A CONCEPTUAL MODEL FOR TRANSFORMING CONSTRUCTION COMPANIES INTO FULL-FLEDGED PROJECT-BASED ORGANIZATIONS: THE CASE OF ETHIOPIA

By

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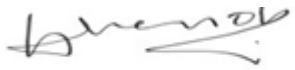

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HENOK ASFAW HAILU

DEDICATION

Dedicated to my late father, Dr. Asfaw Hailu

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ABSTRACT

Local construction firms in Ethiopia and other emerging economies face fierce competition from international construction giants, local market dynamics, and other economic setups. A plethora of studies on the Ethiopian Construction Industry (ECI) indicated that most local construction firms have failed to deliver government and private projects within a scheduled time and anticipated cost due to capacity-related problems.

Creating a conducive environment for successful projects needs a rethink of the organisational design of the parent organisations. A Project-based Organisation (PBO) is a unique organisational form suitable for implementing and managing business activities around projects. A construction firm is inherently a PBO as it executes most of its activities through projects. However, PBO design and development still depend on emerging research studies based on a limited empirical foundation. This study aimed to fill the research gap by developing a conceptual model to help transform Ethiopian construction firms (ECFs) into full-fledged PBOs by assimilating PBO characteristics.

The study used an exploratory QUAL-quant mixed methods research design. Semi-structured interviews were initially conducted with 12 selected individuals with sufficient knowledge and experience in the ECI. A thematic content analysis was performed to analyse the qualitative research data. The survey questionnaire was designed by performing an extensive literature review and enriched with the interview findings. The questionnaire was distributed to 223 ECI representatives and 180 responses were obtained. Means, standard deviations, frequencies, percentages, one-way ANOVA, and Pearson correlations were used to analyse the quantitative data.

This study confirmed the ten antecedents as PBO organisational design dimensions identified in previous studies. It also recognised six other antecedents (including unique PBO characteristics) necessary to transform ECFs into full-fledged PBOs. A transformational conceptual model (CM) was designed to incorporate the core organisational dimensions and their antecedents. The proposed model illustrates

transformation needs to begin by assessing the environment, strategic documents, and PBO characteristics. Assimilating lacking PBO characteristics into ECFs is vital to realise organisations' transformation into full-fledged PBOs.

KEY TERMS: Antecedents; Full-fledged PBOs; Conceptual models; Ethiopian construction firms; Ethiopian construction industry; Organisational design; Organisational design dimensions; PBO characteristics; Project-based organisation; Projects.

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AACRA	Addis Ababa City Road Authority
AAU	Addis Ababa University
AIE	Assessment of Internal and External Environment
ANOVA	Analysis of Variance
APBOC	Assessment of PBO Characteristics
ASD	Assessment of Strategic Documents
CEO	Chief Executive Officer
CM	Conceptual Model
COST	Construction Sector Transparency Initiative
COVID-19	Coronavirus disease of 2019
ECF	Ethiopian Construction Firm
ECI	Ethiopian Construction Industry
ECPMI	Ethiopian Construction Project Management Institute
EPMK	Executive Project Management Knowledge
ERA	Ethiopian Road Authority
FDRE	Federal Republic of Ethiopia
GDP	Gross Domestic Product
HRM	Human Resource Management
ICT	Information Communication Technology
MoUDC	Ministry of Urban Development and Construction
MRQ	Main Research Question
OPM3	Organisational Project Management Maturity Models

P1	Proposition One
P2	Proposition Two
P3	Proposition Three
PBO	Project-Based Organisation
PBOCH	PBO Characteristic
PM	Project Management
PMCK	Project Management Coal-face Knowledge
PMI	Project Management Institute
PMBOK	Project Management Body of Knowledge
PMO	Project Management Office
PPA	Public Procurement Agency
PPM	Project Portfolio Management
ProMAC	Project Management Conference
PSF	Project Success Factor
SME	Small and Micro Enterprises
SPSS	Statistical Package for Social Sciences
SRQ	Sub Research Question
Tukey HSD	Tukey's Honest Significant Difference
UNISA	University of South Africa
WHO	World Health Organisation
WTO	World Trade Organisation

CHAPTER 1: INTRODUCTION

1.1 Background

The construction industry is set to be a global engine for economic growth and recovery from COVID-19 (Oxford Economics, 2021:viii). A study presented at the World Economic Forum (2016) accentuated the construction industry's significant role in the world economy (World Economic Forum, 2016:11). According to the report, the construction industry has created numerous jobs and enrolled more than 100 million people. It also accounts for 6% of the global GDP. In developing countries, this percentage is higher than 8%. Tripathi & Jha (2019:222) also stated the additional opportunities created by the construction industry to the interlinked sectors in manufacturing, including cement, equipment, paints, bitumen, bricks, iron and steel, tiles, chemicals, and others. Projects in the construction industry provide buildings, roads, bridges, dams, and other infrastructures that support social and economic development. The industry is expected to become even more essential in the future because of several global megatrends: climate change, migration into urban areas, and a new global push for infrastructure. As a result, the industry is expected to generate an estimated revenue of $15 trillion by 2025 from the current estimated $10 trillion (World Economic Forum, 2016:11). The global construction output is expected to reach $15.2 trillion by 2030 according to Oxford Economics (2021:viii).

With about 115 million people (2020), Ethiopia is the second-most populous nation in Africa after Nigeria and the fastest-growing economy in the region, with 6.3% growth in 2020/21(World Bank, 2022). The Ethiopian government has launched a new ten-year Development Plan based on the 2019 Home-Grown Economic Reform Agenda, which will run from 2020/21 to 2029/30. The industry (primarily services and construction) accounted for most of the recent growth in Ethiopia. The contribution of the Ethiopian construction industry (ECI) to economic development improved from 4.03% to 19.29% from 2009 to 2018. Its contribution has grown by 45.8% within the last three years. ECI utilises around 60-65% of the national capital budget of Ethiopia (MoUDC, 2020:59).

Han, Kim, Jang and Choi (2010:1) stated how considerably the global construction industry had changed over the past decades regarding competition rules and delivery systems for selecting contractors, financial resource diversity, key products, and new emerging markets. Moreover, Dlungwana & Rwelamila (2005:4208) underlined that globalisation in the construction industry of developing countries is real, unstoppable, and can potentially destroy non-competitive contractors.

The consequences are that local construction firms must grow sustainably and become actual competitors to prevail in the fierce market. Also, the growth of such firms is an important indicator of a thriving economy (Abu Bakar, Tabassi, Abd. Razak & Yusof, 2012:1295). Tesha, Luvara, Samizi and Lukansola (2017:2082) described the growth of local construction firms in Tanzania as risky and unsustainable. A study by Windapo (2017:11) in South Africa indicated that construction firms were not developing and growing sustainably and needed sustainable growth strategies. Tesha *et al*. (2017:2083) also noted a similar condition in Sub-Saharan African countries where local construction firms encounter fierce competition from multinational contractors. For example, some construction firms in Ethiopia became insolvent due to the unstable and competitive business environment and their internal capacity problem. Local construction firms must rethink their organisational designs to improve their internal capacity and become competitive (Eliezer, 2019:60; Bocean, 2018:265; Wang & Lu, 2014:309).

Organisational design is a significant factor that determines the performance of organisations and how people work together in these firms. Organisations in dynamic industries, including construction firms, must be organically organised to deal with their uncertain environment. An organisational design addresses the antecedents, interactions, and consequences of various facets of an organisation, which are sometimes referred to as organisational design dimensions or elements (Turner & Miterev, 2019:488).

A Project-based organisation (PBO) is a unique organisational form suitable for implementing and managing business activities around projects. According to Abrantes and Figueiredo (2013:758), PBOs' main differentiating characteristics are flexibility and dynamism compared to traditional organisational forms. The construction industry is a classic ground for PBOs, as construction projects are complex and temporary and supported by the cooperation of various interdisciplinary projects. Wang and Lu (2014:300) also noted that PBOs have the potential to achieve higher quality, better processes, innovation in collaboration with clients and suppliers, and increased responsibility for customer needs. This study focuses on developing a model to help transform Ethiopian construction firms (ECFs) into full-fledged PBOs.

Businesses, including PBOs, need organisational design models to provide them with the agility and flexibility they need to survive and grow in a hostile economic environment (Oussama, Othmane & Zitouni, 2013:49). Moreover, Miterev, Turner & Mancini (2017a:489) raised their concern about the lack of understanding of what constitutes an all-inclusive (holistic) PBO design. Therefore, they developed a theoretical model, the Modified Star Model, initially designed by Galbraith (2014:56) in 1977 to suit PBOs(Miterev, Turner & Mancini, 2017a:479). Miterev, Turner & Mancini (2017a:489) then suggested a future empirical study on their “Modified Star Model.” Turner and Miterev (2019:495) also requested further research on the relationship between the contingency variables and organisational design dimensions. This study intends to address this discourse by developing a conceptual model to address this knowledge gap, by identifying the antecedents of organizational design of PBOs, which would help Ethiopian local construction firms design their organisations into full-fledged PBOs.

1.2 Problem Statement and Research Questions

Local construction firms in Ethiopia are facing fierce competition from international construction giants. As a result, international firms control a significant portion of the Ethiopian construction market. In contrast, local firms are limited to performing small-sized projects (MoUDC, 2020:60). Construction firms are one of the fundamental units of the construction industry (Tripathi & Jha, 2019:222). Therefore the growth of construction firms is pivotal to developing the construction industry. Ethiopian Construction Firms (ECFs) must grow sustainably and become real competitors to prevail in the fierce construction market.

The performance of a construction firm is mainly measured by the performance of its projects (Hove & Banjo, 2018:1). A report by COST-Ethiopia (2016:17) identified the poor internal capacity of construction firms as one of the reasons for project underperformance. This capacity-related problem of the firms is one of the major reasons for time and cost overruns at projects in building, road, and water subsectors (COST-Ethiopia, 2016:17). But how could this “poor capacity” of local construction firms be resolved fundamentally?

The success of a project is often as much a result of the organisational environment as the skills of the project manager (Englund & Graham, 2019:109). Creating a conducive environment for successful projects needs a rethink of the organisational design of the parent organisations. ECFs need to be transformed into organic project organisations where everyone takes responsibility for the success of the whole organisation. A Project-based organisation (PBO) is a unique organisational form suitable for implementing and managing business activities around projects (Winch, Maytorena-Sanchez & Sergeeva, 2022:146; Choi *et al.*, 2018:2; Sydow, Lindkvist & Defillippi, 2004:1475; Thiry & Deguire, 2007:649). The current unstable and vibrant business environment needs PBOs more than ever (Melkonian & Picq, 2011:455). Turning ECFs into best-performing PBOs helps to address the inherent chronic problems of organisations and their projects, unlike the tried fragmented “pain killer” solutions.

Little research has been conducted on how PBOs could navigate internal and external pressures to improve the performance of projects (Kwak, Sadatsafavi, Walewski & Williams, 2015:1652). Project-based organisations (PBOs) were initially developed to manage projects effectively without unsettling the existing organisational model. However, force-fitting the project environment into the existing mechanistic model created adverse effects and lessened the project model's positive effects (Thiry & Deguire, 2007:656). A study presented by Thiry and Deguire at the Project Management Institute (PMI) Global Congress held in Budapest in 2007 emphasized that PBO models should be adjusted to the values, culture, and mission of the particular organisation (Thiry & Deguire, 2007:656). Furthermore, Thiry (2008:1) stated that PBOs must consider the structural and other circumstances and build on them rather than fight them.

The organizational design of PBOs is an emerging stream of research. It is based on a limited empirical foundation (Turner & Miterev, 2019:489). This created the need for a contextualized PBO model. Construction firms are Project-based organisations (PBOs) and thus should strongly exhibit the fundamental characteristics of PBOs. The PBO characteristics necessary for ECFs to be transformed into full-fledged PBOs should be identified to develop a contextualized PBO model.

Focusing on developing a PBO conceptual model, this study aims to discover the key drivers that enable the transformation of ECFs into full-fledged PBOs. Accordingly, the following research questions were posed.

Main Research Question (MRQ)

How could local construction firms in Ethiopia be transformed into full-fledged Project-based organisations?

Sub-Research Questions (SRQs)

Based on the above MRQ, the study attempts to seek answers to the following sub-research questions:

SRQ1: What core dimensions of the organisational design are parts of the fundamental requirements for local Ethiopian construction firms?

SRQ2: What are the key antecedents of organisational design dimensions necessary for Ethiopian construction firms?

SRQ3: What should the conceptual model for transforming Ethiopian construction firms into full-fledged Project-based organisations be?

1.3 Research Purpose and Objectives

The study's main objective is to develop a conceptual model to transform Ethiopian construction firms into full-fledged PBOs. The conceptual model will be proposed as a reference framework for designing construction firms in Ethiopia.

Specific Objectives of the Study

(i) To identify the core dimensions of the organisational design that are parts of the fundamental requirements for local Ethiopian construction firms.

(ii) To study the key antecedents of organisational design dimensions necessary for Ethiopian Construction firms.

(iii) To develop a conceptual model to transform Ethiopian construction firms into full-fledged Project-based organisations.

1.4 Research Propositions

Building on the research questions, the research attempts to prove or disprove the following propositions:

(i) Proposition One (P1): The core dimensions of organisational design are parts of the fundamental requirements for Ethiopian construction firms.

(ii) Proposition Two (P2): The key antecedents of organisational design dimensions are necessary for Ethiopian construction firms.

(iii) Proposition Three (P3): A conceptual model does not exist for transforming Ethiopian construction firms into full-fledged PBOs

1.5 Research Methods

The research methodology for this study follows an exploratory sequential mixed-method strategy and design. The QUAL-quant data collection method starts with a literature review and qualitative interviews to explore PBO antecedents in the Ethiopian construction industry (ECI). The qualitative research will use a semi-structured interview schedule with open questions to interview purposefully selected top managers and stakeholders in the ECI with extensive knowledge and experience of ECFs and the ECI. A thematic content analysis will be performed to analyse and interpret the qualitative data.

A quantitative survey with a more significant number of research participants will then follow. The questionnaire will be designed from an extensive literature review and enriched with the interview findings. Then, the questionnaire will be distributed to an appropriate size of people from the ECI to generalise the research and reach a valid conclusion. Means, standard deviations, frequencies, percentages, one-way ANOVA, and Pearson correlations will analyse and test the questionnaire responses. Finally,

data analysis and synthesis will be used to develop a Conceptual Model (CM) to help ECFs transform into full-fledged PBOs.

1.6 Importance and Contribution of the Study

Miterev, Turner & Mancini (2017), after developing the Modified Star Model, stressed that little was known about what constitutes an all-inclusive (holistic) PBO design. This study is based on the Modified Star Model. The model was initially developed by Galbraith in 1977 and modified by Miterev, Turner & Mancini in 2017 to suit PBOs. The identified organisational design dimensions and their antecedents by the theoretical Modified Star Model need to be verified in the ECI context. Furthermore, the adequate inclusion of different characteristics of PBOs in the Modified Star Model should also be verified. This study intends to fill the information gap in the body of knowledge concerning project management and organisational design.

Through this study, construction firms and other Ethiopian construction industry practitioners should be able to understand the current underlying factors behind the underperformance and failure of ECFs and obtain an appropriate operational solution. In addition, regulatory bodies and policymakers could also obtain inputs for related policy-making and capacity-building programs to strengthen ECFs and subsequently improve the ECI.

1.7 Limitations and Scope of the Study

The findings of this study would be more suitable for local construction firms working in Ethiopia and other emerging economies since the research is being done in the Ethiopian context. The study focuses predominantly on the organisational design of firms, not on the other aspects or measures of firms. The organisational design dimensions of the local construction firms with their antecedents are covered in depth. The study focuses on the highest level, Grade I, local contractors, who have recently faced fierce competition from international construction firms.

1.8 Chapter Outline

The description below provides a summary of what each chapter covers.

Chapter 1: This chapter gives an overview of the study. It includes the background of the study and definition of Project-based organizations (PBOs), problem statement and research question(s), research objectives, research propositions, and research methods. Furthermore, the significance of the study is discussed.

Chapter 2: This chapter explains the theory and practice of conceptual models. It offers an understanding of theory, the theoretical framework and models. Then, it focuses on procedures necessary for developing conceptual models to help create a transformational PBO model for ECFs.

Chapter 3: This chapter discusses the theory and practices of PBOs. It provides an understanding of PBOs and the transformation of construction firms into full-fledged PBOs through organisational design. The salient characteristics of PBOs are explained in this Chapter. The research conceptual model and the study variables are also elaborated.

Chapter 4: This chapter addresses the research design and the methodological selection to meet the research objectives. It provides evidence on the research design selected, data sources, the research approach, sampling techniques, and other related areas.

Chapter 5: This chapter presents the research findings. It provides all results obtained from the relevant organisations and respondents during the semi-structured interviews and survey.

Chapter 6: This chapter analyses and synthesises the survey findings presented in Chapter 5 to establish whether the data respond to the research questions and research propositions.

Chapter 7: This chapter focuses on the procedures of the development of the proposed PBO model for transforming Ethiopian construction firms into full-fledged PBOs. It presents the proposed model developed based on the interview and survey results discussed in Chapters 5 and 6. The contribution of this study to the body of knowledge is discussed in detail.

Chapter 8: This chapter focuses on the study's conclusion and recommendations. The conclusion is evaluated against the original problem statement–answering research questions and research objectives.

CHAPTER 2: THEORY AND PRACTICES OF CONCEPTUAL MODELS

2.1 Introduction

The main objective of this study is to develop a Conceptual Model (CM) that could help Ethiopian construction firms trapped within different problems to be transformed into full-fledged Project-based organisations (PBOs). Developing models for problem-solving is a common practice in many disciplines. Modelling provides a logical, abstract template to facilitate analytical reasoning. Specifically, a CM is a network, or “a plane,” of interlinked concepts that provide a comprehensive understanding of a phenomenon. However, model formulation is a complex process. Therefore, it is imperative to understand models and conceptual models before commencing a conceptual model development.

This chapter focuses on model development, mainly on how CMs could be developed. Furthermore, it provides an overview of the theory and practice of CMs, which starts with a discussion of schools of thought on modelling. Then, theories, theoretical frameworks, and models are addressed in detail. After that, the meanings, benefits, and characteristics of CMs are covered. Next, a section is incorporated that deliberates the procedures of CM analysis. Project management models, which are relevant to this study, are also discussed. The last section of this chapter focuses on the salient building blocks to be utilised for CM development.

2.2 Schools of Thought of Modelling

A school of thought is a particular way of thinking of people or a group of people who share common characteristics of opinion. The three schools of thought on modelling discussed in the literature are: Model Absolutism, Model Relativism, and Model Complexity (Dalpiaz, Gieske & Sturm, 2021:3).

(i) **Model Absolutism** contemplates that only one model best describes a situation. The advocates of this school of thought believe there is a one-to-one relationship between a theory and a model.

(ii) **Model Relativism** advocates that many models can be used to describe a situation depending on the use and the user. This school of thought is based on the belief that models should be applied depending on the model's purpose and situation.

(iii) **Model Complexity**: A complex modern world requires more complex models for the utmost accuracy. But also, the models need to be easy to understand and implement. Therefore, this school of thought advocates a trade-off between Model accuracy and Model interpretability.

Model Complexity reflects the two previous schools of thought (Model Absolutism and Model Relativism). Moreover, it also offers a modern perspective that articulates that models need to be more accurate and understandable (Dalpiaz, Gieske & Sturm, 2021:3). The Model Complexity school of thought seemed most applicable to this study. The model should include different elements of the organisational design of PBOs to be more accurate and also must be easily understandable by CEOs and other leaders in Ethiopian construction firms (interpretability). Therefore, a balanced consideration of both aspects will be applied in the model development.

2.3 Theory, Theoretical Framework and Models

Research helps us to explore world phenomena (McGregor, 2018:22). Theories are formulated to explain, predict, and understand these phenomena. In contrast, a theoretical framework specifies what key variables influence a phenomenon of interest and highlights the necessity to examine how those key variables might differ and under what circumstances (Varpio, Paradis, Uijtdehaage & Young, 2020:990). In addition, models are instrumental when people cannot directly observe a phenomenon, yet it has been empirically or otherwise shown to exist (McGregor, 2018:3).

2.3.1 Theory

The word theory comes from the Greek word “theoria”, meaning “contemplation and speculation” (McGregor, 2018:21). Researchers have given different meanings to theories. McGregor (2018:21) explained a theory as

> *“ a system of ideas or suppositions tendered by theorists after they have observed and contemplated a particular phenomenon that needs to be explained, understood, or predicted.”*

Varpio *et al*. (2020:990) and Kivunja(2018:45) in a similar way defined theory as:

> *“ a set of propositions that are logically related, expressing the relation(s) among several different constructs and propositions, or it is an abstract description of the relationships between concepts that help us to understand the world.”*

Varpio *et al.*(2020:990) stressed that the more data supporting the theory, the stronger it becomes. Kivunja (2018:45) suggested that for a body of assertions, descriptions, and predictions of behaviour or relationships to qualify as a theory, it must meet the following characteristics:

> *“has to be logical and coherent ; has clear definitions of terms or variables, and has boundary conditions; has a domain where it applies; has clearly described relationships among variables; describes, explains, and makes specific predictions; comprises concepts, themes, principles and constructs; must have been based on empirical data; must have made claims that are subject to testing, been tested and verified; must be clear and parsimonious ; Its assertions or predictions must be different and better than those in existing theories; Its predictions must be general enough to be applicable to and in several contexts; Its assertions or predictions are applicable, and if applied as predicted, will result in the predicted outcome; the assertions and predictions are not set in concrete, but subject to revision and improvement as social scientists use the theory to make sense of phenomena in their world; its concepts and principles explain what*

is going on and why ; its concepts and principles are substantive enough to enable us to predict future events."

Researchers need theories for different reasons. McGregor (2018:3) explained some benefits of theories:

(i) They provide a framework for conceptualizing a study and analysing data that derive significance from the theory.

(ii) Theories are fodder for research questions and hypotheses, which individual researchers can explore or test in their studies.

(iii) They help academic fields and areas of specialization develop and advance. For example, an integrated theory may be developed through consistent theory-building methods, contributing to the efficient creation of an integrated disciplinary body of knowledge about particular aspects of the world.

(iv) Theories also provide clear insights into some aspects of reality, making practice more meaningful and effective.

(v) As scholars integrate isolated knowledge into theoretical frameworks, other areas needing investigation become evident. In this way, developed theories can stimulate discoveries and insights.

(vi) Theories can be used to give old data new interpretations and new meanings.

(vii) They can provide members of a discipline with a common language and a frame of reference for their research and practice.

(viii) Their use can inspire new responses to problems that previously lacked solutions.

