Thus, the approach adopted in this research can help the project leadership in assessing the level of change management needed, and the correlational factors influencing this.

For the current study, adaptability culture is positively correlated with socialising process, productive output, achievement-oriented leadership, directive leadership, supportive leadership, and long-term orientation cross-cultural domain. Thus, the higher relative correlational values, for socialising process, long-term orientation, and directive leadership, suggest that when the need is to enhance adaptation to change within the team, emphasis must be focused on the how the coming change can enhance members' capability to work together interdependently with minimal supervision. As expected, the two main aspects of adaptation to change within the team include: (1) initiating change for improved performance and (2) instituting change management mindset within the team to enhance performance.

Recommendation for Future Studies

The outcome of this study suggests the need for further theoretical and empirical research in furtherance of the knowledge needed to design a holistic project team, where leadership is all inclusive yet driving for top-quartile performance. The study presented facts on what is obtainable in the Nigerian oil and gas project environment from the perspective of culture, leadership, and team effectiveness. As seen in the study results, what is usually obtainable is that while the leadership drive for high profitability with emphasis on cost control, the people-centred aspects of the project environment are occasionally underplayed.

Consequently, one vivid area for further research is the need for a qualitative study that can provide deeper insight into the following observations: (i) There is the need to provide further qualitative insight and deeper meaning on the relationship existing between power distance and teamwork under the controlling influence of leadership and organizational culture. The controlling

variables to be investigated can be extended to include power distance, individualism/collectivism, socialising process, organizational adaptability, supportive leadership, and participative leadership. It was equally important to investigate how power distance influence the way(s) a project leader exercises the functions of goal setting, performance evaluation approach, communicating performance feedback to team members, and team motivation; (ii) Another research need was to investigate how the diverse competences and professions in a project team influences the planning of project activities, role diversification, and job differentiation, and how these can influence the success of a project.

Equally noteworthy is the influence of individualism/collectivism culture in project teams in the presence of highly individualised expert roles. Hence, there is the need to study and unravel the main contributing factors that controls the influence of individualism/collectivism cross-cultural environment on performance-driven social integration within the team; (iii) How much of project control and ownership is resident within the team is dependent on the philosophy driving the project. Since a significant positive relationship exist between participative and directive leadership in the current study, there is the need to investigate the nature of the interplay between situational control elements within the project environment, such as reinforcements in the form of reward and punishments, and the performance of the team in general; (iv) Furthermore, the need to also investigate how low participative and supportive leadership project environment influences work/job adaptive culture among millennials in the Nigerian oil and gas industry was also emphasised; and (v) Equally stressed was the need for further investigation into how team members can be encouraged to become interested in upholding and delivering the organizational goals and objectives.

Finally, it is important to further investigate why none of the cross-cultural dimensions were significantly related with group experience domain of team effectiveness. This will provide further knowledge of the underlying factors influencing the competence of the team in an achievement-driven workplace.

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APPENDICES

Appendix A: UREC REAF Approvals

UNICAF UNIVERSITY

UREC Decision, Version 2.0

Unicaf University Research Ethics Committee Decision

Student's Name: Oghenethoja Monday Umuteme

Student's ID #: R1809D6150453

Supervisor's Name: Dr Mahdi Sadri

Program of Study: UUZ: PhD Doctorate of Philosophy

Offer ID /Group ID: O24679G25013

Dissertation Stage: 1

Research Project Title: Path-Goal Leadership Mediation Model to Investigate the Impact of Cross-Culture on Project Team Effectiveness

Comments: 4b - Exclusion criteria: please revise and include the EXCLUSION criteria and not inclusion criteria.

Decision*: B. Provisionally approved with comments for minor revision

Date: 15-Apr-2021

*Provisional approval provided at the Dissertation Stage 1, whereas the final approval is provided at the Dissertation stage 3. The student is allowed to proceed to data collection following the final approval.

UNICAF UNIVERSITY

UREC Decision, Version 2.0

Unicaf University Research Ethics Committee Decision

Student's Name: Oghenethoja Monday Umuteme

Student's ID #: R1809D6150453

Supervisor's Name: ADEGBITE Waliu Mulero

Program of Study: UUZ: PhD Doctorate of Philosophy

Offer ID /Group ID: O37445G39066

Dissertation Stage: 3

Research Project Title: Path-Goal Leadership Mediation Model to Investigate the Impact of Cross-Culture on Project Team Effectiveness

Comments: No comments

Decision*: A. Approved without revision or comments

Date: 09-Aug-2022

*Provisional approval provided at the Dissertation Stage 1, whereas the final approval is provided at the Dissertation stage 3. The student is allowed to proceed to data collection following the final approval.

Appendix B: Consent Forms

UNICAF UNIVERSITY

UU_IC - Version 2.1

Informed Consent Form

Part 1: Debriefing of Participants

Student's Name: Umuteme, Oghenethoja Monday

Student's E-mail Address: umuthoja@gmail.com

Student ID #: R1809D615045

Supervisor's Name: Dr. Adegbite Waliu Mulero

University Campus: Unicaf University Zambia (UUZ)

Program of Study: PhD

Research Project Title: Path-Goal Leadership Mediation Model to Investigate the Impact of Cross-Culture on Project Team Effectiveness

Date: 21-May-2022

Provide a short description (purpose, aim and significance) of the research project, and explain why and how you have chosen this person to participate in this research (maximum 150 words).

Studies in organisational performance indicates that the leadership style(s) determines the effectiveness and efficiency of the organisation. This study provides a framework for understanding what the leadership could have done by studying the complex interrelationship among organisational culture, leadership styles, cross-culture in teams and project team effectiveness for the purpose of auditing project team effectiveness and provide learning for future projects. You are invited to participate in this research study because you have worked or currently working in project teams in the Nigerian oil and gas industry. Your participation will involve answering structured questions in a questionnaire.

The above named Student is committed in ensuring participant's voluntarily participation in the research project and guaranteeing there are no potential risks and/or harms to the participants.

Participants have the right to withdraw at any stage (prior or post the completion) of the research without any consequences and without providing any explanation. In these cases, data collected will be deleted.

All data and information collected will be coded and will not be accessible to anyone outside this research. Data described and included in dissemination activities will only refer to coded information ensuring beyond the bounds of possibility participant identification.

I, Umuteme, Oghenethoja Monday **, ensure that all information stated above is true and that all conditions have been met.**

Student's Signature: O.M. Umuteme

UU_IC - Version 2.1

Informed Consent Form

Part 2: Certificate of Consent

This section is mandatory and should to be signed by the participant(s)

Student's Name: Umuteme, Oghenethoja Monday

Student's E-mail Address: umuthoja@gmail.com

Student ID #: R1809D615045

Supervisor's Name: Dr. Adegbite Waliu Mulero

University Campus: Unicaf University Zambia (UUZ)

Program of Study: PhD

Research Project Title: Path-Goal Leadership Mediation Model to Investigate the Impact of Cross-Culture on Project Team Effectiveness

I have read the foregoing information about this study, or it has been read to me. I have had the opportunity to ask questions and discuss about it. I have received satisfactory answers to all my questions and I have received enough information about this study. I understand that I am free to withdraw from this study at any time without giving a reason for withdrawing and without negative consequences. I consent to the use of multimedia (e.g. audio recordings, video recordings) for the purposes of my participation to this study. I understand that my data will remain anonymous and confidential, unless stated otherwise. I consent voluntarily to be a participant in this study.

Participant's Print name: _____

Participant's Signature: _____

Date:

If the Participant is illiterate:

I have witnessed the accurate reading of the consent form to the potential participant, and the individual has had an opportunity to ask questions. I confirm that the aforementioned individual has given consent freely.

Witness's Print name: _____

Witness's Signature: _____

Date:

UNICAF UNIVERSITY

UU_GL - Version 2.0

Gatekeeper letter

Address: Unicaf University, Zambia

Date: 21-May-2021

Subject: Gatekeeper Letter

Dear Sir/Madam,

I am a doctoral student at Unicaf University the Unicaf University, Zambia.

As part of my degree I am carrying out a study on "Path-Goal Leadership Mediation Model to Investigate the Impact of Cross-Culture on Project Team Effectiveness."

I am writing to enquire whether you would be interested in/willing to participate in this research.

Subject to approval by Unicaf Research Ethics Committee (UREC) this study will be using closed-ended questionnaire as the survey instrument

The aim of this doctoral research is to develop a leadership model that studies the complex relationship among the concepts in a project environment to enhance organisational performance in the Nigerian oil and gas industry, and to provide insight into the relative relevance of the dimensions adopted for this study on project success. The title is "Path-Goal Leadership Mediation Model to Investigate the Impact of Cross-Culture on Project Team Effectiveness." I am supervised by Dr. Adegbite Waliu Mulero.

You will be required to provide email addresses of staff in your project team who have at least one year project experience and are aged 30-60 years old to enable me perform my research and collect data relating to project experience in your company.

Thank you in advance for your time and for your consideration of this project. Kindly please let me know if you require any further information or need any further clarifications.