McGregor (2018:3) emphasised that research relies on theory, and theory testing and development rely on research. Research involves four phases: explore, describe, identify relationships (associations), and causally explain relationships. According to McGregor (2018:3), there are three types of theories or designs related to the four

reasons for an inquiry: investigative theory, exploratory and descriptive theory; relational theory, using correlational research; and explanatory theory, using experimental, predictive and qualitative causal research. Varpio *et al*. (2020:990), in a similar manner, classified theories as descriptive, disruptive, explanatory, or predictive. In addition, Varpio *et al*. (2020:990) explained that there are grand theories that are highly abstract and tend to be concerned with broad natural or social patterns (e.g., Marxist theories of society), middle-range theories that address more specific aspects of human interactions, and micro theories that focus on individual-level phenomena.

The contingency theory serves as the theoretical foundation for this study. Van De Ven, Ganco & Hinnings (2013:405), Aubry & Lavoie-Tremblay (2018:12), Miterev, Turner & Mancini (2017a:489) and other researchers have agreed that contingency theory is the dominant theoretical construct for the design of PBOs. A contingency theory considers that the performance of an organisational unit results from the alignment between an internal arrangement and an external context.

2.3.2 Theoretical framework

A theoretical framework is a logically developed and connected set of concepts and premises developed from one or more theories that a researcher creates to scaffold a study (Varpio *et al.*, 2020: 990). Grant and Osanloo (2014:13) and Adom, Hussain and Joe (2018:438) described a theoretical framework as a guide or ‘blueprint’ for research. It serves as a guide to build and support a study and provides structure to define how the research should be approached philosophically, epistemologically, methodologically and analytically.

To build a theoretical framework, a researcher must define concepts and theories that will ground the research, unite them through logical connections, and relate the concepts to the study (Varpio *et al.*, 2020: 990). Without a theoretical framework, the structure and vision for a study are unclear, like a house that cannot be constructed without a blueprint. A theoretical framework is a structure and support for the study's rationale, problem statement, significance, purpose, and research questions. It provides

a grounding base, or an anchor, for the literature review and, most importantly, the methods and analysis (Grant & Osanloo, 2014:13).

Selecting a theoretical framework requires a deep and thoughtful understanding of the research problem, purpose, significance, and research questions. It is imperative that the problem, purpose, significance, and research questions are tightly aligned and intricately interwoven for the theoretical framework to serve as the foundation of the study and guide the choice of research design and data analysis (Grant & Osanloo, 2014:17).

Grant & Osanloo (2014:19) and Adom, Hussain and Joe (2018:439) developed a list of questions to be answered by the researcher in selecting an appropriate theoretical framework for the study.

(i) What discipline will the theory be applied to?
(ii) Does the theory align with the methodology plan for the study?
(iii) Is the theory to be selected well-developed with many theoretical constructs?
(iv) Have specific concepts or theoretical principles been selected to meet the study's objectives?
(v) Does the problem of the study, the purpose, and the importance of the study correlate with the theoretical framework?
(vi) Can the theory be used hand-in-hand with the research questions for the study?
(vii) Does the theoretical framework inform the literature review?
(viii) Does the data analysis plan agree with the selected theoretical framework?
(ix) Does the theoretical framework undergird the conclusions and recommendations based on the data analysis?

The Modified Star Model, the theoretical framework selected for this study, meets the above criteria. In addition, the research problem, questions, purpose, and importance of the study align with the components (organisational design dimensions of PBOs and their antecedents) of the Modified Star Model.

2.3.3 Models

Mayr & Thalheim (2020:21) opined that modelling is as old as human civilization. Organisational models represent a set of components of a process, system, or subject area generally developed for understanding, analysing, improving, and replacing processes (Stanford, 2007:20).

Elangovan and Rajendran (2015:2) clarified models as representative illustrations and heuristic devices that visually explain the concepts and theory. McGregor (2018:41) described models as

> *"…visible or tangible renderings of an idea that is difficult or impossible to display just in words. The actual image as well as the attendant mental images (the mind's eye) better helps people access deep and complex phenomena. Models serve to represent both complex theoretical formulations and interrelationships between multiple variables and constructs."*

Models can be verbally, physically, and symbolically (graphically) illustrated. They are usually depicted as maps, charts, graphs, balance sheets, diagrams, and flowcharts using a combination of words, lines, symbols, images, arrows, and shapes. Besides, using a pictorial format, models can be mathematical or statistical formulas or algorithms whereby scholars capture a formal theoretical system through mathematical representation employing numbers, letters, and mathematical symbols (e.g., Einstein's relativity theory equation, E = mc^2); physical miniatures of larger entities (e.g., a scaled model of the planetary system); and computer simulations (e.g., an engineering model of the behaviour of houses in earthquakes) (McGregor, 2018:43).

Nowadays, researchers can create simple or complex statistical models of reality using computer software packages due to advances in statistical modelling tools. Examples include multiple regression models, path analysis models, and structural equation models (McGregor, 2018:43). This study focuses on developing a conceptual model.

2.3.3.1 Conceptual Model

A Conceptual Model (CM) is a network, or “a plane,” of interlinked concepts that together provide a comprehensive understanding of a phenomenon or phenomena. The concepts that constitute a CM support each other, articulate their respective phenomena and establish a model-specific philosophy (Jabareen, 2009:51).

Mayr & Thalheim (2020:8) and Thalheim (2011:2) explained conceptual modelling as modelling with concepts. They identified a concept as:

> *“ a mental construct formed by mentally combining characteristics of general or abstract ideas gained by cognition. It is seen as a pair of intentions and its extension.”*

The cognitive processes generate, use, and transform mental representations of the world. The representations are “intentional” because they refer to or are about something. The intention defines the concept, and the extensions include objects that could be used as an example of the intention.

According to Thalheim (2011:2), the purpose of a CM covers a variety of intentions and aims, including perception support for understanding the application domain, explanation and demonstration for understanding an origin, preparation for management and handling of the origin, optimization of the origin, hypothesis (or proposition) verification through the model, construction of an artefact, control of parts of the application, simulation of behaviour in certain situations, and substitution for a part of the application.

Furthermore, a CM is the mapping of an origin. It reflects some of the properties observed or envisioned for the origin. Thalheim (2011:3) used the self-explanatory CM space diagram (Figure 2.1) to explain CMs. A CM uses concepts; therefore, the model space is characterised by its origin, concepts, representation of model elements, and

user or stakeholder comprehension. These model elements cannot be considered in isolation. The four aspects of a CM space are illustrated in Figure 2.1 below.

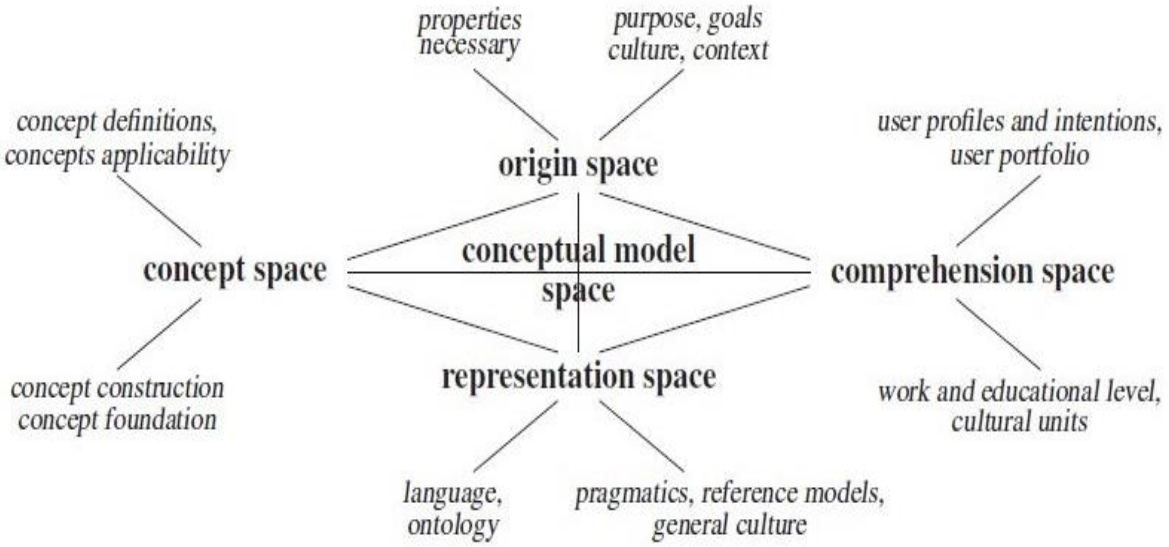

Figure 2.1: Four aspects of a CM space

Source: Thalheim (2011)

Thalheim (2011:3) described the four aspects of CMs as the origin aspect through necessary properties, the foundation aspect through concepts, the representation aspect through language and the user aspect through user comprehension. Finally, Thalheim (2011:12) stressed that these four aspects are interwoven.

The CM development process of this study follows Thalheim's (2011) four aspects of a CM space: understanding the organisational design of Ethiopian construction firms (Origin space), the construction of different concepts that could help to realise the transformation of Ethiopian construction firms into full-fledged PBOs (Concept space), using the language of the scientific community of organisational design and project management fields (Representation space), and accordingly, design the model in a way to be easily understandable by CEOs and other leaders of construction firms (Comprehension space).

I. Purposes of a Conceptual Model

A primary objective of Conceptual Models (CMs) is to convey the basic principles and functionality of the system it represents. A CM must be developed in such a way as to provide an easily understood system interpretation for the model's users. According to Jabareen (2009:58), CMs offer different kinds of advantages, including:

(a) Flexibility – A CM is based on flexible conceptual terms rather than rigid theoretical variables and causal relations.
(b) Capacity for modification - CMs can be reconceptualised and modified according to the evolution of the phenomenon in question or as a result of new data and texts that were unavailable at the time the framework was first developed. The idea is consistent with the fundamental premise that social phenomena are not static but evolutionary.
(c) CMs emphasize understanding instead of prediction - CMs help to understand phenomena rather than predict them.

The CM developed in this study intends to use flexible conceptual terms rather than rigid theoretical variables. The modelling is designed to be open for future modifications. Also, the model is developed to enable the users to understand their internal and external environment for more accessible adaptation.

II. Characteristics of Conceptual Models

Mayr & Thalheim (2020:10) explained the key characteristics of CMs as follows:

(a) CMs are related to a collection of "origins" or "originals": A model is a model of something, for example, a proxy of a natural, artificial, or mental original; in particular, the original of a model may be a model itself. As originals may change in time, the original and model relationship may also change. Models are the results of cognitive processes. The mission of a model is transporting a "cargo," namely the original's perceived properties considered relevant within the

perception's context. Transport or transfer occurs with the usage of the model; precision and transport warranties distinguish models and metaphors.

(b) **Concern and usage**: Three main concerns are coupled to most kinds of modelling, distinguished as understanding; communicating; agreeing as a process of consolidation, manifestation, and consensus. The usage of a CM will be directed by its first concern. However, this is not mandatory because users can do what they want with a model.

(c) **Purpose and function**: A CM serves the purpose: of understanding, analysing, and assessing the origin; designing and planning a new original to explain or predict properties of the original and communicating perceptions and ideas.

(d) **Domain and context**: Concerning conceptual modelling, the following three domains can be distinguished: the domain of interest, experience, and perspective of a human; the application domain or world domain to which a community of practice refers; and the domain of discourse among some particular people.

(e) **Focus**: A CM reflects, for a given purpose, the "relevant" but not all aspects of its origin (al).

(f) **Representation**: CMs transport semantics by terms that denote concepts. CMs need an associated "physical" representation. Examples are an acoustic signal, a toy railroad, a diagram, a spoken or written natural language text, and so forth. The representations should be understandable by the actors involved (humans and systems), dependable, and thus be agreed upon within the community of practice.

(g) **Concept space**: Conceptual modelling demonstrates a solid relation to semantics. Semantics is the meaning of a word, phrase, or text. "Semantic modelling" using terms associated with concepts from the "concept space" is partly used as a synonym for Conceptual Modeling: A community of practice agrees on the

concepts and terms as well as on the association between these concepts and terms, and thus establishes an instrument for communication. The terms used for representing models thus have a “priori semantic” meaning.

(h) Concept relationship: Concepts can be related to each other. There could be different types of relationships, such as many-to-one or one-to-one.

Understanding the above unique characteristics of CMs has paved the way for a broader understanding of CMs and their development.

III. Conceptual Model (CM) Analysis

A Conceptual Model (CM) analysis explains the process of theorising or reasoning for building CMs. Jabareen (2009:53-55) explained the procedures of CM analysis as follows:

Phase 1: Mapping the selected data sources

The first task for CM development is to chart the continuum of multidisciplinary literature regarding the study in question. It includes identifying document types and other data sources, such as existing practices and empirical data. It should start with a detailed review of the multidisciplinary texts. It is also recommended to undertake initial interviews with specialists, practitioners, and scholars from different disciplines whose work centres on the targeted phenomenon. In addition, other literature on organisational design and project management also focused on the organisational design of PBOs will be gathered. Initial interviews with Ethiopian Construction Industry (ECI) practitioners and scholars will be conducted.

Phase 2: Extensive reading and categorizing of the selected data

This phase focuses on carefully reading the selected data and categorising it by discipline, the scale of importance, and representative power within each discipline. This process extends the effectiveness of the inquiry and ensures proper representation of

the different disciplines. Regarding this study, an extensive literature review will be performed on PBOs and their design.

Phase 3: Identifying and naming concepts

This phase is used to iteratively read and reread the selected data and “discover” new concepts. Typically, the result would be a list of numerous competing and sometimes contradictory concepts. Moreover, this method allows concepts to emerge from the literature. This phase in the study will discover distinct concepts for the organisational design of PBOs.

Phase 4: Deconstructing and categorising the concepts

At this stage, the researcher will deconstruct concepts and identify main attributes, assumptions, and functions. Constructs are organised and categorised according to their characteristics and epistemological, ontological, and methodological roles. In addition, the researcher will iteratively deconstruct the previously identified concepts further and categorise them as required.

Phase 5: Integrating concepts

This phase aims to integrate similar concepts into categories. The action reduces the number of concepts and allows the researcher to manipulate concepts according to their features and epistemological, ontological and methodological roles. Some concepts will repeatedly be integrated and categorised.

Phase 6: Synthesize and resynthesize until it all makes sense

This phase aims to synthesize concepts into a CM. It needs openness, flexibility, and tolerance of the theorising process for new concepts and theories to emerge. This process is iterative and includes repetitive synthesis and resynthesize until the researcher recognises a plausible CM.

Phase 7: Validating the CM

This phase aims to validate the CM. First, the researcher must ensure that the proposed model and its concepts make sense to practitioners and scholars. Presenting at a conference, a seminar, or some other academic framework provides an excellent opportunity for researchers to discuss and receive feedback. Therefore, the model as the outcome of this research will be presented at a conference or seminar to receive feedback from a technological community focused on project management and organisational design.

Phase 8: Revisiting the CM

A model or a theory representing a multidisciplinary phenomenon will always be dynamic and need to be revised according to new comments, insights, literature, and other feedback. Therefore, the model developed in this study will be designed to be open to future insights emerging from the organisational design and project management fields.

2.4 Model Building in Project Management

The PMBOK® Guide explains a model as a thinking strategy to explain a process, framework, or phenomenon (PMI, 2021:155). The guide also emphasizes the value of models.

> *" A model helps to explain how something works in the real world. Models can shape behaviour and point to approaches for solving problems or meeting needs."*

Project management models provide a framework for responding to a situation or a project scenario. Unfortunately, traditional project management models are ineffective in the current dynamic, inconsistent, and complex environment. For this reason, new adaptive project management models are currently emerging. Understanding the value of project management models to the project management community, the recent PMBOK® Guide (PMI, 2021) has included a separate section for models.

Situational leadership, Motivation, Communication, Complexity, Change management, Conflict, Project team development, Planning, Negotiating, Process groups, and Stakeholder salience are among the commonly used project management models (PMI, 2021:155-171). Some of the mentioned models are specific to project management, while others are more generally relevant to the world of work.

Project management and other advanced models are expected to achieve the requirements listed below to adequately represent the problem and its solution (Liu, Yu, Zhang & Nie, 2011:157).

(i) The adopted models have to be sufficiently representative of the studied reality.
(ii) The models should not be too complex because they can hardly be implemented if this happens.
(iii) The validity of the models should be tested (for statistical models) and verified (for CMs) (Model Validation).
(iv) The models should be transparent, making the conclusions understandable by any professionals in the field (Model Transparency)
(v) The models to be built should be oriented to support the process of decision-making and training in each professional area

This study will attempt to develop a conceptual model representative of the Ethiopian construction business context and its project environment. Also, the model will be designed to be easier to understand and implement.

2.5 Salient Building Blocks for Conceptual Models

The study on the theory and practices of CMs in this chapter provided the building blocks for CM building. The salient building blocks to be used in the model development include the foundational thought and the aspects to be considered during model development procedures. Table 2.1 lists the building blocks on which the research is based, their descriptions and the literature sources.

Table 2.1 Salient Building Blocks for Conceptual Model (CM) Building

Building Blocks	Description	Sources
School of thought: Model Complexity school of thought was the foundational thought for the model development of this study	Model complexity is a contemporary school of thought articulating that models need to be adaptive, easy to understand, and more accurate.	Dalpiaz, Gieske & Sturm (2021)
Primary considerations in model building	Understand the organisational design of Ethiopian construction firms **(Origin space)**; Construct different concepts to realise the transformation of Ethiopian construction firms into full-fledged PBOs (**Concept Space)**; Use the languages of the scientific community in organisational design and project management fields **(Representation space)**; Make the model understandable for managers in the ECI **(Comprehension space)**.	Thalheim (2011)
Procedures to follow in model building	The listed eight steps will be followed to build the CM: Mapping the selected data sources; Extensive reading and categorizing of the selected data; Identifying and naming concepts; Deconstructing and categorizing the concepts; Integrating concepts; Synthesis, Resynthesizing, and making it all make sense; Validating the CM; Revisiting the CM.	Jabareen (2009)

2.6 Chapter Summary

The chapter provided a comprehensive overview of the theory and practice of CMs. The different schools of thought on modelling were explained at the beginning of the chapter. Theories, theoretical frameworks, and models were subsequently examined. Then the meanings, benefits, and characteristics of CMs were detailed. This chapter also included a section on the analysis procedures of CM before project management models were discussed. Finally, the salient building blocks for CM development were listed and defined.

The knowledge acquired in this chapter regarding the theory and practices of CMs will be utilised in developing the CM for transforming Ethiopian construction firms into full-fledged PBOs. Chapter 3 will provide an in-depth discussion of the theory and practice of Project-based organisations (PBOs).

CHAPTER 3

THEORY AND PRACTICE OF PROJECT-BASED ORGANISATIONS (PBOs)

3.1 Introduction

This chapter focuses on the theory and practices of Project-based organisations (PBOs), starting with explaining organisations and their significance. Next, different categories of organisations are discussed. Then, the foundational concepts of organisational design are addressed in detail. Finally, the seminal organisational design models are discussed.

Among all the different types of organisations, PBOs are the focus of this study. Project-based organisations (PBOs) can respond to dynamic, open, inconsistent, changing, and complex construction business environments. A construction company is inherently an example of a PBO as it executes most of its activities through projects with short life cycles. The salient characteristics of PBOs are explained in this Chapter.

The current status of construction firms in Ethiopia as PBOs is discussed in detail. The need for transforming Ethiopian construction firms (ECFs) into full-fledged PBOs is also addressed. Different types of project maturity models related to organisational design are discussed. The theoretical underpinning of this study, the Modified Star Model, is explained in detail with its components, organisational design dimensions and their antecedents. A discussion of the research conceptual model is the final section of the chapter.

3.2 Theory and Practice of Organisation Design

Organisations play a leading role in the modern world. Daft (2020:18) stressed how deeply organisations shape the lives of people. Bill Gates, who built Microsoft into a global powerhouse, explained the modern organisation as one of the most effective means to allocate resources. In addition, organisations transform countless ideas into customer benefits (Daft, 2012:13). Other studies claim organisations as the most invaluable institutions in modern society (Greenwood, Hinings & Whetten, 2014:1206).

Organisations are systems of coordinated action among individuals and groups whose preferences, information, interests, and knowledge differ. However, different understandings of an organisation have always preserved some mutual features. Typically, an organisation is viewed as a multi-agent system with system-level goals towards which the constituent agents' efforts are expected to contribute (Puranam, Alexy & Reitzig, 2014:3). Previously organisations considered themselves autonomous and separated while trying to outdo other companies. However, more organisations have recently started to view themselves as part of an ecosystem (Daft, 2020:18).

Daft (2020:14) explained organisations as goal-directed social entities designed as deliberately structured and coordinated activity systems linked to the external environment. He emphasized that the vital elements of an organisation are not a set of policies and procedures or a building. Instead, organisations are created with people and their relationships with each other. It exists within the interaction of people to execute essential functions that help achieve goals.

Daft (2020:14) further explained the importance of organisations as

> *"...bringing together resources to achieve desired goals and outcomes; producing goods and services efficiently; facilitating innovation; using modern manufacturing and information technologies; adapting to and influencing a changing environment; creating value for owners, customers, and employees; accommodate on-going challenges of diversity, ethics, and the motivation and coordination of employees."*

Some organisations are small family-owned shops, while others are large multinational corporations. Some manufacture products such as computers or automobiles, whereas others provide banking, legal representation, or medical services. Another classification of organisations includes for-profit businesses and non-profit organisations. There are some significant differences to bear in mind. The major one is that the activities of managers in the former type are directed primarily at producing goods and services mainly to get profit for the shareholders of the company. In contrast, the case is different for managers in non-profit organisations. They do not face such a constraint but may encounter many other issues, such as the struggle to secure funds (Daft, 2020:15).

For some scholars, an organisation is not considered an end in itself. They view it merely as a vehicle for accomplishing the strategic tasks of the business (Kates & Galbraith, 2007:1). But other researchers argue that an organisation by itself is both an articulated purpose and an established mechanism for achieving it. Both parties agree that organisational purposes and mechanisms have become increasingly complex (Snow, Miles & Miles, 2006:14). The world is changing more rapidly than ever, and managers are responsible for positioning their organisations to adapt to new needs. Some challenges today's organisations and managers face are globalisation, intense competition, rigorous ethical scrutiny, rapid response rates, the digital workplace, and increased diversity (Daft, 2020:13).