Yours Sincerely,

Umuteme, Oghenethoja Monday

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Appendix C: Survey Instrument

Survey Instrument

RESEARCH TITLE

PATH-GOAL LEADERSHIP MEDIATION MODEL TO INVESTIGATE THE IMPACT OF CROSS-CULTURE ON PROJECT TEAM EFFECTIVENESS

I am Oghenethoja Umuteme, a doctoral research student of the UnIcaf University, Zambia campus. The aim of this study is to develop a leadership model that studies the complex relationship among the concepts in a project environment to enhance organisational performance in the Nigerian oil and gas industry, and to provide insight into the relative relevance of the dimensions adopted for this study on project success. I am supervised by Dr. Adegbite Waliu Mulero. The survey instrument is comprised of two sections. The first section collects your personal data for the purpose of this study only, while the second section comprises of 15 questions which can be answered in 20 minutes. The questions are designed to collect your experience in projects in the oil and gas industry. You have been selected for this study because you are above 30 years of age and have minimum of 1 year experience in project execution. Please let me know if you require any further information or need further clarifications. A red asterisk is added to each question as a reminder that the question should be answered. Thank you in advance for your time and consideration of this project.

Consent Box: ☐ Kindly tick this box for the consent to participate in this study

SECTION I: PERSONAL DATA

This section collects your personal data for the purpose of this research only.

Age*

☐ 30-35 ☐ 36-40 ☐ 41-45
☐ 46-50 ☐ Above 50

Sex*

☐ Male ☐ Female

Ethnicity*

☐ White ☐ Asian ☐ African (Nigerian)
☐ Other African Nations ☐ Middle Eastern ☐ Other

Education Level*

☐ High School ☐ Diploma (OND) ☐ Degree/HND
☐ Masters ☐ Doctorate

SECTION II: MAIN SURVEY

Q1. Existence of inequality from top to bottom of the leadership hierarchy*

☐ 1. Never ☐ 2. Rarely ☐ 3. Sometimes
☐ 4. Usually ☐ 5. Always

Q2. There is consistent need for clarity of roles and structure of the team*

☐ 1. Never ☐ 2. Rarely ☐ 3. Sometimes
☐ 4. Usually ☐ 5. Always

Q3. Existence of in group and out group, and relationship prevails over task*

☐ 1. Never ☐ 2. Rarely ☐ 3. Sometimes
☐ 4. Usually ☐ 5. Always

Q4. Presence of high level of adaptation to change*

☐ 1. Never ☐ 2. Rarely ☐ 3. Sometimes
☐ 4. Usually ☐ 5. Always

Q5. Team's output consistently meets specified project quality (time, cost and scope) *

☐ 1. Never ☐ 2. Rarely ☐ 3. Sometimes
☐ 4. Usually ☐ 5. Always

Q6. Socializing enhances members' capability to work together interdependently with minimal supervision*

☐ 1. Never ☐ 2. Rarely ☐ 3. Sometimes
☐ 4. Usually ☐ 5. Always

Q7. Team meetings and interaction contributes positively to the learning and well-being of individual team members*

☐ 1. Never ☐ 2. Rarely ☐ 3. Sometimes
☐ 4. Usually ☐ 5. Always

Q8. The Leadership explains the key performance indicators to subordinates*

☐ 1. Never ☐ 2. Rarely ☐ 3. Sometimes
☐ 4. Usually ☐ 5. Always

Q9. The Leadership assist subordinates overcome problems that stop them from carrying out their tasks *

☐ 1. Never ☐ 2. Rarely ☐ 3. Sometimes
☐ 4. Usually ☐ 5. Always

Q10. The Leadership ask subordinates for suggestions on every decision that is made on project quality (time, cost and scope) *

☐ 1. Never ☐ 2. Rarely ☐ 3. Sometimes
☐ 4. Usually ☐ 5. Always

Q11. The Leadership consistently set challenging goals throughout the project duration*

☐ 1. Never ☐ 2. Rarely ☐ 3. Sometimes
☐ 4. Usually ☐ 5. Always

Q12. The project goals and objectives are clearly defined, and team members understand the vision of the organisation*

☐ 1. Never ☐ 2. Rarely ☐ 3. Sometimes
☐ 4. Usually ☐ 5. Always

Q13. Team members consistently respond to project change process positively through organisational learning*

☐ 1. Never ☐ 2. Rarely ☐ 3. Sometimes
☐ 4. Usually ☐ 5. Always

Q14. Team members are aligned and engaged in project activities through empowerment and continual capability/competency development*

☐ 1. Never ☐ 2. Rarely ☐ 3. Sometimes
☐ 4. Usually ☐ 5. Always

Q15. Organisational values, systems, and processes in place to enhance agreement, coordination, and integration among team members*

☐ 1. Never ☐ 2. Rarely ☐ 3. Sometimes
☐ 4. Usually ☐ 5. Always

End of Survey. Thank You