Chinowsky (2011:4) categorised organisations along a spectrum from continuous-process to Project-based organisations (PBOs), as depicted in Figure 3.1. Chinowsky (2011:4) explained the details of his spectrum:

> *"…continuous-process organisations are the ones that are based on providing consistent services over an extended period with minimal changes to the product or service. Hospitality and consumer products share this end of the spectrum as each emphasizes market share growth through experiential or marketing-based efforts. At the opposite end of the spectrum, we see organisations that centre on unique, large project delivery. Engineering and construction firms anchor this end of the spectrum."*

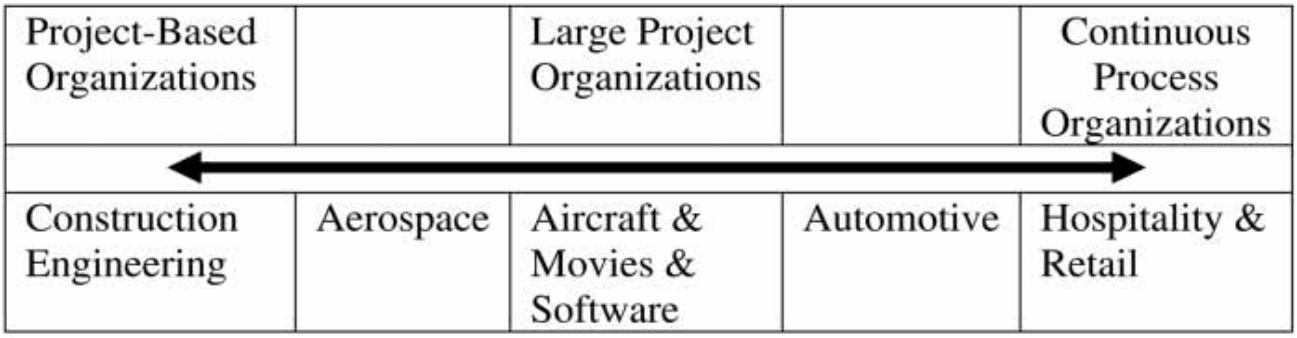

Figure 3.1: The spectrum of organisation types

Source: Chinowsky (2011)

3.2.1 Organisational Design

Organisational design is a significant factor in determining an organisation's performance and how people work together in organisations (Burton & Obel, 2018:1). It further affects the performance and behaviour of millions of workers and organisations, the well-being of economies, and the aggregate productivity (Van De Ven, Ganco & Hinnings, 2013:395). Daft (2020:54) also underlined how organisational design significantly determines its success. Van De Ven, Ganco & Hinnings (2013:393) claimed that much about organisational design has been learned and even more needs to be learned. The design of an organisation has a considerable impact on how organisational participants behave and on the functioning and effectiveness of the whole organisation (Mansfield, 2013:4). This is why many leaders are rethinking their organisational designs. They have recognised that organisational design can be a powerful way to boost performance and keep up with ever-changing markets. Felin & Powell (2016:78) stressed the power of organisational design, indicating how managers can harness new organisational forms to build capacity for sensing, shaping, and seizing opportunities.

Organisational design is a well-established research field within the literature focusing on different organisational forms, the array of design strategies available to managers, and their internal and external contingencies (Miterev, Turner & Mancini, 2017a:479; Turner & Miterev, 2019:488). Aubry & Lavoie-Tremblay (2018:12) argue that the organisational design field has been neglected by scholars of organisational theory and management but recently acquired a significant interest in the project management

field. Aubry & Lavoie-Tremblay (2018:14) had stressed the existence of a strong linkage between organisational theories and organisational design.

Restructuring and focusing mainly on structural aspects is not organisation design and is unlikely to be successful. Someone who had been involved in this kind of restructuring would have encountered stories of confusion, frustration, stress, and tumbling motivation, morale, and productivity. Focusing on a structure is neither enough nor the right starting point (Stanford, 2007:4, Kates & Galbraith, 2007:9). The structure is only one aspect of an organisation’s design. Most organisational design efforts devote too much time to drawing organisational charts and too little to rewards and processes. The structure is usually overstated as it affects power and status. A change to it is most likely to be reported in the business press and announced throughout the company. But, in a dynamic business environment, the structure is becoming less critical while processes, rewards, and people are becoming more important.

Therefore, organisational design determines an organisation's structures and processes (Mccaskey, 1974:13). The difference between organisational design and organisational structure could be confusing. Considering structure as the organisation's basic framework, the organisation's skeleton and shape usually signify the organisational chart. However, an organisation's design relates to the various components that make up a structure. If continuing the biological metaphor, the organisational design is the muscular, respiratory, and cardiovascular systems that move things around the body and ensure its function. Structure doesn't exist without the other design elements. All the elements need to be coordinated and work together (Cunliffe, 2008:2). Without organisational design theory, people cannot generalise and use their accumulated knowledge to design effective and efficient organisations that will serve their purpose (Burton & Obel, 2018:11).

For many years, organisation design was a sub-field of major disciplines focusing on organisations and management. In the early 1960s, a conference on the organisational design was held at the University of Pittsburgh. Several leading management

researchers convened to discuss organisational design issues and identified around 200 variables involved in organisational design. Another momentous conference was organised with scholars at the University of Southern Denmark in May 2005 (Burton & Obel, 2018:11). Since then, several studies have been published focusing on organisational design matters. So much so that it has now become a fundamental repository for knowledge on planning, building, and organisational change.

Furthermore, organisational design needs the skilful application of knowledge. The pertinent knowledge base for this is diverse, including concepts, approaches, and research findings from research fields, including economics, psychology, logistics, information technology, and change management. Most design issues are re-design issues encompassing the analysis of the current organisation, the identification of misalignment and other problems, and alterations made to increase effectiveness. Thus, organisational design can be considered a "scientific art", and expert practitioners must have a profound understanding of how organisations work and how they can and must be changed (Snow, Miles and Miles, 2006:3)**.**

An organisation is a system of interconnected parts; as a result, the design of one subsystem or procedure has consequences for other parts of the system. Furthermore, the criteria by which a system design is to be evaluated (social responsibility, survival capability, economic performance, and the personal growth of organisational members) cannot be maximized simultaneously. Therefore, the design of a human social organisation can never be perfect or final.

In summary, the design of organisational activities devises a complex set of trade-offs in changing environments, people, and values (Mccaskey, 1974:13). Therefore, Burton and Obel (2018:3) expressed organisational design as a systematic approach to aligning structures, processes, people, leadership, culture, practices and metrics enabling organisations to achieve their mission and strategy. The basic premise was that no one best way of organisational design existed and that different organisations are not equally efficient or effective.

Mccaskey (1974:19) further explained the design choices as follows:

> *"…organisational design choices are trade-offs between a good fit to the task environment and people characteristics, monetary and human costs, and short-term and long-term consequences. Such a design is never perfect or complete. Instead, an organisational design seeks to build knowledge about and provide guidelines for designing more efficient and more human organisations."*

According to Stanford (2007:23), the principle of an organisational design is that form-follow function models and approaches follow when the boundaries—the things that circumscribe the form—are known. He also explained organisational designs as an intentional construct and that an organisation can be purposefully designed and achieves successful results if a thoughtful design process is followed during the development. An effective organisational design optimises the organisations and its members' performance by ensuring that work activities, tasks, and people are organised to achieve their goals.

Accordingly, an efficient organisational structure and design would use the most appropriate resources (e.g. money, materials and people) to achieve its goals (Cunliffe, 2008:2). Thus, an organisational design concept refers to both the process of performing the design and the resulting organisation (the thing). Minor adjustments in organisational design are continuously being made during the life of an organisation. Still, the time for significant focus on organisational design is in the organisation's early life or when considering expanding or changing the organisation's mission (Mccaskey, 1974:13).

Mccaskey (1974:19) listed the most important issues raised in approaching an organisational design problem as follows:

- The uncertainty of the task environment in which the organisation operates.
- The ways the organisation becomes mechanistic and organic.
- The way the sub-tasks are divided and the organisation is differentiated.

- The kind of people in the organisation.
- The activities to be coordinated and integrated.

Van De Ven, Ganco & Hinnings (2013:395) stated that the domain of organisations is changing, and so must the approaches to organisational theory and research. According to Van De Ven, Ganco & Hinnings (2013:394), there is a recent revival in understanding the complex design of organisations. His appreciation fuels the idea that design is a central and enduring problem of management practices, and there is a growing demand for robust theorising and empirical research on new forms of organising in an ever-more-dynamic and complex situation.

Stanford (2007:33) described Fujitsu leaders' view of a well-designed organisation:

> *"It has well-defined processes. There are clear links between the functions. We can fit between strategy, delivery, and output. People in the organisation understand their roles and can play their part without stress. Works flow smoothly through the organisation and the outcome meets customer expectations."*

A convenient approach for studying what we know about designing organisations is the continuum from mechanistic to organic patterns of organising. Most suited to confident and stable environments, the mechanistic form defines the traditional hierarchical pyramid where top management tightly controls program activities. On the other hand, in an unstable and uncertain environment, the organic organising pattern is more collegial and embraces flexibility in rules, decision-making authority, and procedures. (Stanford, 2007:33). But, of course, there are many more than these two types of organising patterns, and these two should be considered the ends of a continuum of organising patterns (Stanford, 2007:34).

Most organisations are likely to contain both mechanistically and organically organised units. How widely the units should range on the mechanistic and organic continuum is part of the question of differentiation. The question is how significant the differences

between units are in terms of structures, types of people, and thinking patterns. Overall, organisations in mature and stable industries contain units that face more or less well-defined and particular sub-environments. Therefore, to meet environmental demands, the units should generally be more mechanistically organised, and the organisation as a whole would be less differentiated (Stanford, 2007:34).

Organisations in dynamic industries need to have some units organically organised to deal with a particular uncertain sub-environment. At the same time, they must devise more mechanistic units (for example, production and accounting) to face more stable sub-environments. To cover the range of sub-environments, the manager or organisation designer creates or allows the development of more significant differences between the units. In addition, the organisation tends to create more job roles (occupational differentiation) and more levels (vertical differentiation) in response to environmental diversity(Stanford, 2007:22).

The organisation, therefore, becomes more highly differentiated. The opposite of differentiation is the need to integrate and coordinate the activities of different parts of the organisation. The greater the differentiation, the harder it is to integrate. The choice of a particular integrating mechanism, such as liaison in addition to rules, signals the manager or designer's decision to expend a certain amount of effort to coordinate activities. Concurrent with designing the extent of differentiation in an organisation, a manager must consider what effort at what cost will be needed to integrate those differences. The greater the differentiation is the more elaborate and costly the mechanisms needed for integration(Stanford, 2007:22).

3.2.2 Organisation Design Models

A model can be expressed as a representation of a set of components of a process, system, or subject area generally developed for understanding, analysing, improving or replacing obsolete processes(Stanford ,2007:20).Stanford (2007:20) further explained the benefit of an organisational design model as:

> *"…without a model, it is hard for a CEO or other senior executives to describe or think about their organisation holistically. They tend to think about only the structures (the organisation chart). With this narrow focus, they cannot see the necessary alignment of all the elements that comprise a fully functioning organisation."*

Stanford (2007:20) opined that a good starting point for organisational design is approaching the organisation as a system. He suggested starting with one organisational system and lining up several possible models. The challenge for organisational design theory is to create predictive models for future organisational design (Burton & Obel, 2018:3). New models that go beyond providing general advice to existing organisational designs are needed. Over the years, many models have been developed to understand the various elements included in the design models. Thus, the objective has been to provide a framework to understand an organisation's design (Stanford, 2007:216).

The early contributors to organisational theories were criticised for relying on only a few contingency variables and organisational design choices, thereby not reflecting the actual complexity of organisations. The organisation design field has thus tried to respond with different types of holistic models to fill the gap (Van De Ven, Ganco & Hinnings , 2013:400). Thus, the design of an organisation can be based on different seminal models (Van De Ven, Ganco & Hinnings, 2013:482) including:

- Galbraith's information processing or Star Model (1977).
- The McKinsey 7-S Framework (1979).

- Nadler and Tushman's congruence model (1980).
- Hackman and Oldham's job diagnostic survey (1974).

The seminal models have common characteristics: they are all built on a contingency perspective; call attention to coherence among the organisational design dimensions; and include similar components, for example, structures, processes, and people. The key message of these and other similar models is that practitioners and organisational design scholars should consider a wide range of organisational dimensions and pay attention to their internal coherence and external fit (Miterev, Turner & Mancini, 2017a:481). Although such models were shown to be too simplistic to reflect current complex situations, they can be valuable as diagnostic frameworks to identify appropriate design choices for new organisational forms. In addition, the design of a PBO is a new area and could benefit from basic concepts of organisational design and theory. In summary, these seminal models could offer the first insight into PBO design (Miterev, Turner & Mancini, 2017a:482).

3.2.2.1 The McKinsey 7S Framework

Typically, models for organisational design are those initiated by consulting firms, such as McKinsey and other companies (Stanford, 2007:21). The McKinsey 7S strategic model contemplates strategy, structure, systems, shared values, style, staff, and skills. Strategy, structure, and systems include the hardware, style, and staff. Skills consider the organisation's software applications, while shared values bind these features together (Peh & Low, 2013:105). According to the McKinsey 7S model (illustrated in Figure 3.2), strategy allocates a firm’s scarce resources over time to reach its goals. Structure refers to the administration of the firm, its departments, reporting lines, areas of expertise, and responsibilities (Peh & Low, 2013:105).

On the other hand, (Peh and Low, 2013:116) also described systems as processes, procedures, and outlines, such as financial systems, hiring and promotion practices, and information systems that characterise how vital the work is to be done. Skills comprise the capabilities and competencies of personnel and the organisation. Shared values represent the interconnecting centre of the model and describe the

superordinate goals that the organisation stands for. Beliefs guide employees toward “valued” behaviour. Staffs include people resources and how they are developed, trained and motivated in terms of the number and type of staff within the organisation. Finally, style refers to top management's cultural and leadership approach and the company’s overall operating approach (Peh & Low, 2013:116).

Mintzberg (1979) grouped design decisions under the design of positions (job specialisation, behaviour formalisation, training, and indoctrination), design of superstructures (unit grouping and size), and design of lateral linkages (planning and control and liaison devices). The design also includes designing decision-making systems (vertical and horizontal decentralisation) (Miterev, Turner & Mancini, 2017b: 531).

The popularity of McKinsey’s 7S Framework lies in the fact that both soft and hard elements have been considered, and their interactions are firmly established. The McKinsey 7S model is critiqued for being too rigid to handle the dynamic changes of the competitive environment. Organisations need more agility, speed, and capacity to cope with uncertainty to prosper (Peh & Low, 2013:116). Stanford (2007:23) also criticized the model for not having feedback loops and performance variables.

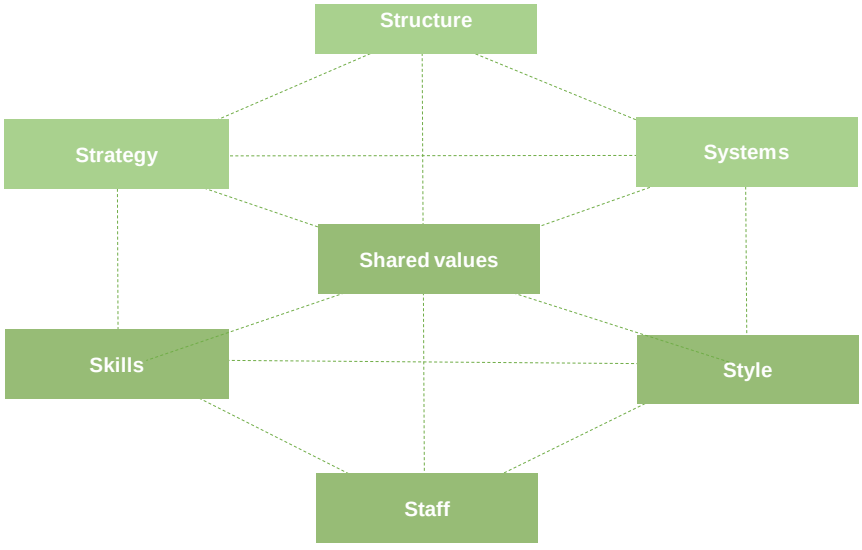

Figure 3.2: McKinsey‘s 7-S Model

Source: Peh and Low (2013)

3.2.2.2 Nadler and Tushman's Congruence Model

Viewing the organisation as an open information processing system, Nadler and Tushman(1980) developed a congruence model comprising formal organisational arrangements, informal organisational tasks, and individual components driven by strategy, as illustrated in Figure 3.3 (Stanford, 2007:23). The model is a powerful instrument for identifying the root causes of performance problems. It can also be used as an initial point for identifying how to fix them. In addition to external fit, an internal alignment among the design choices is required (Miterev, Turner & Mancini, 2017b: 531).

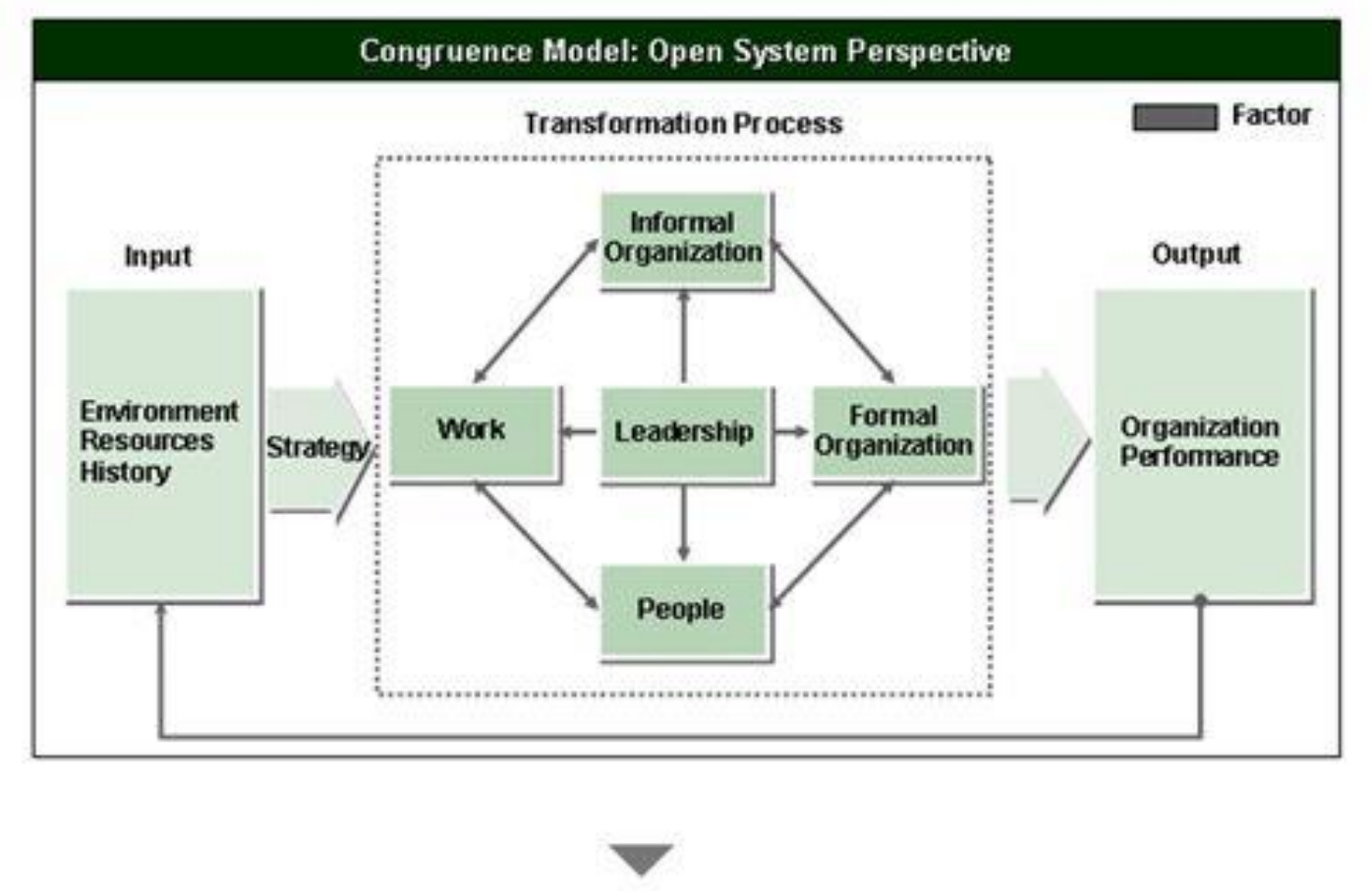

Figure 3.3: Nadler & Tushman's Congruence Model

Source: Stanford (2007)

3.2.2.3 Hackman and Oldham's Job Diagnostic Survey

Hackman and Oldham's (1974) job diagnostic survey is an instrument intended to measure: the objective characteristics of jobs, particularly the degree to which jobs are designed so that they enhance the internal work motivation and the job satisfaction of people; the personal affective reactions of individuals to their jobs and the broader work situation; the readiness of individuals to respond positively to 'enriched' jobs, like jobs that have a high potential for generating internal work motivation (Hackman & Oldham, 1974:1). Job characteristics (skill variety, task identity, task significance, autonomy, feedback), psychological states, and personal and work outcomes are fundamental elements of the model (Boonzaier, Ficker & Rust, 2001:12).

Buys, Olckers and Schaap(2007:33) and Hackman and Oldham (1974) identified five job characteristics and developed the Job Diagnostic survey to measure:

(i) Skill variety: the degree to which the job requires various activities.
(ii) Task identity: the degree to which the job requires the completion of a whole and identifiable piece of work-doing a job from beginning to end with a visible outcome.
(iii) Task significance: the degree to which the job substantially impacts peoples' lives and work.
(iv) Autonomy: the degree to which the job provides substantial freedom and discretion to the individual in scheduling the work and determining the procedures to be used in carrying it out.
(v) Feedback: the degree to which carrying out the work activities required for the job results in the individual obtaining direct and transparent information about the effectiveness of their performance.

The model was criticized for not addressing technical, interpersonal or situational moderators concerning how people react to their job (Boonzaier, Ficker & Rust, 2001:23).

3.2.2.4 Galbraith's Star Model

Galbraith developed the Star Model (Figure 3.4) in the late 1960s. It is a widely accepted model because of the approach that flawlessly links competitive advantage to strategy, structure, people, lateral processes and reward mechanisms (Stanford, 2007:22). According to Galbraith (2014: 57), the Star Model provides the foundation on which a company can base its organisational design. The model consists of a series of design policies controlled by management, which can influence employee behaviour. Policies refer to the tools with which management must become skilled to effectively shape their organisations' decisions and behaviours. Star Model design policies fall into five categories. First is strategy, which determines direction. The second is structure, which determines the location of decision-making power. The third is the process, which has to do with the flow of information; the process can be either horizontal or vertical. For example, business planning and budgeting processes are considered vertical, whereas horizontal processes are designed around the workflow. The fourth category is the rewards and reward system, which influences the motivation of people to perform and address organisational goals. Finally, the model's fifth category comprises people-related policies (human resource policies), which influence and frequently define employees' mind-sets and skills (Galbraith, 2014: 56).

Figure 3.4: Galibrath Star Model

Source: Galbraith (2014)

Strategy

Galbraith (2014:25) explained a strategy as the formula for a firm to operate successfully. The firm's strategy specifies the goals and objectives to be attained as well as the values and missions to be followed; it sets out the primary direction of the firm. In addition, a strategy defines what services or products are provided, the markets served, and the value offered to the customer. Finally, it specifies sources of competitive advantage, which are essential in the organisational design process since it establishes the criteria for selecting alternative organisational forms (Kates & Galbraith, 2007:5).

(a) Structure

The structure of an organisation determines the placement of power and authority in the organisation (Kates & Galbraith, 2007:8). Galbraith (2014: 33) and Kates & Galbraith (2007:8-16) further explained:

> *"Structure policies fall into four areas: specialization; shape; distribution of power; departmentalization. Specialization refers to the type and number of job specialities used in performing the work. Shape refers to the number of people constituting the departments at each level of the structure. Large numbers of people in each department create flat organisation structures with few levels. The distribution of power, in its vertical dimension, refers to the classic issues of centralization or decentralization. In its lateral dimension, it refers to the movement of power to the department dealing directly with the issues critical to its mission. Departmentalization is the basis for forming departments at each level of the structure. The standard dimensions on which departments are formed are functions, products, workflow processes, markets, customers, and geography. Matrix structures are ones where two or more dimensions report to the same leader at the same level."*

(b) Processes

Information and decision processes cut across the organisation's structure; if the structure is thought of as the organisation's anatomy, processes are its physiology or functioning. Management processes are both vertical and horizontal. These management processes are becoming the prime vehicle for managing in today's organisations. The lateral processes can be carried out in various ways, from voluntary contact between members to complex and formally supervised teams (Galbraith, 2014: 41; Kates & Galbraith, 2007:20-21).

(c) Rewards

A reward system aims to align the employee's and organisations' goals. It provides motivation and incentives for the completion of the strategic direction. The organisation's reward system defines policies regulating salaries, promotions, bonuses, profit sharing, stock options, and so forth. A great deal of change is taking place in this area, particularly as it supports the lateral processes. For example, firms are now implementing pay-for-skill salary practices and team bonuses or gain-sharing systems. There is also the growing practice of offering nonmonetary rewards such as recognition or challenging assignments. The Star Model suggests that the reward system must be congruent with the structure and processes to influence the strategic direction. Reward systems are effective only when they form a consistent package in combination with the other design choices (Galbraith, 2014: 46; Kates & Galbraith, 2007:21).

(d) People

The people category governs human resource policies regarding recruiting, selection, training and development and rotation. Human resource policies are appropriately arranged to produce the talent required by the firm's strategy and structure, generating the mind-sets and skills needed to implement the chosen track. Flexible people are required for flexible organisations. Cross-functional teams need collaborative generalists (Galbraith, 2014: 24; Kates & Galbraith, 2007:22).

According to Galbraith (2014:24), different strategies result in organisations applying the Star Model. There is no one-size-fits-all organisational design that all firms should subscribe to, regardless of their particular strategic needs. All designs have their own merit but do not work for all firms under all circumstances. The design or combination of designs, which should be chosen, is the one that best meets the criteria derived from the strategy. Another implication of the Star Model is the interweaving nature of the lines forming the star shape. For an organisation to be effective, all the policies must be aligned and interact harmoniously. Such an alignment of policies will communicate a clear, consistent message to the company's employees. Therefore, the Star Model consists of policies that leaders can control to affect employee behaviour. It indicates that managers can influence performance and culture, but only by designing policies that positively affect behaviour (Galbraith, 2014: 24; Kates & Galbraith, 2007:22).

One of the advantages of the Star Model is its ability to overcome the negativities of organisational structure, as all options have positives and negatives associated with them. Moreover, if management could identify the negatives of its preferred option early, the other policies around the Star Model can be designed to counteract the negatives while achieving the positives. Centralisation can be used as an example. When the internet became popular, many organisational units began initiatives to respond to it. These organisations experienced the positives of decentralisation. They achieved the speed of action and involvement of people closest to work and tailored the application to the unit's work. However, on the other side, they also experienced the negatives of decentralisation. The many initiatives duplicated efforts and fragmented company response due to multiple interfaces for customers and suppliers. As a result, companies struggled to attract talent and sometimes had to settle for less than top people (Galbraith, 2014: 24; Kates & Galbraith, 2007:22).

Most firms have responded by centralising the activities surrounding the internet into a single unit. They reduced duplication, achieved scale economies, and presented a single face to the customer. The result was that companies combined many small internet units into one large one, which seemed more applicable to professional internet

managers. But at the same time, decision-making has moved farther from work, and the central unit has become an internal monopoly, resulting in a lack of responsiveness to other organisational departments using the internet. To minimize the negatives of the central unit, company management can design the appropriate processes, rewards, and staffing policies. For example, in the planning process, the central unit can present its plan to service the rest of the organisation. The leadership team can debate the plan and arrive at an approved level of service. The plan can be prepared by people from the central unit and a horizontal team throughout the company (Galbraith, 2014: 24; Kates & Galbraith, 2007:22).

Along with its goals of reducing duplications and achieving scale, the central unit will also be expected to meet the planned service levels upon which were agreed. Subsequently, the central unit's performance will be measured and rewarded based on the planned goals. And finally, to keep the central unit connected to the work, it can be staffed by a mix of permanent professionals and rotating managers from the rest of the organisation on one or two-year assignments (Galbraith, 2014: 23; Kates & Galbraith, 2007:22).

Such a complete design increases the chances of the central unit achieving its positives while minimising the usual negatives. However, Stanford (2007:22) criticised the star model for not “calling out” some key elements, including an inputs/outputs culture. According to Stanford (2007:39), similar to the 7-S model, Galbraith’s Star Model does not mention the external environment and operating context. The different dimensions and the limitations of the four models are summarized in Table 3.1.

Table 3.1 Summarized dimensions and limitations of the four models

Organisational Design Model	Core dimensions/Elements	Critique/Limitations
The McKinsey 7-S Framework (1979)	Strategy, Structure, Systems, Shared values, Style, Staff, and Skills	Peh & Low, (2013) argued that the McKinsey 7S framework is too rigid and would be dysfunctional to handle the dynamic changes in a firm's competitive environment. Stanford (2007) also noted the absence of feedback loops and performance variables in the model
Nadler & Tushman's congruence model (1980)	Formal organisational arrangements, Informal organisation, Work (Task), and People (Individual components)	Stanford (2007) expressed his critique that the few named elements may lead to wheel-spinning or overlooking of crucial aspects
Hackman & Oldham's job diagnostic survey(1971)	Job characteristics (skill variety, task identity, task significance, autonomy, feedback), Psychological states, Personal and work outcomes	It doesn't address interpersonal or situational moderators of how people react to their work (Boonzaier, Ficker & Rust, 2001)
Galbraith's information processing or Star Model from the 1960s.	Strategy, Structure, People, Processes, and Rewards	Stanford (2007) criticised the Star Model for not incorporating some key elements, including inputs/outputs culture. He also underlined that Galbraith's Star Model does not explicitly mention the external environment and operating context.

3.3 Project-Based Organisations (PBOs)

Bureaucracies were assumed to provide a stable, efficient, and certain environment to conduct business. Managing change was limited to technical functions and specialists. But now, change is endemic, brought on by the exponential growth of communications and technology. As the world becomes more complex and increasingly interrelated, changes that were seemingly far away now affect us. A change could occur frequently or randomly. Therefore organisations must adopt flexible structures to respond to such a changing environment (Turner, 2009:3). Todorovic, Mitrovic and Bjelica (2013:41) also stated that the contemporary business environment is characterised by complexity, openness, and inconsistency followed by a high degree of instability. This turbulent environment is demanding a move towards organising in flexible and ad hoc manners that involve frequent adaptations to changes and opportunities. That requires developing an organisational form that is flexible enough to adapt to such an unstable environment enabling the development of management systems that provide operational and strategic excellence (Bakker, DeFillippi, Schwab & Sydow, 2016:1703).

A project form is a preferred methodology for a dynamic environment since it is perceived as a controllable way of avoiding all the classic problems of bureaucracy (Turner, 2009:2; Abrantes & Figueiredo, 2013:758; Kwak *et al.,* 2015:1652). In such an approach, projects, not departments, become the unit of control and the involvement of management is to manage the relationships between projects and their environment (Kwak *et al.,* 2015:1652). Turner (2009:2) explained a project as a temporary organisation assigned resources to do the work for beneficial change. Change and the need to manage change through projects influence the working and social environment (Turner, 2009:3). Recent studies showed that more firms adopt projects to achieve strategic and operational objectives (Miterev, Turner & Mancini , 2017:9; Lundin, Arvidsson, Brady, Ekstedt, Midler & Sydow , 2015:1).

Projects, particularly those involving multiple organisations, have become increasingly important due to shortening product lifecycles and an increasing need for flexible mobilization and coordination of dispersed resources and expertise (Soderlund, 2008:42). The expansion of projectification started in the 1930s, with a substantial boom

in its adoption in the 1960s. Recent estimates put the portion of project works at around one-third of the GDP in Western countries (Lundin *et al.,* 2015:80). Turner (2009:1) also stated that about one-third of the world economy is project-based. Moreover, projects are basic forms of organising and collaborating in many domains, such as software, film, events, research, construction, consulting complex products, and system development (Hobday, 2000:874).

Projects as temporary systems are likely to be embedded in more permanent contexts. Responding to the need for project management, many organisations have tried integrating projects into an existing functional organisation. Englund and Graham (2019:46) have expressed the drawback of such a simple integration of projects by using a matrix approach in which the functional managers control departments such as engineering, marketing, and others, and project managers coordinate the work across functions. The primary failure was a marginal change, a simple adjustment to the old hierarchical organisation. Many upper managers' assumptions were based on the functional organisation or mechanistic model. Project members felt that rewards favoured departmental work and that working on projects was detrimental to their careers. Project members were treated as second-class citizens. A matrix approach also represents a marginal change without resolving the typical problems of bureaucracy. In a matrix organisation, employees complained of being caught in a web of conflicting orders, priorities, and reward systems that do not fit organisational goals (Englund & Graham, 2019:46-49).

Englund & Graham (2019:50) further explained that the drawback of bureaucracy caused the tenets of an organic organisation. An organic organisation is one in which everyone takes responsibility for the success of the whole. The basic concept of regulating relations among people by separating them into specific predefined functions is abandoned. The challenge is to create a system where people enter into relations determined by problems. The tenets of such organisations are described in post-bureaucratic organisations, where a team forms the basic building block. In the post-bureaucratic organisation, consensus on action is reached by influence - the ability to persuade rather than command, not by positional power. Each person in the team

comprehends how his performance affects the overall strategy. Highly effective people in such organisations can influence without authority by using reciprocity as the basis for influence. Also, communications need to be explicit and open (Englund & Graham, 2019:50).

Organisations that attempt to change their environment to support projects report difficulty with the process since organisations by themselves are not project organizations. Creating an environment for projects within the existing alien organisation can be very difficult (Englund & Graham, 2019:80). The need for a new form of organisation emerges, a Project-based organisation.

A Project-based organisation (PBO) is a unique organisational form where business activities are implemented and managed around temporary projects (Winch *et al*., 2022:146; Choi *et al.*, 2018:2; Sydow *et al*., 2004:1475; Thiry & Deguire, 2007:649). A PBO must meet dynamic customer demands and carry out multifaceted, unique tasks (Nightingale, Baden-Fuller & Hopkins, 2011:216).

A Project-based organisation (PBO) could be a subsidiary of a larger firm, servicing internal or external customers or could stand alone servicing external customers. It could also be a consortium of firms that collaborate to service third parties (Gann & Salter, 2000:958; Hobday, 2000:875; Sydow *et al*., 2004:1476; Koskinen & Pihlanto, 2008:8). Project-oriented firms are also classified as Type 1, Type 2, and Type 3 firms (Lundin *et al.*, 2015:142). Type 1 firms are those that deliver projects to external customers. Type 2 firms supply to other business units within the same parent organisation, essentially being a back-office (Miterev, Turner & Mancini, 2017a:480). The Type 3 organisations are project-led front offices. Some project-supported organisations heavily rely on projects, such as; IT projects, new product development, and research and development, and essentially represents project-dependent front offices. Hobday (2000:872) refers to these as project-led organisations and distinguishes them from PBOs, which organise most of their internal and external activities in projects (Turner & Miterev, 2019:487).

PBOs are commended for their capacity to address dynamic customer needs flexibly, bypass barriers to organisational change, integrate diverse knowledge sets and innovation, and deliver complex non-routine tasks (Miterev, Turner & Mancini , 2017:9; Sydow *et al.*, 2004:1475; Nightingale *et al*., 2011:5; Hobday, 2000:871). PBOs create temporary systems and arrangements through which organisations provide services to their clients, developing customised projects. It includes film productions, construction, and consultancies (Prado & Sapsed, 2016:1795). Interest in PBOs has grown in recent decades (Sydow *et al.*, 2004:1475; Prado & Sapsed, 2016:1795). Knowledge, capabilities, resources, and structures are mainly built through the coordination and execution of projects (Hobday, 2000:874; Miterev, Turner & Mancini, 2017a:482).

PBOs can simultaneously incorporate multiple projects as permanent structures (Miterev, Turner & Mancini, 2017a:481; Oussama, Othmane & Zitouni, 2013:47). Moreover, Miterev, Turner & Mancini (2017a:482) defined PBOs as organisations making strategic decisions to adopt a project program. They explained project portfolio management as business processes to manage PBOs' work and which view themselves as project-oriented. Miterev, Turner & Mancini (2017a:482) also explained projects and programs as temporary organisations to which resources are assigned to do work to deliver beneficial change. A program is a collection of projects managed together to deliver strategic change objectives that one project could not perform independently. Furthermore, a project portfolio is a permanent organisational setup, with a collection of projects or programs sharing common resources (Winch *et al*., 2022:146).

The success of PBOs highly depends on decentralised teamwork and the actions of autonomous project managers. But also, coordination within and across organisations is often critical for ensuring, for instance, that knowledge gained in a particular project is stored for use in other projects or those project routines are improved over time. A related, recurring tension within PBOs appears to be between the immediate demands for the performance of the project at hand versus the opportunities for learning and disseminating project practices that can be employed in subsequent projects. Some

argue that project activities' on-off and non-recurring nature provides little hope for routinised learning (Hobday, 2000:871) or systematic repetition (Gann & Salter, 2000:957). Sydow *et al.* (2004:1476)) argued that 'economies of repetition' can be obtained by learning to improve the efficiency and effectiveness with which a growing volume of bids are submitted and projects executed. Dealing with these dilemmas necessitates challenging the fundamental assumptions in normative project management theory.

PBOS are available in a wide range of industries. These include consulting and professional services including architectural design, advertising, accounting, law, public relations, management consulting, cultural industries (fashion, video games, publishing, film-making); high technology; complex systems and products including construction, telecommunications, transportation, and infrastructure (Sydow, Lindkvist & Defillippi, 2002:1475; Gerdin, Bjorkander, Henriksson, Nilsby & Singer, 2010:3).

Construction firms like other PBOs tend to focus on developing client-oriented products and systems. As a result, they will continually build capabilities through involvement with the product. It means that the learning that accrues when a firm moves into a new market can be understood as a dynamic process of building capability over time. Therefore, such organisations must develop their capabilities to respond to dynamic environments and capabilities (Dainty & Chan, 2011:78).

3.3.1 Characteristics of Project-based organisations (PBOs)

Organisations striving to create a favourable environment for projects face problems. The first problem is the urge to get the job done, ignoring the required organisational environment containing projects. Many organisations have tried to start the transformation process into PBOs by immediately sending their project managers out for training. This led to frustration as the trained managers returned to find that they could not practice their skills in the current organisational environment (Englund & Graham, 2019:81).

The second problem is that the non-repetitive project environment would now be strange to long-standing organisational members. A thriving environment for projects

incorporates the whole organisation, not just the structures created for project management. Focusing on the change to PBOs means everyone in the organisation needs to be trained and tuned to support projects fully. The third problem is organisations might not have installed all the components required, so the resulting environment is not as supportive as it should be. All the components need to be in place for a complete environment, as each affects the other (Englund & Graham, 2019:83).

Englund & Graham (2019:83-89) listed the components or characteristics of a PBO for a successful project environment:

(a) The upper management teams should give strategic emphasis to projects. Also, projects should be selected for their strategic values. The upper management team should reinforce the idea that the participation of the whole organisation is essential to create project success. There should be a change in some behaviour of the upper managers themselves. Top managers who previously thought project management was not part of them and their behaviour had little to do with project failure need to correct their opinions.

(b) The other characteristic of a successful project environment is the support of the all-important project core team, particularly those that endeavour to produce a systemic solution. The concept of a core team is to have a team representing the most significant departments that will stick with the project from the beginning to the end. The success of this component is dependent on the previously discussed component. Unless organisational members are fully behind the project team idea and receive training on project management, they may find it challenging to work as members of project teams. Cross-departmental teams are needed for successful projects.

(c) Project stakeholders demand a diverse set of progress reports. The organisational members also need to know the status of their projects to provide full support. The project management information system informs members of the organisation on progress, the upper management team on how their selected projects are doing, and

project team members of progress and problems. A project information system helps hold a PBO together.

(d) Project manager selection and development are paramount in a PBO because only a competent project manager can fulfil the project's mission. However, the current development of a project manager is different from when project management first began. Project managers are now expected to master business, behavioural, and organisational skills with technical skills.

(e) Adaptive and generative learning would help a PBO to build on its strengths, streamline its processes, and innovate new ways to be competitive. A cycle of knowledge creation enables a PBO to put theories, ideas, and best practices into methods and tools. The evolved practical knowledge and results are recycled into modified theories and practices.

(f) An intensive effort need to exist to drive the continuous improvement of project management across the PBO A project office would help to create a successful environment and guides the organisational change essential to sustain the environment. Englund & Graham (2019:83-89) further discussed project offices as follows:

> *"A project or program management office is the best vehicle to lead and implement organisational change following from the premise that: projects create the means to generate profits and shareholder value; projects change how organisations work; each project manager becomes a change agent; effective change agents focus on human factors and follow proven processes; theory, best practices, and case studies support these factors, and these elements require a driving force to make them happen. With a project office, the other components now have a visible head and body that guide all efforts to optimize project success."*

Gareis & Huemann (2007:183) also explained PBO characteristics:

> *"Management by projects is considered as an explicit organisational strategy; Projects and programs are applied as temporary organisations; Networks of projects, chains of projects, and project portfolios are management objects of consideration; Project management, program management, and project portfolio management are explicit processes; Know-how, assurance, and assignment of people to projects is organized by expert pools; Project management quality is assured by a PM office; Strategic alignment of the project portfolio is performed by a project portfolio group; A "New management paradigm" is applied; Self-perception as being project-oriented."*

Different dominant project success factors were matched with Executive Project Management Knowledge (EPMK) and Project Management Coal-face Knowledge (PMCK)(Rwelamila & Ssegawa, 2014:215). Rwelamila & Purushottam (2012:9) incorporated change to PBOs and other characteristics of PBOs as one of the critical areas to be addressed under EPMK. It includes a transformation into full-fledged PBOs; strategic emphasis on the project, program, and portfolio; developing a core team process; developing organisational project management; organising for project management; understanding the influence of upper managers; developing a learning organisation; planning for project manager selection; and developing a project management information system (Rwelamila & Purushottam, 2012:9).

3.3.2 Current Status of Ethiopian Construction Firms as PBOs

The Ethiopian construction industry (ECI) contributes a significant share to the growth of the national economy. The ECI has continuously scored double-digit growth in the last consecutive years. But project delay and cost overrun were identified as significant causes for concern in the ECI according to a Construction Sector Transparency (COST) Initiative-Ethiopia aggregate study done on 52 construction projects (COST-Ethiopia, 2016:X).

Ayalew, Dakhli and Lafhaj (2016:1) also underlined that the ECI is faced with many shortcomings. Project overruns, poor quality of work, inappropriate procurement systems, a failure to cope with project requirements, and the inability to adopt competitiveness were among the reasons identified by them. In addition, the same study explained that schedule slippage of projects in Ethiopia ranges between 61% and 80%. Moreover, planned costs and other variables such as risk, quality, resource utilisation, and safety deviate from 21% to 40% from the predetermined requirements at the beginning of the projects (Ayalew, Dakhli and Lafhaj, 2016:1).

Most ECFs have failed to deliver government and private projects within the scheduled time and projected cost due to capacity-related problems (ECPMI, 2017:1-2). A baseline survey study on the construction sector of Ethiopia on behalf of the Ethiopian Construction Contractors Association identified the main contractor-related constraints affecting the timely completion of projects: poor project and contract management by the contractor, delay in supply of materials and equipment, and shortage of adequate finance to run the project (Habcon Consult, 2011:86). This study also identified factors that affect the quality of project work as: the absence of skilled labour and competent professionals; the use of inferior quality equipment and products; the poor quality assessment system in an organisation; the shortage of proper training; the low level of management commitment; the attitude of professionals, and management effort to meet quality standards not to increase the cost of production but productivity (Habcon Consult, 2011:86). Another study by the Ethiopian Construction Project Management Institute (ECPMI) has mentioned poor coordination of work and wastage of construction materials among the top ten identified capacity problems of Ethiopian contractors (ECPMI, 2017:65-67).

A business failure can impose a substantial negative impact on numerous stakeholders and a concern to owners, policymakers, industrialists, investors, managers, and governments. Due to business failure, lives can be ruined, jobs lost, communities destroyed, and time and money wasted. The national economy would also be affected ultimately. Business failure refers to the inability of a business to operate, most often as a result of financial detriment (Holt, 2013:50). According to Holt (2013:50-51), business

failure has been described in numerous ways throughout the literature including corporate failure; insolvency; bankruptcy; shortage of money; termination of operation; default; and cessation of business activity.

Business failure holds more significance for the construction industry. Studies showed that the average failure age of construction companies is decreasing (Holt, 2013:58). Besides, affected employees, suppliers, and creditors, and contractor failure would negatively impact a construction project through delay and cost overruns (Holt, 2013:54). According to Wong, Ng & Kong (2010:4) construction firms are susceptible to bankruptcy due to the fragmented nature of the industry, high risk and uncertainty involved, high competition, and extensive fluctuations in the construction volume.

Construction firms with a track record of successful single-project completion were previously considered successful construction organisations. However, the success of a particular construction project does not necessarily make a construction organisation successful as a whole. Therefore, the success of construction organisations should be measured at the organisational level rather than focusing only on the project level (Tripathi & Jha, 2019:222). Holt (2013:50) stated that generic agents for construction business failure include financial, managerial, company characteristics, and macroeconomics.

Another study focused on factors causing bankruptcy among civil engineering construction firms in South Africa identified operational management and strategic management issues contributing to high organisational failure (Rwelamila & Lobelo, 2011:2). Kivrak and Arslan (2008:297) also found poor management practice among the most critical factors negatively affecting the construction business and causing failure. In Mozambique, only 5% of local contractors are in a position to bid for construction projects requiring sizable finance. Besides external factors, an internal capacity problem of the local contractors has hindered the growth of the local contractors. The absence of local competencies is identified as one of the top reasons for the failure of local players in the value chain of the construction industry of Mozambique (Nhabinde, Marrengula & Ubisse, 2012:15).

The ten-year strategic plan (2020-2029) by the Federal Democratic Republic of Ethiopia (FDRE), Ministry of Urban Development and Construction (MoUDC) also viewed the cause of the problem from a broader perspective; the absence of a “Corporate level thinking” at the local contractors. The same study also depicted that local Ethiopian contractors have been limited to small-sized projects due to the previously mentioned constraints. International construction firms are mainly executing mega construction projects in Ethiopia (MoUDC, 2020:60). Furthermore, Ethiopia is in the process of joining the World Trade Organisation (WTO), which would enforce opening its doors to more international contractors, intensifying competition. In summary, local ECFs are currently working in a turbulent, dynamic, open, inconsistent, and complex business environment with changing customer demands.

Suppose local contractors transform themselves and become competitive, becoming full-fledged PBOs. In that case, a considerable amount of foreign currency flowing to international contractors could be saved (MoUDC, 2020:60). The question is how local contractors could transform themselves to be competitive enough. A focused effort on organisational design components, including organisational capabilities, systems, and processes, paves the road for the transformation of organisations (Abu Bakar *et al*., 2012:1302; Bhattacharya, Momaya & Iyer, 2013:45).

Ethiopian construction firms (ECFs) could not significantly improve their present-day static bureaucratic arrangements. Stanford (2007:1) insisted that the risk of organisational failure in different aspects could be minimized or even entirely avoided by consciously designing a new organisation or redesigning an existing one to perform well and adapt readily to changing circumstances. It implies assessing all elements of an organisation and its operating environment and aligning them with each other (Stanford, 2007:1). Ethiopian local construction firms need to redesign their organisational form transforming them into full-fledged PBOs, which are flexible organisations responding to dynamic environments (Turner, 2009:3).

3.3.3 PBO Organisational Design

The organisational design of PBOs, where a large number of operations are organised as simultaneous or successive projects, is often complex and challenging (Hobday, 2000; Sydow *et al*., 2004; Jerbrant, 2014:33). PBOs are characterised by unique features, which result in specific organisational and managerial issues. Moreover, PBOs are characterised by a high level of decentralisation and autonomous teams. The unique nature of project business firms is the fluid, temporary nature of their organisational structures and dynamic business networks (Hobday, 2000).

Due to the above-mentioned unique nature of PBOs, managing such organisations differs significantly from managing a traditional bureaucratic organisation (Gerdin *et al*., 2010:1-2; Lindkvist, 2004:19). Bocean (2018:265) has stated processes, methods, and tools as the enablers of project management to execute projects. But the traditional approach seems to be too focused only on the projects. PBOs are inherently faced with the conflicting temporary nature of projects and the more permanent organisational setting that defends long-term development and intra-organisational coordination (Melkonian & Picq, 2011:455). Thiry (2008:1) underlined how to respond to these conflicting needs:

> *"PBOs conduct the majority of their activities as projects and/or prefer project over functional approaches. They are fast emerging as a serious trend, but many organisations still do not understand how to structure themselves to effectively create a strategic advantage from projects. PBOs need to be structured to create synergy between strategy, project, program and portfolio management, and the project approach needs to both generate tangible value for the stakeholders and be sustainable."*

Chinowsky (2011:3) mentioned that since the organisational turn in project management research, there had been an evident emerging trend towards treating project management as a holistic organisational phenomenon. PBOs need a structure to create synergy between organisational strategy, projects, operations, and processes (Bocean , 2018:272).

Miterev, Turner & Mancini (2017b: 528) stressed that works of literature on PBOs are too focused on projects and different aspects of management. They expressed their concern about the gap in the literature on this area, and the absence of holistic models of PBOs. Soderlund, Hobbs and Ahola (2014:1089) suggested cross-fertilization between organisational theory and project management to develop PBO models. An established research area within the organisational theory that directly addresses similar issues could help take a holistic look at PBOs in organisational design (Van De Ven, Ganco & Hinnings, 2013:398; Miterev, Turner & Mancini, 2017b:528).

PBOs exist in all industries. It is a widespread organisational form associated with distinct characteristics and contingencies. Furthermore, PBOs use the management of temporary organisations in the form of projects and programs. When a project or program starts or finishes, there is a redefinition of task division, task allocation, reward provision, and information provision within the organisation. A PBO is a new form of organisation with a continuous churn in the different components of organisational design (Huemann, Keegan & Turner, 2007:320).

The evolving importance of project-related forms of organisation calls for a profound understanding of their management under various organisational preconditions (Turner & Miterev, 2019:487). Moreover, the organisational design perspective is gaining momentum in studies on project-based management across multiple organisational levels (Aubry & Lavoie-Tremblay, 2018:12; Miterev, Turner & Mancini, 2017a:481). It has built upon extensive knowledge developed in organisational theory and design over the past 70 years (Van De Ven, Ganco & Hinnings, 2013) and adapts to the context of PBOs by taking into account the distinct nature of project work (Turner & Miterev, 2019:487).

Extant literature highlights the increasing inability of firms working with projects, to meet infrastructure clients' expectations particularly as it concerns the delivery of socio-economic outcomes during the delivery process with observed cases of faulty and ineffective organisational architecture, functional and communication issues. The

Nigerian government sits among the league of unsatisfied clients. The disappointment stems from the inability of those firms responsible for delivering economic infrastructure to accomplish the policy goals of the government (Awuzie & Mcdermott, 2015:269).

Organisational design focuses on different organisational forms, design strategies available to managers, and internal and external contingencies. It has been well discussed in the context of more traditional organisations since the middle of the past century. However, understanding the complementary design choices available to managers of PBOs is limited (Miterev, Turner & Mancini, 2017a:479). It demonstrates that PBOs require a different organisational design from the traditional organisation (Miterev, Turner & Mancini, 2017a:481).

Developing the organisational design perspective for projects and PBOs is by no means a straightforward endeavour (Turner & Miterev, 2019:487-488). Due to the great diversity of organisational forms and approaches at the project level, such as programs, portfolios, project networks, and organisations, the projects and organisations they belong to face different levels of complexity and uncertainty. Organisations might not introduce the management approaches and structures that suit their project tasks in the best way. Furthermore, the concept of history plays an important role in the project management literature.

Therefore, it is vital to identify interrelated patterns of organisational design dimensions or, in other words, organisational design configurations and various conditions under which they exist to pave the way for causal explanations in the future (Turner & Miterev, 2019:488). Jerbrant (2014:33) also defined PBO organisational design, where a large number of operations are organised as simultaneous or successive projects, as often complex and challenging to manage (Hobday, 2000; Sydow *et al.*, 2004).

Project management scholars have addressed various aspects of PBO organisational design (Hobday, 2000; Lindkvist, 2004). Turner & Miterev (2019:488) claimed that PBO organisational design received explicit multi-level attention, including projects, multiple

projects (Aubry & Lavoie-Tremblay, 2018:12), and Project-based organisations (PBO) as a whole (Miterev, Turner & Mancini, 2017a).

Although PBOs have been recognised in the literature for more than 25 years (Hobday, 2000; Lindkvist, 2004), surprisingly, there has been no holistic, definite model developed (Miterev, Turner & Mancini, 2017a:479). Instead, the main focus of previous studies was on supporting structures (project management offices), processes (learning and knowledge management), and human resources (individual competence) (Miterev, Turner & Mancini, 2017b:529).

The best way to understand organisations is to look at the dimensions describing specific organisational design traits. Dimensions describe organisations in the same way physical traits and personalities describe people (Daft, 2020:18). An organisational design addresses the antecedents, interactions, and consequences of various facets of an organisation, sometimes referred to as organisational design elements or dimensions. An implicit assumption within the scholarly stream is that such elements can be steered by management, at least partially, to achieve specific outcomes (Turner & Miterev, 2019:488). Daft (2020:23) described the entire purpose of understanding varying dimensions of organisations as follows:

> *"…to design the organisation in such a way as to achieve high performance and effectiveness. Efficiency refers to the amount of resources (materials, money, employees) used to achieve the organisation's goals. Effectiveness means the degree to which an organisation achieves its goals. These dimensions provide a basis for the measurement and analysis of characteristics that cannot be easily seen by the casual observer."*

3.3.4 The need for the transformation of Ethiopian Construction Firms into Full-fledged PBOs

Howard and Ruef (2006:157) explained the significance of transformation for organisations working in an evolving business environment:

> *"… First, an organisation that cannot change in fundamental ways will constantly be at risk, if its environment is evolving and it cannot keep pace. Second, if most organisations in a population are constrained from undergoing significant transformation, then that population will persist in evolving environments only through the founding of new organisations that are better suited to the changing context. If, however, some organisations are transformed and survive, their routines and competencies represent variations that have been selected and retained. If the new routines and competencies spread through imitation, borrowing, or other forms of diffusion, other organisations in the population that adopt them will also survive. "*

A transformation is a change, but not all changes are transformations (Howard & Ruef, 2006:133). Organisations should be able to adapt to changing settings, boost their competitiveness, and be ready for the future by effecting change (Kotter, 2010:3). Transformation embraces a significant change in an organisation over time. It represents a substantial planned or unplanned variation that has been selected and retained. Variations may arise through incentives offered to members, institutionalised experimentation, organisational tolerance of unplanned variation, and many other reasons. The selecting forces may be internal (e.g. managers and members) or external (e.g. government regulations and market forces). The designated variations represent a cut-off in organisational life and a discontinuity from the normal reproduction of organisational competencies and routines (Howard & Ruef, 2006:157).

Transformations in boundaries, goals, and activities occur against the context of daily routines and competencies to perpetuate organisational forms that are more or less untouched. Studies show that people could probably measure the pace of change for

most transformations in months and years, not days or weeks. But, a lengthy transformation process may put an organisation's resources at risk, while organisations with slack resources may not endure the process (Howard & Ruef, 2006:157). Englund & Graham (2019:77) explained transformation as a crucial shift in an organisation's identity and capabilities to deliver valuable results relevant to its purpose not mastered before.

Construction firms must adapt to different factors and enforce new processes to manage projects. PBOs are flexible and capable of adapting their processes and structures to evolving contexts. Abrantes & Figueiredo (2013:757) contributed a holistic methodology that provides a systematic approach to help an organisation transform. Their methodology proposed combining both aspects of change, including the hard (processes, procedures, and information systems) and the soft (employee motivation, leadership, and communication) factors for the organisation to transform into a future PBO organisation. However, understanding and effecting change in construction firms are made difficult by the dynamic and complex nature of the project environment and its effect on management and organisational processes (Bresnen, Goussevskaia & Swan, 2005:27; Hobday, 2000:878).

Englund & Graham (2019:77) explained the transformation toward PBOs as

> *"Any type or size of an enterprise may partake in a transformation, such as a shift toward a more project-based organisation guided by project offices, as long as a cultural shift is possible and highly engaged leaders are present."*

The question is how this transformation could materialise. Implementing change and growth strategies at PBOs is usually entrusted to individual manager skills. Still, it is strangely neglected in the organisational dimension (Englund & Graham, 2019:27). This study aims to develop a model transforming ECFs bound by different performance problems into full-fledged PBOs. Their organisational design will be discussed in detail in the following sections.

3.3.5 Redesigning Construction Firms

The fundamental units of the construction industry include mainly the construction firms involved (Tripathi & Jha, 2019:222). To realise the development of the construction industry, construction firms need to grow sustainably and become tangible competitors in a fierce market. The construction market has dynamically changed in size and structure in recent decades, especially in emerging markets. Moreover, the construction industry has a substantial role in developing countries. The management paradigm change of different construction firms has significantly contributed to the enhancement of the efficiency and effectiveness of their projects (Qi & Chen, 2014:321). A study presented at the World Economic Forum on “Shaping the future of construction” in 2016 recommended construction firms transform themselves into high-performance organisations and transform the construction industry (World Economic Forum, 2016:11). The question that needs an answer is how to redesign construction firms into “high-performance organisations”. Organisational transformation is accomplished by improving the organisation's strategy, work processes, and structure.

In PBOs, project management is a strategic competency, and improving performance in this dominion is of great significance (Kwak, *et al*., 2015:1652). The assurance of personnel, quality, and processes is a major concern of project-oriented firms. The high number of projects performed at the same time, the high complexity of the firm, the dynamics in the project portfolio, and the relative autonomy of projects and programs need definite integrative measures(Gareis & Huemann, 2007:206). Firms with growth ambitions, including local construction firms, should not only rely on the external competitive strategy and should rationally evaluate their overall internal capabilities, making strategic choices to enable the company to grow.

Study findings depicted that company systems and processes, customer orientation or value enhancement, future businesses, visionary leadership and intent, and a versatile workforce must be optimally synergised for growth. Therefore, firms must rethink their organisational design to stay alive and become competitive (Bhattacharya, Momaya & Iyer, 2013:45).

Rwelamila & Ssegawa (2014:215) identified different project success factors (PSFs). These success factors brought the need for strengthening the bridge from the project management coal-face knowledge (PMCK) side and the executive project management knowledge side (EPMK), as depicted in Figure 3.5. Project success combines PMCK and EPMK (Rwelamila & Ssegawa, 2014:217). This study mainly focuses on transforming the executive or organisation side for the success of projects.

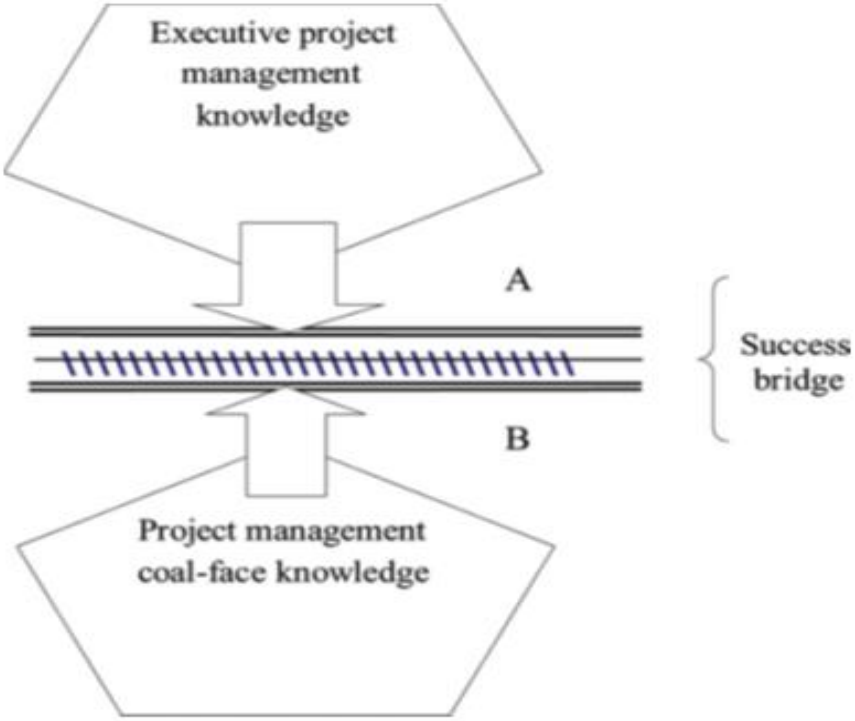

Figure 3.5: Project Success Bridge

Source: Rwelamila (2008)

3.3.6 PBOs and Maturity Models

Organisations could improve themselves by working on their strategy, structure, and processes. Practices related to this domain cover a wide range of activities. Maturity models are strategic tools that help comprehend these practices to develop a systematic approach for successful, long-lasting changes (Sadatsafavi & Walweski, 2011:6). Furthermore, maturity models have become famous for analysing and developing individual and organisational competencies. Maturities can be measured

and analysed for individuals, permanent and temporary organisations, social systems, teams, and even societies (Gareis & Huemann, 2007:183). Maturity models have been considered strategic tools for senior managers to identify improvement areas and prioritise improvement actions (Kwak *et al*., 2015:1653).

Studies indicated that firms with higher project management maturity levels are expected to be successful in their project efficiency and effectiveness and consequently have a competitive advantage in the market (Backlund, Chroneer & Sundqvist, 2014:837). Kwak *et al*. (2015:1652) also mentioned how a systematic approach to project management maturity models through identifying and implementing project management practices and processes could increase the effectiveness and comprehensiveness of general management practices. Some excellence and maturity models have been extended further to address change management requirements in project-driven contexts specifically. To improve the effectiveness of organisational efforts, PBO managers defined multiple managerial levels providing a capacity for prioritising projects and aligning them with organisational strategies (PMI, 2003).

PMI standards have made a significant contribution to the project management profession worldwide. There are different types of organisational project management maturity models. After reviewing twenty-seven of the-then available maturity models, PMI published organisational project management maturity models (OPM3) in 2003. organisational project management maturity indicates the firm's capability to exploit projects in support of its strategic goals (Sadatsafavi & Walweski, 2011:2).

Two models are discussed among the different project management maturity models due to their attention to organisational design parameters. First, the PBO maturation model discussed by Jerbrant (2014) will receive focus. Jerbrant (2014:33) expressed his concern that the classical view of multi-project management did not capture PBOs' dynamic nature. He further explained that the current theory falls short in its ability to explain how the management of these PBOs evolves because of their need to be agile and adaptable in a changing environment. Therefore, the balance between structuring mechanisms and the ability to handle the prevailing uncertainty in PBOs needs to be understood. This balance is necessary to manage the volume of changing requirements

-both operational and contextual-during a specific period, enhancing the organisation's dynamic capability.

This maturation model has provided an understanding of how the management of PBOs evolves because of their unique nature to be agile and adaptable in a changing environment (Figure 3.6). It causes the focus of their project, program, and portfolio management to transfer between structuring administration and managing any uncertainty, which increases their multi-project management maturity. After developing the maturity model, a study was recommended on the link between project portfolios and the overall business strategy and the visualisation of business development from both structuring and uncertainty management. The model also underlines the need for optimal design at an organisational level (Jerbrant, 2014:48).

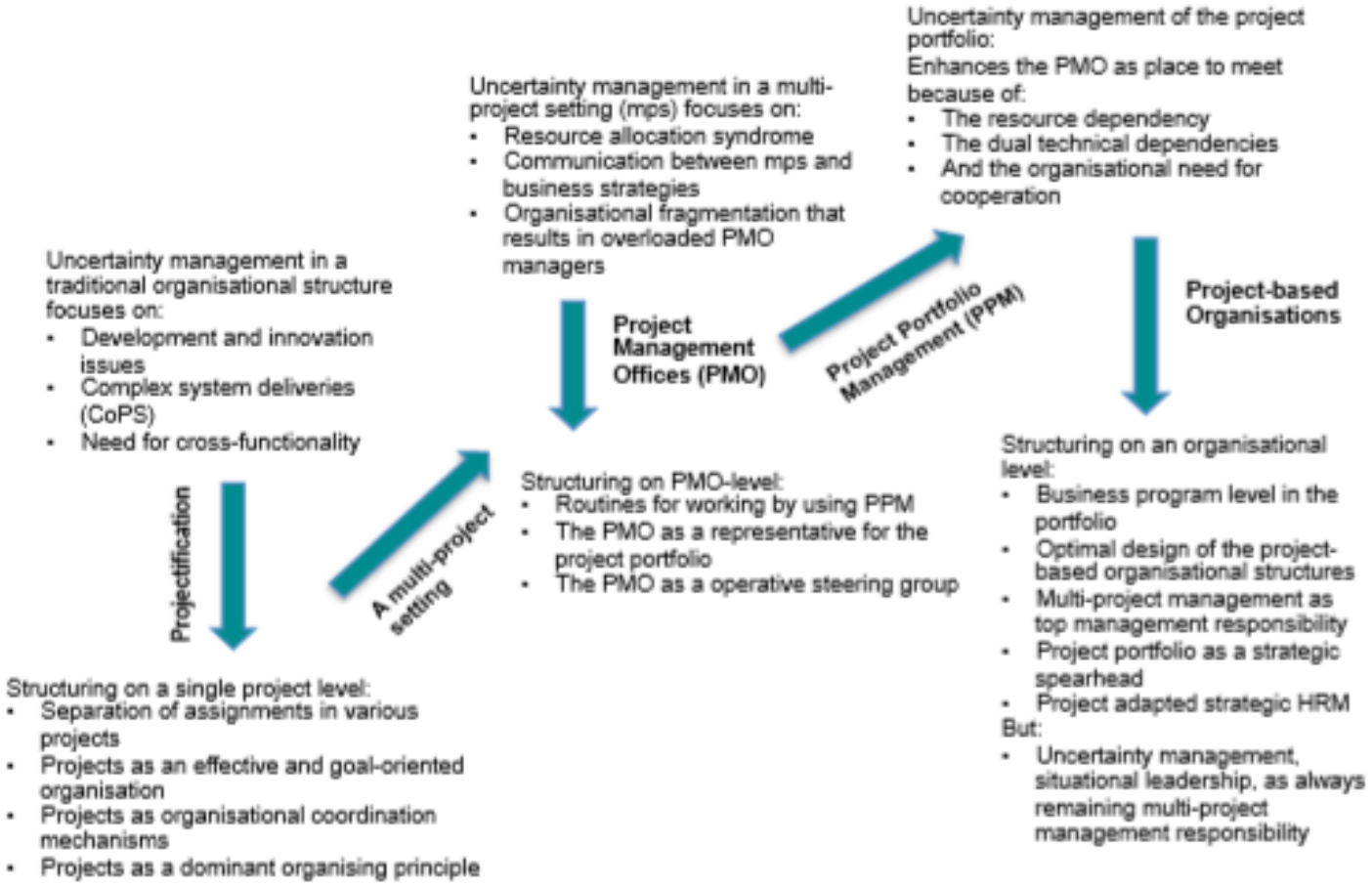

Figure 3.6: A maturation model of PBO

Source: Jerbrant (2014)

Another maturity model for project-oriented firms, the “Project-oriented company mature model” (Figure 3.7) developed by Gareis & Huemann (2007:202), includes dimensions of project and program management; assurance of the management quality of a project or a program, assignment of a project or a program; project portfolio coordination and networking between projects; personnel management and process management, and organisational design. This maturity model underlines the value of an organisational design dimension in building a mature project-oriented company besides the seven other pillars portrayed on the model.

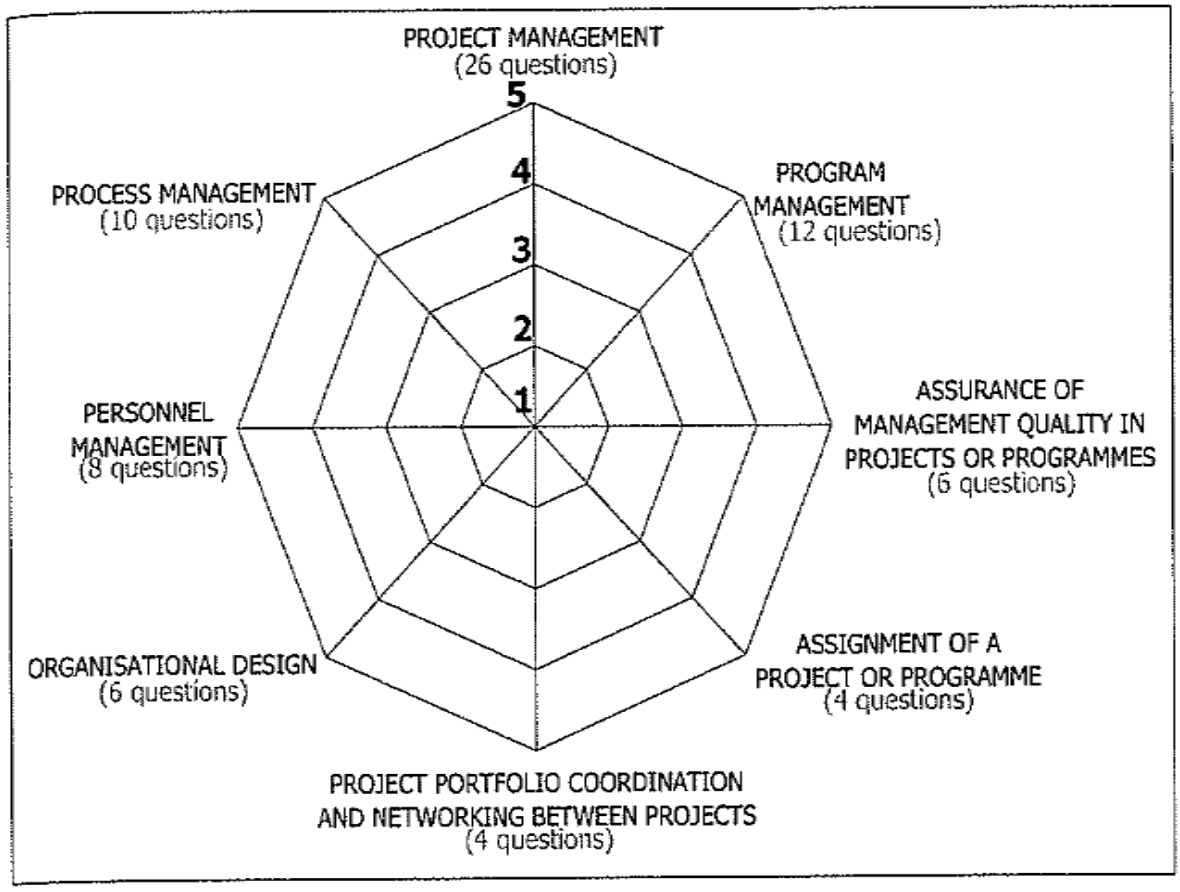

Figure 3.7: Project-oriented company mature model

Source: Gareis & Huemann (2007)

3.4 Theoretical Foundation of the Study (Modified Star Model)

The project management literature has covered the different elements of the Galbraith Star Model to a lesser or greater extent. However, no study deliberated on the holistic design of PBOs before Miterev, Turner & Mancini (2017). Miterev, Turner & Mancini (2017a:479) have adopted and modified the Star Model (2014) since projects can be viewed as systems for processing information. To incorporate elements of Nadler & Tushman's (1999) and Waterman & Peters' (2015) models, Miterev, Turner & Mancini (2017a:479) chose the five nodes starting from the top and going clockwise as strategy, process, behaviour, human resource, and structure. Miterev, Turner & Mancini (2017a:479) also identified the design choices available for the PBO. They reviewed the PBO literature to discover antecedents that influence the design of the PBO in comparison with traditional organisations.

Van De Ven, Ganco & Hinnings (2013:12), Aubry and Lavoie-Tremblay (2018:12), and Miterev, Turner & Mancini (2017a:489)agreed that the contingency theory is the governing theoretical construct for the design of PBOs. Van De Ven, Ganco & Hinnings (2013:420) stated that there had been a re-emergence of interest in the contingency theory of organisation design, indicating that the performance of an organisational unit is a result of the alignment between its internal arrangements and external context. Miterev, Turner & Mancini (2017a:489) disclosed that in a PBO, there must also be a fit to the need or choice to adopt project-based ways of working. Internal arrangements must reflect the strategic decision to be project-oriented and the resulting churn. In addition, there must be a fit between the adopted project-based ways of working and the functional hierarchy. Integrating contingency theory into other theories, such as the creative design perspective and the complexity theory reveals a high potential for understanding the complexity found in organisations (Van De Ven, Ganco & Hinnings, 2013:420).

The Modified Star Model, Figure 3.8, consists of five elements as the nodes of a pentagon, “alignment” at the centre of the star stresses that the five elements must be aligned with each other and with organisational strategy.

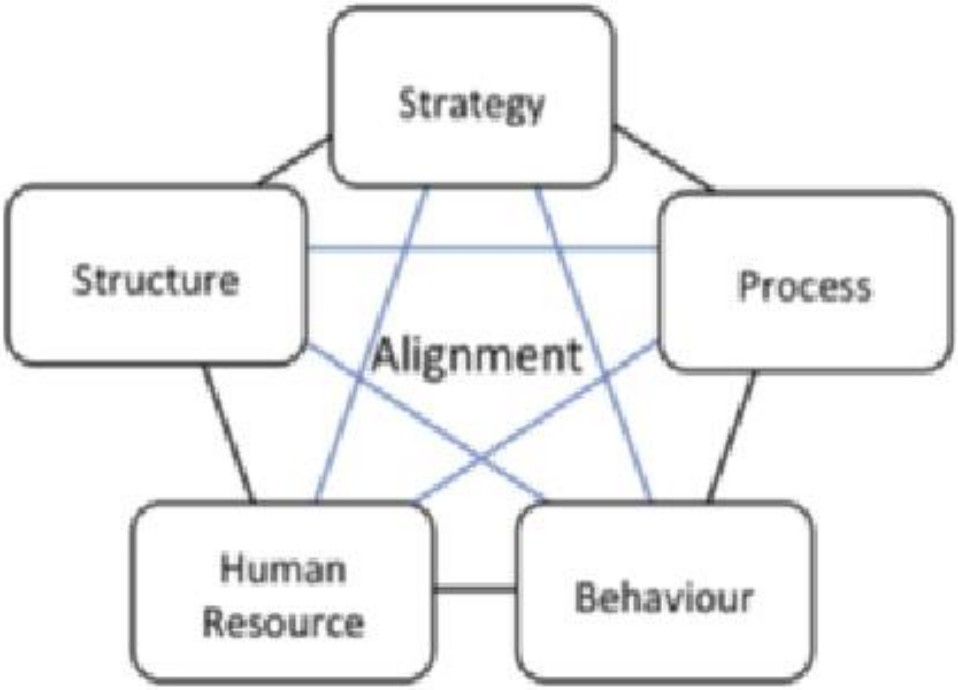

Figure 3.8: Modified Star Model

Source: Galbraith (2014) and Miterev, Turner & Mancini (2017a)

Miterev, Turner & Mancini (2017a:480) have chosen Galbraith's Star Model since projects can be viewed as systems for processing information. Furthermore, Miterev, Turner & Mancini (2017a:480) indicated in Table 3.2 that the five nodes of the star relate to the six strengths of the classically managed organisation that a PBO needs to retain. They also stated that the five nodes could be used to categorise recent research findings according to project-based categories.

Table 3.2 Six elements of organisational design of a PBO

Strength the functional hierarchy gives an organisation	Paper by Keegan and Turner	Corresponding element of the Star Model
Governance	Turner & Keegan (2000)	Strategy
Operational Control	Turner & Keegan (2000)	Process
Communication		Behaviour
Careers	Turner & Keegan (2000)	Human Resource
Individual Learning	Turner & Keegan (2001)	Human Resource
Organisational learning and innovation	Turner & Keegan (2002)	Process

Source: Miterev, Turner & Mancini *(*2017a)

Miterev, Turner & Mancini (2017a:485) proposed an additional Star Model, Figure 3.9, to denote antecedents affecting the design of the PBO. The components of the added-star mirror the components of Galbraith's star to which they are related most. They describe as:

> *" the decision to be project-oriented is a strategic decision that influences the overall strategy of the organisation; that decision says that project-based working is the main business process that will be adopted by the organisation; it also requires that the organisation structure should create a fit between the processes adopted and the decision to be project-oriented, between processes in the line and on projects, between processes in different functions; between the processes adopted and the context, the organisation must adopt a project culture so that behaviours in the organisation reflect project-based working; the churn that project-based working implies requires organisations to adopt human resource management approaches that reflect that churn."*

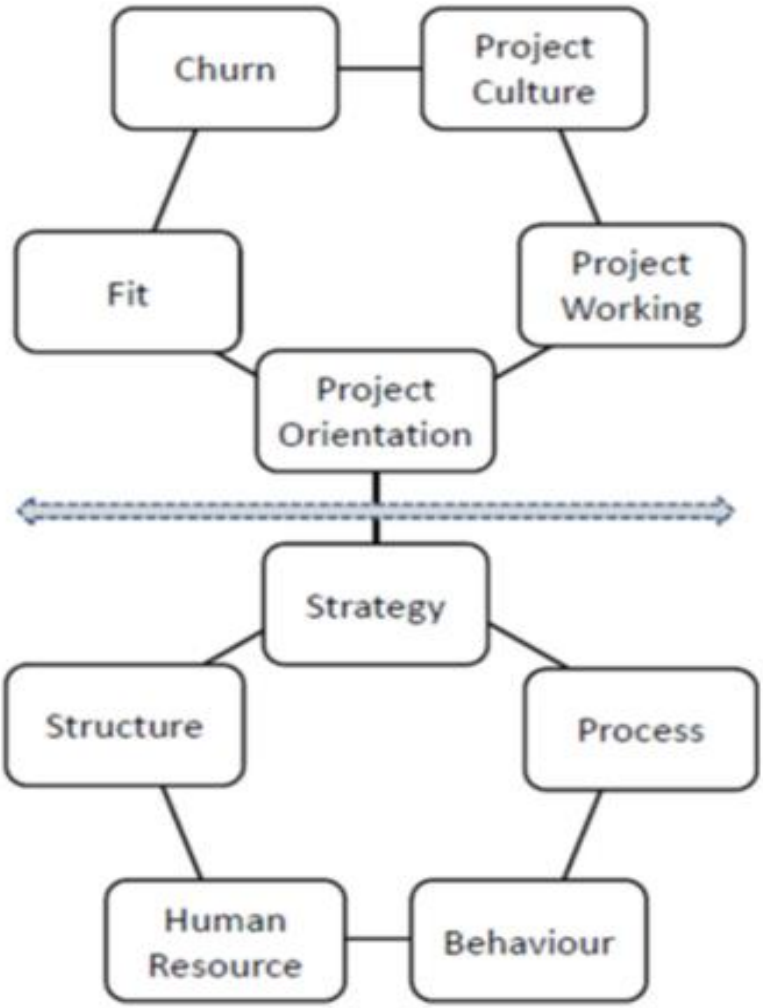

Figure 3.9: Factors influencing the design of PBOs

Source: Miterev, Turner & Mancini (2017a)

Eventually, through a literature review of both project management and general management literature, Turner & Miterev (2019:490) identified five additional antecedents within project management that appeared to have the potential to affect organisational design configurations. These five antecedents are listed in Table 3.3, including the organisation's history, size, the choice to be shareholder or stakeholder-focused, control by behaviours or results, and uncertainty, dynamism, and complexity. Turner & Miterev (2019:494) also confirmed that all ten contingency variables influenced the organisational design choices for the PBO.

Table 3.3 Antecedents of organisational design configurations of the PBO

Variable	Source
Project orientation	(Gareis & Huemann, 2007; Miterev, Turner & Mancini , 2017)
Project working	(Miterev, Turner & Mancini , 2017; Turner & Keegan, 2000)
Fitting structure to process	(Miterev, Turner & Mancini , 2017)
Project culture	(Miterev, Turner & Mancini , 2017)
Churn	(Huemann *et al*, 2007; Miterev, Turner & Mancini , 2017; Turner, Huemann & Keegan, 2008)
History and context of the organisation	(Bergman, Gunnarson & Raisanen, 2013; Miterev, Engwall & Jerbrant, 2017)
Size	(Turner *et al.*, 2009, 2010, 2012)
A shareholder versus stakeholder orientation	(Turner & Muller, 2014)
Control by behaviours or results	(Turner & Muller 2014)
Uncertainty, dynamism, and complexity	(Geraldi *et al*., 2011)

Source: Turner & Miterev (2019)

Turner & Miterev (2019:494) underlined that future research could challenge overcoming the limitations of static organisational design models. In their research interviews, Turner & Miterev (2019:494) found that most interviewees reflected on the changes in their organisational design, which had happened recently or much later (or both). Hence, while different organisational design models could serve as useful analytical tools to investigate PBOs, the designs should not be treated as everlasting. Thus, one of the promising lines of inquiry is to draw upon process studies and sense-making perspectives to investigate organisational redesign efforts in the context of PBOs (Aubry & Lavoie-Tremblay, 2018:12; Simard *et al*., 2018; Turner & Miterev,

2019:495). Miterev, Turner & Mancini (2017a:485) then focused on Bergman, Gunnarson & Raisanen (2013), who viewed ‘firm-based’ projects in PBOs as temporary organisations nested in and coupled to their parent organisations, Figure 3.10. Therefore, the design choices for temporary organisations should be aligned with the design choices of the PBO as a whole. The concept can be related to themes in the organisational design literature: disaggregation of large organisations into ‘molecular organisational units’ (i.e. projects in the case of PBOs).

Figure 3.10: Projects as temporary organisations nested in the PBO

Source: Miterev, Turner & Mancini (2017a)

3.4.1 Organisational Design Dimensions of the Modified Star Model

(a) Strategy

Companies do not become global giants overnight, and managers have to consciously adopt a strategy for development and growth (Daft, 2020:229). The choice of these goals and strategies influences how the organisation should be designed (Daft,

2020:50). Daft (2020:707) explained a strategy as a plan for interacting with the competitive environment to achieve organisational goals. Goals define where the organisation wants to go, and strategies define how it will get there. Daft (2020:68) explained how a strategy affects an organisation's design. He started by indicating that the choice of strategy affects internal organisational characteristics. He then explained that these organisational design characteristics must support the firm's competitive approach. For example, a company wanting to grow and invent new products looks and "feels" different from a company that is focused on maintaining market share for long-established products in a stable industry (Daft, 2020:68).

Regarding PBOs, Turner (2009:16) explained objectives and strategies in the self-explanatory diagram in Figure 3.11. The figure illustrates a cascade of objectives at different levels of management, from development objectives for the parent organisation down to task objectives for individuals. The strategy for achieving that level's objectives at each level will imply the next level's objectives. It is in contrast with the tendency within project management studies to view strategy as something that emerges (or not) through various combinations of interactions between the formal "project" and "organisational" levels.

Lowstedt, Raisanen & Leiringer (2018:897) argued that a strategizing pattern integrates and creates significant organisational outcomes in the PBO that rest firmly upon overlapping practices and roles, making the boundaries of such an interface space much more blurred and ineffective.

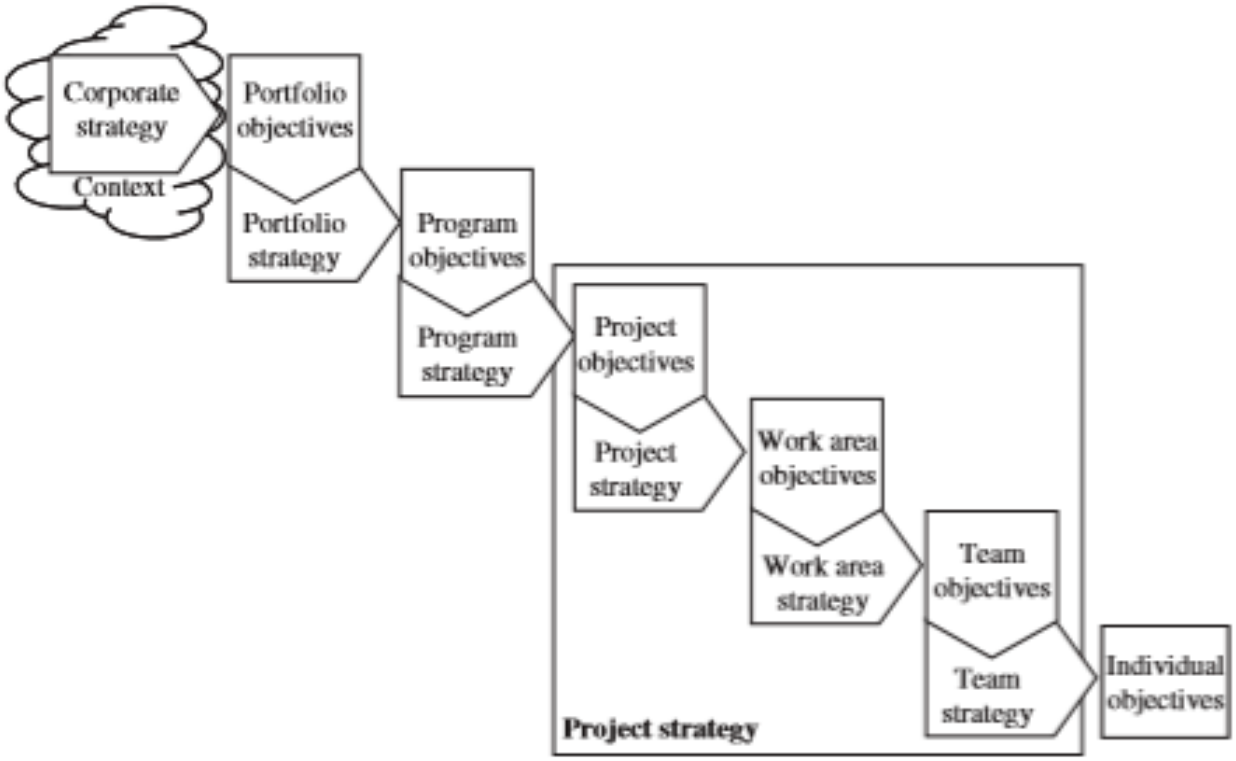

Figure 3.11: A cascade of strategies and objectives at different levels of PBO

Source: Turner (2009)

Under the dimension of "strategy" of the Modified Star Model, the alignment of projects with corporate strategy and governance were the most addressed areas in the literature (Miterev, Turner & Mancini, 2017b:537).

(b) Process

Process defines an organised group of related tasks and activities working together to transform inputs into outputs and to create value for customers (Daft, 2020:24). Stanford (2007:303) and Kates and Galbraith (2007:17) explained a business process as an end-to-end series of activities starting with inputs to a product or service and ending with the output.

According to Kates & Galbraith (2007:17), a process includes:

> *"…work processes, such as developing a new product, closing a deal, or filling an order. It also includes management processes, such as planning and forecasting sales, business portfolio management, price setting, standards development, capacity management, and conflict resolution. Processes that cross organisational boundaries force organisational units to work together. Their design has a significant impact on how well units work together vertically or laterally. Clear articulation of roles and responsibilities at the boundary interfaces is essential for the design of good processes."*

Under the process dimension of the Modified Star Model: capability, management practices, integration, and business models were the most addressed areas in the literature (Miterev, Turner & Mancini, 2017a:537).

(c) Structure

All organisations, be they industrial firms, construction firms, schools, or civil service departments, are structured. That is to say, there are relatively defined relationships between different employees and more or less regularised procedures for carrying out the organisation's business. An organisational structure is a complex phenomenon which can be viewed in many ways (Mansfield, 2013:62). Mansfield (2013:65) suggested that no claim can be made that any particular breakdown of the dimensions of the structure is necessarily better than alternatives. Still, examining the literature in light of the ideas developed so far, it is possible to suggest useful breakdowns.

According to Mansfield (2013:65-77), the breakdowns need to depend on the different key areas of organisations: division of labour, coordination, organisational size, and technology. Petro & Gardiner (2015:1720) also mentioned that the structural design of organisations depends on the organisation's strategy, size, surrounding environment, use of technology, and the types of power that reside within.

Regarding designing a new structure, Stanford (2007:46) suggested an early assessment be made to determine whether the current structure: directs sufficient management attention to the sources of competitive advantage in each market; helps the corporate centre add value to the organisation; reflects the strengths, motivations, and weaknesses of the people; protects units that need distinct cultures; provides co-ordination for the unit-to-unit links that are likely to be problematic; has too many management levels and units; supports effective controls; facilitates the development of new strategies; provides the flexibility required to adapt to change; reflects the complexity of markets, and industry relationships being sufficiently straightforward for stakeholders to work with.

Stanford (2007:46) also remarked that there is no single choice of approach. The basic principle is to ensure that there is no conflict between the proposed approach and the prevailing style of the organisation. Stanford (2007:48-49) also stated that the development of organisational theory typically gives rise to different organisational models, which in turn give rise to different organisational structures. Stanford attempted to show their relations as listed in Table 3.4.

The discussions above indicated that under the Modified Star Model's structure dimension, portfolios and programs, project offices, and organisation structure were the focus areas of most literature (Miterev, Turner, & Mancini, 2017b:536)

Table 3.4 Organisational Models and Structures

Theory	Model	Structure
Scientific Management	–	Functional
Systems theory (closed and open)	McKinsey's 7-S Model Galbraith's Star Model Nadler's Congruence Model Weisbords's Six Box model Burke-Litwin's Model	Divisional Matrix/ project
Complexity theory	Nadler's Updated Congruence Model Kilmann's Model Wilber's AQAL Model McMillan's Fractal Web Model Holonic Enterprise Model	Network Virtual No structure yet emerging for this Model Life Form (Institutions as living beings) Cluster, Virtual

Source: Stanford (2007)

(d) Behaviour

Culture, change management, power, decisions, social networks, stakeholders, ethics and trust, and communication were the areas considered under the behaviour dimension of the Modified Star Model (Miterev, Turner & Mancini, 2017b:536). According to Miterev, Turner & Mancini (2017a: 484) and Turner *et al*. (2010), it is common in the literature to distinguish between behaviour and human resource management. Behaviour is more related to the process. Muller (2009) offers behaviour as one of two control mechanisms in organisations (the other being goals) and says that control by behaviours ensures adherence to process. Culture, change management, and change were the topics under the behaviour dimension of the Modified Star Model, which received more attention in the literature (Miterev, Turner & Mancini, 2017b:536).

(e) Human Resource

Bredin and Soderlund (2011:27) identified a set of features distinctive for PBOs: Goal-oriented, team-oriented, knowledge-intensive, temporary, interdisciplinary and cross-functional, multi-employment organisation and intentional. These distinctive features are essential to understanding this particular organisational setting and, therefore, equally essential to the success of Human Resource Management (HRM) in PBOs. Bredin and Soderlund (2011:27) gave their thoughts on HRM in PBOs:

> *"Designers of organisational structures need to know more about the preconditions of creating the best organisational structures and related support systems to ensure the viability of PBOs. It also means that managers must be able to design HRM systems particularly suited to the needs of the PBO and the people who occupy them. Finally, the people and individual workers themselves must know how to live, learn, and create a good working situation in an organisation that carries out its core activities in projects.*

The competence of individual project managers and HRM practices were the topics under the human resource dimension, receiving more attention from the literature (Miterev, Turner & Mancini, 2017b: 538).

3.4.2 Antecedents influencing the design choices of PBOs

Miterev, Turner & Mancini (2017a: 485) proposed the first five antecedents, namely project orientation, project working, fitting structure to process, project culture, and churn, and related them to respective organisational design dimensions mentioned in the previous section. Then, building on the contingency stream of research within extant project management literature, Turner & Miterev (2019:489) explored other five contingency variables influencing PBOs' organisational design choices (dimensions). Next, the ten identified antecedents of organisational dimensions of PBOs will be discussed.

(a) Project orientation

Project-oriented organisations consider projects not only as ways of performing processes but as a strategic option for the company's organisational design. “Management by Projects” is the organisational strategy of firms dealing with an increasingly complex business environment (Gareis & Huemann, 2007:184-185). Therefore, PBOs should intentionally make a strategic decision to be project-oriented (Turner & Miterev, 2019:488). Gareis & Huemann (2007:185) further opined that the measures listed below are required to implement “Management by Projects”.

(i) Not only permanent structures but also temporary organisations need to be shown on the organisational chart.
(ii) Project-related functions should be incorporated into the job descriptions of all managers.
(iii) The strategic importance of project management should be incorporated into the company's mission statement.
(iv) Promoting project management need appropriate marketing measures.

(b) Project working

The classical management theory works well, and is highly appropriate, where the organisation's work is stable. But classical management theory is not appropriate for PBOs since every customer’s requirement is different, unique, novel, and a transient project must be undertaken to deliver every order (Turner, 1999; Turner & Keegan, 2000:133). These are why PBOs require a different approach to their management from the functional hierarchical line-management approaches (Turner & Miterev,2000:131).

At PBOs, project-based working is the primary business process that needs to be adopted (Miterev, Turner & Mancini , 2017a:485). The operational processes in PBOs involve winning the customer’s order; designing the product and the process of its delivery; producing the components of the product; configuring the components of the product; commissioning the product, delivering to the customer and maintaining customer support after delivery (Turner & Keegan, 2000:134).

Therefore, in a PBO: project, program, and portfolio management are the processes adopted for delivering products and services to customers. Since the processes adopted by the PBO use projects, programs, and portfolios, Miterev, Turner & Mancini (2017a: 486) opined that the embedding of projects is appropriate for the design of PBOs, as is shown in Figure 3.10 above.

(c) Fitting structure to process

Galbraith (2014), developing his Star Model, explained that there must be an alignment between the five elements of the model. The Modified Star Model, Figure 3.8, consists of five elements as the nodes of a pentagon, with the "Alignment" at the centre of the star, stressing that the five elements must be consistent with each other and with organisational strategy (Miterev, Turner & Mancini , 2017a: 483).

An organisational unit's performance results from aligning its external context and internal arrangement (Van De Ven, Ganco & Hinnings, 2013:424; Miterev, Turner & Mancini, 2017b: 536). Therefore, the structure should create a fit between the decision to be project-oriented and the processes adopted, between processes in projects and the line and between processes in different functions, and between the processes adopted and the context (Miterev, Turner & Mancini , 2017a: 486).

(d) Project culture

Miterev, Turner & Mancini (2017a:487) have described the difficulty of creating a project culture and the way to deal with it as:

> *"Projects, which are temporary organisations, cannot provide the organisation with cohesion and culture. Being temporary, they damage cohesion and cannot define the culture of the organisation. Cohesion and culture must be provided by the functional organisation, but it needs to recognize that project and program management are the primary business processes adopted, and adopt an appropriate culture. The ability of the functional organisation to do that has been described as projectivity (Turner, 2014)."*

A Project-oriented organisation adopts a project management culture, which makes it better able to deal with change, uncertainty, contradiction, and collaboration. Functional managers may be hesitant to adopt a project culture. In a classically managed organisation, the functional hierarchy is the governance structure for internal transactions in PBOs (the project should be the governance structure for both external and internal transactions). Still, functional managers could be unwilling to release control to project managers. The company that makes the strategic decision to be project-oriented must adopt a project-oriented culture by addressing the balance between the functional and project managers and adequately rewarding them for their contribution to the bottom line. Line and project managers must adopt appropriate behaviours (Miterev, Turner & Mancini , 2017a: 486-487).

(e) Churn

Human resource management (HRM) can be considered the core process of the project-oriented company, touching on how the organisation acquires and uses human resources and how employees experience the employment relationship. However, HRM is framed primarily in terms of stable, large organisations. At the same time, other organisational types, such as those relying on projects as the primary form of work design, are marginalised in discussions about what HRM is and how it should be practised (Huemann *et al.,* 2007:315).

In an analysis of the novelty in forms of organising, Puranam, Alexy & Reitzig (2014:3), emphasised that a new form embodies new solutions to the basic problems of organising—the division of labour and the integration of effort—in contrast to the solutions used by existing organisations. According to Puranam, Alexy & Reitzig (2014:3), the novel design is

> " …*the solution to the four problems of organizing: task division; task allocation; reward provision; and information provision. They have defined each as a form of mapping: from goals to tasks (task division); from tasks to agents (task allocation); from rewards to agents (reward provision); and information to agents*."

A PBO is a new form of organisation with constant churn in the elements of organisational design (Huemann *et al*., 2007; Miterev, Turner & Mancini *,* 2017a:482). The churn that project-based working implies requires organisations to adopt human resource management approaches that reflect that churn (Miterev, Turner & Mancini *,* 2017a:485). Every time a project starts or finishes the human resource configuration of the organisation changes. People must be assigned to projects and reassigned at the end of projects. HRM practices must be applied both on the project and to the project managers; line staff, line managers, and human resource managers share responsibility for managing people on projects. Churn is one of the factors creating higher stress for employees (Miterev, Turner & Mancini*,* 2017a:487- 488).

(f) History and context of the organisation and its leadership

Projectification history is connected with two parallel movements with a push towards decoupling encountered and a pull towards standardising project management practices to tighten the coupling. Firm-based projects are temporary organisations embedded in and coupled with their parent company (Bergman, Gunnarson & Raisanen, 2013:106). In the context of a PBO, one would expect relatively strong isomorphic processes in projects. Isomorphism is considered a constraining process that forces one unit in a population to resemble other units facing the same set of environmental conditions (Miterev, Turner & Mancini , 2017:10). The classic analytical typologies of isomorphic mechanisms are coercive, mimetic, and normative (Miterev, Turner & Mancini , 2017:12).

According to Miterev, Turner & Mancini (2017:12), typologies are explained as follows:

> "*Coercive mechanisms are related to external pressures exerted on organisations both by other organisations and wider society. Mimetic mechanisms are related to imitation among organisations, commonly triggered by environmental uncertainty. Normative mechanisms are related to the effects of a shared cognitive base and emerge primarily from professionalization."*

These isomorphic mechanisms also heavily influence PBOs' organisational design dimensions, as depicted in Table 3.5.

Table 3.5: Isomorphic mechanisms within the PBO

Isomorphic Mechanisms	Specific Mechanisms	Affected Temporary organisation Design Dimensions			
		Structure	Strategy	Process	People
Coercive	Prescriptive guidelines and frameworks	x	x	x	x
	Project management assurance system and internal audits	x		x	
	Expectations of steering group members	x	x	x	
Mimetic	Post-closure and lessons learned reports	x		x	
	Sharing of approaches within formal communities of practice			x	
	Informal networking within unofficial groups/coalitions of managers	x	x	x	x
Normative	Influence of professional Associations	x		x	
	Influence of popular management models and broader societal norms			x	
	Influence of industry-specific norms		x	x	
	Similarity of the managers(due to HRM practices)				x

Source: Miterev, Engwall & Jerbrant (2017)

(g) Size

Size is an important contingency variable affecting an organisation's design (Miterev, Turner & Mancini, 2017a: 495). Smaller firms are less likely to employ dedicated project managers. Therefore, in SMEs, particularly micro-sized firms, projects will be managed by people for whom project management is not their main skill. Turner *et al*. (2009) showed that what causes the transition from small to medium-sized firms with around 50 employees is that medium-sized firms are more likely to employ specialist staff. In contrast, micro and small firms employees are more likely to multi-task, being more able to fulfil several roles on a project (Turner *et al*., 2012:943).

(h) A shareholder versus stakeholder orientation

In organisations with a shareholder orientation, the sponsor (who represents the shareholders) is the key stakeholder, whereas, in organisations with a stakeholder orientation, the end-users are the key stakeholders. There is better trust between project managers and stakeholders in organisations with a stakeholder orientation than those with a shareholder orientation (Turner & Muller, 2014:80). Organisations adopting a stakeholder orientation with outcome control are more likely to empower project managers, whereas organisations adopting a shareholder approach are the least likely. Still, the consequence is that project managers in the former case face more temptations. In contrast, project managers in the latter are the least (Turner & Muller, 2014:80). Moreover, project managers in the stakeholder-oriented organisation with an outcome control approach are the least likely to seek help. In contrast, project managers in the shareholder approach are most likely to seek help and will seek help from their supervisor (the representative of the shareholders) (Turner & Muller, 2014:80).

(i) Control by behaviour or results

Muller, Pemsel & Shao (2015:848) developed four paradigms for project management governance based on whether behaviours or results control the organisation; that is, it defines how people should do their jobs or what outcomes they should achieve. Project managers in organisations that control outputs suffer the greatest temptation to overstate what has been achieved. In contrast, project managers in organisations "controlled by behaviours" are most likely to overstate what has been done (Turner & Muller, 2014:80).

PBOs are complex entities involving multiple institutional orders and operating under multiple institutional demands at various levels. For example, the regulative elements (formal regulations and laws) in a pharmaceutical PBO are different from business improvement and drug development projects, where the former are exposed to more external and internal regulations and control. It influences the normative elements (standards, roles, conventions, and practices) appropriate for each project type and the

nature and importance of different cultural-cognitive elements like shared beliefs, logic of actions, and identities (Muller, Pemsel & Shao, 2015:848).

(j) Uncertainty, dynamism and complexity

Uncertainty relates to the current and future states of the elements that make up the system being managed, how they interact, and the impact of those states and interactions. For managers, uncertainty is experienced as an inevitable gap between the information and knowledge required to decide what is available. Uncertainty is involved in the creation of something unique and the solving of new problems. In the literature reviewed, the indicators of uncertainty are new technology, experience, availability of information, whether the information needed for decisions is available, and level of ambiguity, as shown in Table 3.6 (Geraldi *et al.*, 2011:19-20).

Complexity is a critical, independent variable that impacts many successful project management decisions. Structural complexity, the most mentioned type in the literature, is related to many distinct and interdependent elements. Most articles define structural complexity based on three attributes: size, variety, and interdependence, as depicted in Table 3.6 (Geraldi *et al*., 2011).

Dynamics refers to project changes, such as specifications, suppliers, management teams, or the environmental context. These changes may lead the project to high levels of rework, disorder, or inefficiency when changes are not well-communicated or assimilated by the team and others involved. Therefore, the most suitable attribute embracing all indicators related to dynamic complexity is “a change in any of the other dimensions of complexity” (Geraldi *et al.*, 2011:21).

Table 3.6 Attributes of dimensions of uncertainty, dynamism and complexity

Dimension	Attributes
Uncertainty	.Novelty .Experience .Availability of Information
Structural Complexity	.Size(or number) .Variety .Interdependence
Dynamic	Change

Source: Geraldi, Maylor & Williams (2011)

3.5 PBO Design Fundamentals

Organisations trying to change their environment to support projects report difficulty with the process because creating an environment for successful projects is not done in a vacuum. Instead, it is usually done within the prevailing organisation. Typically, the existing organisation is not a project organisation, so creating an environment for projects within such an alien organisation can be difficult for several reasons mentioned before (Englund & Graham, 2019:29).

Various organisations have attempted to integrate projects into their functional organisations using the matrix approach in which functional managers control departments and the project managers coordinate the work across functions. But matrix organisations tend to experience more problems than they solve. Moreover, a marginal change is a mere modification of the old hierarchical organisation. As a result, the typical bureaucratic problems continue to be prevalent.

The weakness of bureaucracy brought the tenets of an organic organisation (post-bureaucratic organisation) into focus. Everyone takes responsibility for the success of the whole in organic organisations (Englund & Graham, 2019:11-13). Therefore, a new

form of organisation emerged, a Project-based organisation (PBO) (Puranam, Alexy & Reitzig, 2014:3).

The designs of organisations directly affect the performance and behaviour of millions of workers and organisations every day, as well as the aggregate productivity and well-being of economies worldwide (Van De Ven, Ganco & Hinnings , 2013:395). Turner & Miterev (2019:488) have stated that organisational design is getting explicit attention in literature at multiple levels, including projects, multiple projects (Aubry & Lavoie-Tremblay, 2018:12), and Project-based organisations as a whole (Miterev, Turner & Mancini, 2017a, 2017b). An organisation's design can be based on one of several seminal models (Van De Ven, Ganco & Hinnings, 2013: 482). Miterev, Turner & Mancini (2017a:479) adopted and modified the Star Model (2014) among the seminal models for the organisational design of PBOs.

The Modified Star Model is the theoretical foundation of this study. An organisational design addresses the antecedents, interactions, and consequences of various facets of an organisation, which are sometimes referred to as organisational design elements or dimensions (Turner & Miterev, 2019:488). Miterev, Turner & Mancini (2017a:479) identified five organisational dimensions: strategy, process, behaviour, human resources, and structure. The ten antecedents that influence the organisational design choices of PBOs were identified earlier (Miterev, Turner & Mancini , 2017:485; Turner & Miterev, 2019:494).

3.6 Salient Issues from Literature

Many literature reviews have indicated that construction projects being executed by local construction firms face noticeable schedule slippages and cost overruns. The low capacity of the local contractors was identified as the underlying reason for their poor project performance.

Organisational transformation requires and is accomplished through improving the strategy, structure, and work processes of organisations which are referred to as organisational design dimensions. Organisational design is a major factor that determines an organisation's performance and how the people work together in these organisations. The redesign of local construction firms is vital for their transformation to be competitive in a prevailing fierce market.

Organisations in dynamic industries, including construction firms, must be organically organised to deal with an uncertain environment. In this Chapter, the background of organisational design and the different seminal models of the organisational design were initially discussed. An organisational design addresses antecedents, interactions, and consequences of various facets of an organisation, which are sometimes referred to as organisational design elements or dimensions (Turner & Miterev, 2019:488)

A Project-based Organisation (PBO) is an organisational form suitable where business activities are implemented and managed around projects. It was also noted that PBOs are organisational forms flexible enough to adapt to a dynamic environment, enabling the development of management systems that provide strategic and operational excellence. A construction company is an example of a PBO as it executes most of its activities through construction projects which are unique and uncertain and have short life cycles. Therefore, project integration through a matrix structure can only bring a marginal change.

Construction firms must be transformed into full-fledged PBOs to create a favourable project environment. The different characteristics of PBOs were covered in this chapter, including a strategic emphasis on projects, programs, and portfolios; the concept of core teams; development of project management in the organisation; top management's

influence; organising for project management; developing of a learning organisation; planning for project manager selection, and a project management information system.

The other focus of discussion was PBO organisational design. The study's theoretical foundation, the Modified Star Model, was then discussed in detail. The Star Model is a well-established model designed by Galbraith (1977) in the 1960s. The Star Model was modified in 2017 by Miterev, Mancini & Turner to turn it into a holistic model for PBOs. The dimensions of the Modified Star Model: strategy, process, behaviour, human resource, and structure were then addressed. Also, ten antecedents influencing PBO design choices (dimensions), further identified by Turner & Miterev (2019), were explained. Finally, the fundamentals of a PBO design were summarised. It was noted in the literature review that Ethiopian local construction firms were not able to improve their organisational capability, systems, and processes using their present-day static bureaucratic arrangements.

3.7 Research Conceptual Model

The well-established Star Model (Galibrath, 2014) was modified to suit the organisational design of PBOs by Miterev, Turner & Mancini in 2017 and serves as the theoretical foundation of this study. The model has identified five organisational design choices (dimensions) with alignment at the centre, emphasising that the elements must align with each other (Miterev, Turner & Mancini, 2017). This model needed to be contextualized, as earlier suggested by the Modified Star Model researchers (Miterev, Turner & Mancini, 2017a:489).

Different characteristics of PBOs identified from the project management literature are to be verified in the context of the ECI and incorporated into the conceptual model. The contingency theory of organisation design indicates that the performance of an organisational unit is a result of the alignment between its internal arrangements and external context. Therefore, the relationship between the organisational design dimensions (strategy, process, structure, human resource, and behaviour) and salient characteristics of full-fledged PBOs are investigated. Also, the Modified Star Model did not address the relationships between the identified antecedents and organisational dimensions (Miterev, Turner & Mancini, 2017a:489). This study intends to fill the above knowledge gap by developing a contextualised model that could help to transform ECFs into full-fledged PBOs.

Businesses, more than ever, need models that provide them with the agility and flexibility required for survival and growth in a challenging economic framework (Oussama, Othmane & Zitouni, 2013:49). Dlungwana & Rwelamila (2005:4214) requested contractor development models that are integrative and holistic in their approach and beneficial for global competitiveness, sustainable business growth, sound environmental management, and the socio-economic development of developing countries. There is a broad acknowledgement of organisational design as a study area (Puranam, Alexy & Reitzig , 2014:3; Van De Ven, Ganco & Hinnings, 2013).

The diversity and complexity of contemporary organisations have made it not practical to study them with a single model or theoretical perspective. Consequently, it might be helpful to focus on a particular type of organisation at a time (Turner & Miterev, 2019:489). Therefore, this study focuses on the organisational design of Ethiopian construction firms. Ethiopian construction firms (ECFs) need a contextualised and holistic model to be transformed into a full-fledged PBO. Therefore, a conceptual research model was developed (Figure 3.12) based on the theoretical Modified Star Model (Galibrath, 2014; Miterev, Turner & Mancini, 2017a).

The conceptual research model depicted the possible transformation of ECFs into full-fledged PBOs by redesigning their strategy, structure, process, behaviour, and human resource dimensions. Awale and Rowlinson (2014:1286) stated that competitiveness is a concept that is principal to normatively oriented strategic thinking and can mean different things to different firms at different times. It is a multidimensional concept that can be analysed at different levels: project, firm, industry, and country level (Bhattacharya, Momaya & Iyer, 2013:45). Competitiveness at a firm level is the level where honest competitive business endeavours. It is also the level where competitive strategies can be formulated, implemented, and results can be analysed. To be competitive Ethiopian construction firms need to become full-fledged PBOs, embracing the different PBO characteristics. Chapter 4 will discuss the methodology used for verifying the literature findings.

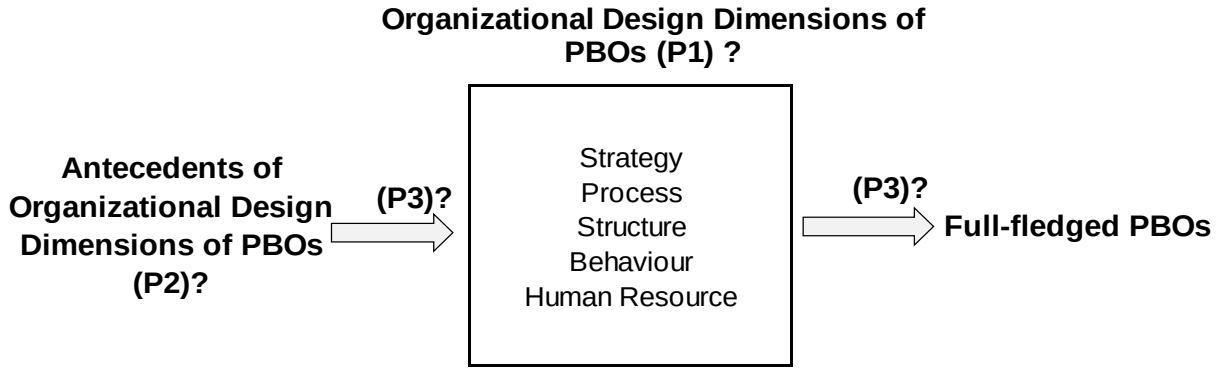

Figure 3.12: A research model to transform Ethiopian construction firms

Source: Adapted from Galibrath (2014) and Miterev, Turner & Mancini (2017a) supplemented by the author

CHAPTER 4: RESEARCH METHODOLOGY

4.1 Introduction

The main objective of this study, explained in Chapter 1, was to develop a conceptual model for transforming Ethiopian Construction firms (ECFs) into full-fledged Project-based organisations (PBOs). Conceptual Models and their development were discussed in Chapter 2. Finally, Chapter 3 focused on the theory and practice of PBOs. A construction firm is inherently an example of a PBO as it executes most of its activities through projects with short life cycles.

This Chapter discusses the methodological choice essential for developing a contextual transformational model for ECFs, focused on their organisational design. First, the philosophical stance, which guides the methodological choice of the study, is addressed. Then the reason for choosing an exploratory sequential mixed-method approach is discussed. Furthermore, the design of the measuring instruments for the qualitative and quantitative study is explained.

The qualitative and quantitative data collection and analysis procedures are discussed, including the quality and rigour of the qualitative research. The final section of this chapter will discuss the approach implemented to enhance the validity and reliability of the quantitative study and the consideration of ethical issues in the study.

4.2 The Research Paradigm

Research philosophy is described by Saunders, Lewis & Thornhill (2009:600) as the development of knowledge and the nature of research knowledge. Research philosophy is the basis for research design and methods. Though philosophical ideas seem hidden, they still impact the research practice and need to be identified (Creswell & Creswell, 2018:42). Epistemology, axiology, and ontology are three major ways of explaining the research philosophy. They constitute significant differences that affect how the researcher perceives the research process (Saunders, Lewis & Thornhill, 2009:128).

Saunders, Lewis & Thornhill (2009:119) explained epistemology, axiology, and ontology as follows:

> *"Epistemology concerns what constitutes acceptable knowledge in a field of study. Axiology studies judgements about value. Specifically, axiology is engaged with assessing the role of the researcher's value at all stages of the research process. Ontology is a branch of philosophy concerned with the nature of social phenomena as entities. The two aspects of ontology, subjectivism and objectivism, have their devotees among business and management researchers.*"

There are four research philosophies of management research: positivism, realism, interpretivism, and pragmatism (Saunders, Lewis & Thornhill, 2009:119). They explain a pragmatic worldview as a philosophy that accepts concepts to be relevant only if they support action. This worldview recognises that there are different ways of interpreting the world and undertaking research, that no single point of view can ever give the whole picture, and that there may be multiple realities.

This study regarding epistemology is classified under pragmatism as it focuses on answering the "what" and "how" type of research questions: what are the antecedents and organisational design dimensions of Ethiopian construction companies, and how could they become transformed into full-fledged Project-based organisations (PBOs). Creswell & Creswell (2018:46) explained pragmatism as a worldview that arises from actions, situations, and consequences rather than antecedent conditions, as in post-positivism. Therefore, this study aims to identify the dimensions of the organisational design, their antecedents, and how to transform them into full-fledged PBOs that need action and could be answered through a mixed-method approach.

Ontology is concerned with the nature of reality. Objectivism is an ontological stand that holds that social entities exist in reality external to social actors. In contrast, the subjectivist view is that social phenomena are created from social actors' perceptions and consequent actions (Saunders, Lewis & Thornhill, 2009:128). This research adopts

predominately a subjectivist view supplemented by an objective point of view. The different views of individuals with sufficient knowledge and experience of the ECI are crucial to understanding the reality regarding ECFs.

Saunders, Lewis & Thornhill (2009:110) clearly explain axiology and value as follows:

> *"Axiology is a branch of philosophy that studies judgments about value. Although this may include values we possess in the fields of aesthetics and ethics, it is the process of social inquiry with which we are concerned here. The role that your values play in all stages of the research process is of great importance if you wish your research results to be credible."*

Values play a significant role in interpreting results in research following a pragmatic philosophy like in this study. This research adopts subjective and objective points of view, but the subjective point dominates.

4.3 Research Design

Adams, Khan & Raeside (2014:64) described a research design as a blueprint designed to meet research objectives and reply to research questions. A research design refers to the plan used to examine the question of interest or the many ways in which research can be conducted to answer the question being asked (Marczyk, Dematteo & Festinger, 2005:22). The primary objective of this research is to develop a conceptual model to enable Ethiopian construction firms (ECFs) to transform into full-fledged PBOs by focusing on the organisational design dimensions and their antecedents.

Saunders, Lewis & Thornhill (2009:139) classified research designs as exploratory, explanatory, and descriptive. Exploratory studies are usually undertaken to find out 'what is happening; to seek new insights; to ask questions and to assess phenomena in a new light '. According to Saunders, Lewis & Thornhill (2009:140), there are three principal ways of conducting exploratory research: searching for literature, interviewing experts, and conducting focus group interviews. One of the main features of exploratory

research is that it is highly flexible and adaptable to change (Saunders, Lewis & Thornhill, 2009:139).

Descriptive research aims to portray an accurate profile of events, persons, and situations (Saunders, Lewis & Thornhill, 2009:140). The drawback of descriptive research is that there may be a lack of conclusions drawn from the data. It may not answer the question so what? In the academic field, any data collected must be synthesized and evaluated for a conclusion to be reached. Therefore descriptive research is usually a prelude to either explanatory or exploratory research. Explanatory studies try to study the causal relationships between variables. The emphasis of the exploratory study is on learning about a situation or a problem to explain the relationships between variables (Saunders, Lewis & Thornhill, 2009:140).

An exploratory research design is preferred for this study as it helps to identify the core organisational design dimensions and their antecedents necessary for ECFs to be transformed into full-fledged PBOs. Furthermore, the research provides new insights into the organisational design of ECFs demands using an exploratory research design.

4.4 Research Approach

There are two approaches through which a researcher can either test a theory or build a theory, a deductive approach and an inductive approach. Researchers follow the deductive approach to build theories or hypotheses before empirically examining them to determine their validity. The inductive approach starts with observations describing a social phenomenon and then progresses to interpret and explain the collected data (Crowther & Lancaster, 2009:31). This study follows a hybrid approach. It will be mainly inductive since the main objective is to have a closer understanding of the organisational design of ECFs to create a conceptual model to transform them into full-fledged PBOs. A deductive approach will be applied to analyse data from samples of sufficient size to generalise the conclusion.

4.5 Research Strategy

Different strategies could be designed for different types of research. According to Saunders, Lewis & Thornhill (2009:141), the selection of a research strategy is determined by the research questions and objectives, the extent of existing knowledge, the mode of time and resources available, and the philosophical foundations.

The main research question and sub-research questions are:

Main-Research Question (MRQ):

MRQ: How could the local construction firms in Ethiopia become transformed into full-fledged Project-based organisations?

Sub-Research Questions (SRQs):

SRQ1: What core dimensions of the organisational design are parts of the fundamental requirements for local Ethiopian construction firms?

SRQ2: What key antecedents of organisational design dimensions are necessary for Ethiopian construction firms?

SRQ3: What should the conceptual model be for transforming Ethiopian construction firms into full-fledged project-based organisations?

The pragmatist philosophical stance of this study opens the door to mixed methods. A mixed-method research strategy could answer the above “what” type of research questions. Qualitative research is a means of exploring and understanding the meaning individuals or groups ascribe to a social or human problem. This research starts with a qualitative study. But the research also needs a quantitative strategy so that it can be able to generalize results to a population (Creswell & Creswell, 2018:50). Mixed methods research is an approach that tries to combine or associate both qualitative and quantitative methods. The mixed design is preferred if the whole strength of the

research is anticipated to be higher than either qualitative or quantitative research (Creswell & Creswell, 2018:46).

An exploratory sequential mixed method, among the different types of mixed research designs, is a design in which a researcher first begins by collecting and analysing qualitative data and then builds a framework or model to be tested in the quantitative phase. Similar to the explanatory sequential approach, the second feature builds on the initial phase results. Such a design intends to explore an initial sample so that a later quantitative phase can be tailored to meet the needs of the individuals being considered (Creswell & Creswell, 2018:295). An exploratory sequential mixed method is preferred for this study since it intends to discover the organisational design dimensions of ECFs and their antecedents. In addition, an exploratory sequential mixed method is effective in tapping into the minds of experienced individuals in the ECI regarding the organisational design of local construction firms.

The research design of this study is a QUAL-quant sequential study. It involves an initial qualitative interview for exploratory purposes in the context of ECI, followed by a quantitative survey method using a larger sample size. The quantitative study selecting samples of sufficient size from the ECI would help to generalise and reach a conclusion. The qualitative study is done through a semi-structured interview with purposefully selected top managers of stakeholders in the ECI containing sufficient knowledge and experience of ECFs and ECI. Then a questionnaire is developed from the detailed literature review and findings of the qualitative study. The study is a cross-sectional study done within a short time. To summarise, the study will be mainly inductive, exploratory sequential mixed method, and cross-sectional.

4.6 Research Methods

4.6.1 Sampling Techniques

Sampling is the process of selecting a sample group of cases from the larger ECI population. If the data you collect from a sample group is the same as you would get from the rest, then you can conclude those answers relate to the whole group (Walliman, 2011:93). Sampling is further explained by Emmel (2013:48) as a valuable tool in research because, when dealing with a very large population, it might be impossible to study the whole population. It will also take a lot of time and money, and the results may not be precise as changes occur in the population over time. Later thoughts may differ significantly from previous ones. Also, the process may be unmanageable and the results skewed (Emmel, 2013:48).

(a) Sampling Techniques-Qualitative

Interviews can be configured to collect data from individuals, couples, families, and groups (Creswell, 2014:239). In a qualitative interview, a researcher can conduct face-to-face interviews with participants, telephone and video conference interviews, or focus group interviews. Different qualitative theorists suggest different optimal sample sizes for interviews. For example, Thomas and Polio (2002) suggested that the appropriate size range is from 6 to 12 participants. On the other hand, Gubrium, Holstien, Marvasti, & Mckinney (2012:244) recommend a range between 2 to 10. Another approach to determining sample size in qualitative studies is the idea of saturation. Saturation is when, in qualitative data collection, a researcher stops collecting data because new data no longer sparks new insights or reveals new properties (Creswell, 2014:239).

Creswell (2014:240) explained purposefully selected participants as individuals selected by the qualitative researcher to understand the research problem and questions well. For the qualitative part of this study, respondents for the interview will be purposefully selected from ECI stakeholders based on their knowledge and experience in the ECI. The number of interviewees will be determined when the research reaches a saturation point, and sufficient insights regarding answers to the research questions have been

acquired. But as a start, it was planned as 12. The interviews were conducted with purposefully selected individuals from major stakeholders of the ECI, including Grade I Contractors, Grade I consultants, a regulatory body, a capacity-building institute, and prime project owners.

(b) Sampling Techniques- Quantitative

I. Study Population

The question that inevitably arises when doing a survey is: How representative is the sample of the whole population? In other words, how similar are the characteristics of the cases chosen for the interviews and survey to the whole group? A study population in research does not necessarily mean the total number of people. It is a collective term that describes the total quantity of things (or cases) selected as research subjects. So a population can consist of certain types of objects, organisations, people, or events (Walliman, 2011:94). The study population of this research included the different stakeholder organisations in the ECI. Hair, Black, Babin & Anderson (2014:640) defined the unit of analysis as the unit or level to which results apply. The unit of analysis of this study was Grade I contractors in the ECI. A Grade I contractor represents the highest level category of contractors in the ECI according to the MoUDC classification. This study is focused explicitly on Grade I contractors as they are the ones facing fierce competition from the international construction giants.

II. Sampling Frame

Within a study population, there will probably be only certain groups that will be of interest to a study. The selected category is called the sampling frame, and it is from this sampling frame that the sample is selected(Walliman, 2011:94).

For the quantitative part of this study, the sampling frames were:

- Grade I Contractors (General, Building, Road, and Specialised Contractors) (registered for 2020/21).
- Grade I Consultants (registered for 2020/21).

- Prime construction project owners: Ethiopian Authority (ERA); Addis Ababa City Road Authority (AACRA); Public Procurement Agency (PPA): Ethiopian Housing Agency; and the Ethiopian Railway Enterprise.
- Construction regulatory body: Ministry of Urban Development and Construction (MoUDC)-Construction Works Regulatory Authority.
- Government Capacity Building Bodies: Ethiopian Construction Project Management Institute (ECPMI).

The list and addresses of the Grade I contractors and Grade I consultants was obtained from the Ministry of Urban Development and Construction (MoUDC). Then, the major government project owners and regulatory bodies were added and summarised, as shown in Table 4.1.

Table 4.1 Summary of registered Grade I Contractors and other ECI stakeholders

Category	Registered for 2020/21
I. Grade I Contractors	
Building Contractors	152
General Contractors	104
Road Contractors	10
Specialized Contractors	10
II. Grade I Consultants	35
III. Government Prime Project Owners	5
IV. Government Regulatory Body	1
V. Government Capacity Building Institute	1
Total	**318**

Source: MoUDC (2021)

III. Sampling method

A sample may be selected from a population through different sampling methods. This research used a stratified simple random sampling method. According to Saunders, Lewis & Thornhill (2009:228), stratified random sampling is a modification of random

sampling in which the researcher divides the whole population into two or more relevant and significant strata based on one or several attributes. The sampling frame would then be divided into many subsets. A random sample can be drawn from each stratum (Saunders, Lewis & Thornhill, 2009:228). A stratum of Grade I contractors, Class I consultants, Prime project owners, Construction regulatory body, and Construction capacity building institute was initially formed, as shown in Table 4.1. The total sample size and sample size for each stratum was then determined, as shown in Table 4.2. Then a simple random sampling from these strata was made were names of the population entities given sequential numbers and then selected by using a random number generator.

A representative from each selected organisation was selected from top-level managers since they were expected to know about the strategy, organisational design, and project management practices of the organisations they manage.

IV. Sample Size

The total number of Grade I contractors and Grade I consultants (with valid registration for 2020/21), Prime project owners, the Construction regulatory body, and the Capacity Building Institute was 318. Therefore, this number of people served as the target population.

To determine the optimum sample size, the simplified formula of Yamane (1967:886) was used. The sample size was calculated using the simplified formulae for a 95% confidence level with p=0.5.

$$n = \frac{N}{(1 + N(e)^2)}$$

For N (Target population size) =318 and e (Margin of error) =0.05, n (sample size) =178, then considering an 80% responsiveness, 223 would be the corrected sample size. Proportionally distributed, the sample size included 107 Grade I Building contractors, 73 Grade I General Contractors, 7 Grade I Road Contractors, 7 Grade I Specialised Contractors, 24 Grade I Consultants, 3 Prime Government project owners, 1 Construction regulatory body, 1 Capacity building Institute as shown in Table 4.2.

Table 4.2 Sample size for the quantitative study

Category	Registered for 2020/21	Sample size
Grade I Contractors		
Building Contractors	152	107
General Contractors	104	73
Road Contractors	10	7
Specialised Contractors	10	7
Government Prime Project Owners	5	3
Grade I Consultants	35	24
Government Regulatory Body	1	1
Government Capacity Building institute	1	1
Total	**318**	**223**

4.6.2 Design of Measuring Instruments

This section describes the design of measuring instruments, how they were structured, and how their flow is maintained. Interviews are more suitable for questions that require probing to obtain adequate information. The use of interviews to question samples of people is a very flexible tool with a wide range of applications (Walliman, 2011:99). The most common types of interviews are unstructured, semi-structured, and structured interviews (Dawson, 2007:28). The initial data for this study were generated through a semi-structured interview to solicit valuable information regarding the study subject from persons who had deep experience and knowledge of the ECI.

A semi-structured interview is the most common type of interview used in qualitative research. In such types of interviews, a researcher wants to know specific information which can be compared and contrasted with information gained in other interviews. Similar questions need to be asked in each interview. A researcher needs to produce an interview schedule or guide, a list of specific typically open questions, or a list of topics to be discussed (Dawson, 2007:28).

(a) Interview Guide

An interview guide was developed from the literature review and was tested at a pilot level (Appendix III). Pilot studies are important to identify potential problems with the study (Creswell & Poth, 2018:223). The research questions and propositions stated in Chapter 1, Section 1.4 were linked to the interview questions regarding what they sought to investigate, as revealed in Table 4.3. Interview questions were provided to each participant before the interviews to enable each participant to be well prepared. The Interviews lasted between seventy to ninety minutes and were conducted face-to-face and via Zoom meetings. Zoom meetings were preferred to safeguard the participants from the Covid-19 pandemic. Permission to record each interview was requested from the participants.

(b) Questionnaire

The literature review and the findings of the semi-structured interviews were inputs for preparing a comprehensive questionnaire to ensure that all the significant themes are covered. Question format and questionnaire design could influence the results obtained (Neuman, 2014:337). Czaja & Blair (2005:2) explained a survey questionnaire as the conduit through which information flows from the world of everyday behaviour and opinions into the world of research and analysis. It is a link to the phenomena planned to be studied. Sekaran (2003:236) explained a questionnaire as a pre-formulated written set of questions to which respondents record their answers, usually within closely defined alternatives. Sekaran (2003:236) stressed that questionnaires are efficient data collection mechanisms if the researcher knows what is exactly required and how to measure the variables of interest.

The questionnaire length depends on the respondent's characteristics and the survey format. The sequence of questions in a questionnaire involves the organisation of the comprehensive questionnaire, question order effects, and context effects. Regarding the organisation of the overall questionnaire, it is better to sequence questions to minimise respondent confusion and discomfort. A questionnaire has opening, middle, and ending questions. After an introduction explaining the reasons for the interview, it is

best to make opening questions pleasant, interesting, and easy to answer. It helps the respondents to feel comfortable about the questions. Organising questions in sections and giving an introductory statement for each section is preferred. The questionnaire should not end with sensitive questions and incorporate a “thank you” (Neuman, 2014:338).

The sequence of questions in a questionnaire can influence respondent answers (Neuman, 2014:338). Sekaran (2003:242) suggested a funnel questionnaire design approach as progress from general to specific questions in which the respondent is first asked questions of a general nature related to the organisation and then more insightful questions regarding the specific department, job, and other issues (Sekaran, 2003:242).

The questionnaire for this study (Appendix IV) included questions and statements that adequately addressed the main and sub-research objectives. Consideration was given to the fact that respondents might be worn-out with a questionnaire when asking too many questions. Therefore, only relevant questions were included that were perceived to contribute valuably to developing a conceptual model for the organisational design of PBOs. The questionnaire was developed from the information gathered from the literature review. In addition, the interview findings were used to enrich the questions developed from the literature. At the beginning of the questionnaire, the rationale of the research was explained. The main body of the questionnaire contained the following sections:

- Section A: Background of the respondents
- Section B: Salient characteristics of full-fledged Project-based organisations
- Section C: Organisational design dimensions of full-fledged PBOs
- Section D: Antecedents of organisational design dimensions of full-fledged PBOs

Table 4.3 shows how the research instruments were designed to respond to the research questions. The interview guide and research questionnaire are included as Appendices III and IV, respectively.

Table 4.3 Research instrument Design

Research Question	Interview Questions	Questionnaire Questions	Details/focus
Categorisation/Classification questions	Section A- Question A1	Section A Questions 1-6	This section provides the background of respondents to explain some possible response trends
What are the key dimensions of the organisational design of Ethiopian construction firms?	Section B- Questions 3-10	Section C- Part I-V	These questions seek to identify the organisational design dimensions of construction firms in the ECI
What are the antecedents of organisational design dimensions of Ethiopian construction firms?	Section B- Questions 11-15	Section D- Questions 1-10	Different antecedents influence organisational design dimensions. These questions seek to identify antecedents influencing the different organisational design dimensions of construction firms in the ECI
What should the conceptual model for transforming Ethiopian construction firms into full-fledged Project-based organisations be?	Section B- Questions 1-16	Sections B, C, and D	The relationship between antecedents of organisational design dimensions, organisational design dimensions, and salient characteristics of full-fledged Project-based organisations could be studied here.

4.6.3 Data Collection and Analysis

(a) Qualitative data collection and analysis

The research questions of this study were to identify the organisational design dimensions and their antecedents that could help Ethiopian construction firms to transform into full-fledged PBOs. Therefore, a qualitative study was appropriate for resolving the "what" research questions (Creswell & Creswell, 2018:179). Data for qualitative studies could be gathered from different sources, including documents, archival records, interviews, and so forth. In addition, semi-structured interviews were conducted with six top-level managers, including Grade I contractors and six top-level managers of other stakeholders of ECI who had sufficient knowledge of ECFs and ECI.

The literature review was taken as a source to formulate the interview questions. Many forms of interview bias are caused by an interviewer and the respondent while gathering data. Neuman (2014:355) discussed six categories of interview bias:

> *"Errors of the respondent include forgetting, embarrassment, misunderstanding, or lying because of the presence of others ; Unintentional errors or interviewer sloppiness ; contacting the wrong respondent, misreading a question, omitting questions, reading questions in the wrong order, recording the wrong answer to a question, or misunderstanding the respondent; Intentional subversion by the interviewer. Purposeful alteration of answers, omission or rewording of questions, or choice of an alternative respondent; Influence due to the interviewer's expectations about a respondent's answers based on the respondent's appearance, living situation, or other answers; Failure of an interviewer to probe or to probe properly; Influence on the answers due to the interviewer's appearance, tone, attitude, reactions to answers, or comments made outside the interview schedule."*

For the qualitative data, a thematic content analysis (classifying the interviews into various themes) was used to analyse the interview results. After the data collection process, all interviews were transcribed for analysis. Neuman (2014:355) explained a

content analysis study as gathering and analysing the content of the text. The content can be meanings, words, symbols, pictures, ideas, themes, or any communicated message.

(b) Quantitative data collection and analysis

A preliminary questionnaire was prepared from the literature review, which was then refined by the findings of the qualitative study. The research topic had to be studied within a larger sample size to address the research questions. Therefore, it required a quantitative study approach. Questionnaires are particularly suitable for gathering quantitative data. This method of data collection is usually called a survey. There are three methods of delivering questionnaires, personally, by post, or through the Internet. Emails were preferred to deliver the questionnaires in this era of the Covid-19 pandemic. Reminder emails were sent to improve the commonly expected lower response rate using the internet for a survey as a data collection method (Walliman, 2011:97).

There are two common types of quantitative data analysis: descriptive and inferential. Scherbaum and Shockley (2015:3) explained descriptive and inferential analysis as follows:

> *"The goal of descriptive quantitative analyses, as the name implies, is to quantitatively describe or summarize data. These quantitative analyses only attempt to describe a particular aspect of a set of data (e.g. an average of the set of data, variability in the data). The goal of inferential quantitative analyses is to evaluate the viability of inferences about the generalizability of the relationships, associations or differences observed in the sample in regard to the population. Inferential quantitative analyses are the primary analytical tools that are used to evaluate research questions and hypotheses."*

The data collected from the survey were cleaned, edited, and coded. After entering and coding the data using Excel, the data were exported to computer-aided data analysis

software, the latest SPSS 27 program version. Descriptive statistics such as mean, median, standard deviation, frequency, and percentages were calculated to describe the data. The Pearson correlation and One-way ANOVA tests were done to prove/disprove the research propositions formulated in Chapter 1, Section 1.4. The findings will be presented as tables and histograms in Chapter 5.

4.7 Quality and Rigour in the Qualitative Research

Quality or rigour has become an important concept in qualitative research as it allows researchers to describe the virtues of qualitative terms outside the parameters typically applied in quantitative research. The quality criteria for qualitative research are transferability, dependability, credibility, and conformability (Connelly, 2016:435; Korstjens & Moser, 2018:120).

4.7.1 Transferability

Transferability is the degree to which the results of qualitative research can be transferred to other contexts or settings with other respondents (Lincoln & Guba, 1985; Connelly, 2016:435; Korstjens & Moser, 2018:121). The qualitative data of this study is related to a specific population (stakeholders of the Ethiopian construction industry). While it may be transferable within this specific group, results can also be transferable to construction firms in other emerging economies.

4.7.2 Credibility

A credible study is one where the researchers have richly and accurately described the phenomenon in question. Here, instead of ensuring that one has measured what one set out to measure, one makes sure they accurately represent the data. This concept is analogous to internal validity in quantitative research (Korstjens & Moser, 2018:121). Carefully designed interview guides and questionnaires were used to collect the data.

4.7.3 Dependability

Dependability is the stability of findings over time. It involves participants' assessment of the findings, interpretation, and recommendations of the study such that all are supported by the data collected from the research participants (Korstjens & Moser,

2018:121). Data were securely collected from participants and then analysed using the commonly utilised thematic content analysis.

4.7.4 Conformability

Conformability is concerned with establishing that the data and interpretations of the findings are not fabrications of the inquirer's imagination but derived from the data (Korstjens & Moser, 2018:121). The research results were compared with other related prior studies to ensure conformability.

4.8 Reliability and Validity in the Quantitative Research

It is essential to consider the validity and reliability of the data collection tools when conducting quantitative research (Dawson, 2002:110; Heale & Twycross, 2015:66). Creswell (2014:200) also stressed the value of reliability and validity scores on instruments for a meaningful interpretation of data. Reliability and validity were explained by Heale & Twycross (2015:66) with an illustrative example. If an alarm clock rings at 7:00 each morning but is set for 6:30, it is very reliable (it consistently rings at the same time each day) but is not valid (it is not ringing at the desired time) (Heale & Twycross, 2015:66).

4.8.1 Reliability

Reliability refers to the extent to which data collection techniques or analysis procedures yield consistent findings (Marczyk, Dematteo & Festinger, 2005:10). Reliability differs from validity in that it does not relate to what should be measured but instead to how it is measured (Hair *et al.*, 2014:91). Reliability can be assessed by posing the following three issues: the same result by the measures if done on other occasions; similar observations need to be reached by other observers; transparency in how sense was made from the raw data (Saunders, Lewis & Thornhill, 2009:156; Fellows & Liu, 2008:85). The reliability of the data was examined to check the internal consistency of the variables included in the research instrument. There are different approaches for calculating internal consistency, of which one of the most frequently used is Cronbach's alpha (Saunders, Lewis & Thornhill, 2009:374; Heale & Twycross, 2015:66).

The agreed lower limit for Cronbach's alpha is 0.70 to show an internal consistency of a research instrument (Hair *et al.*, 2014:123). The instrument was initially distributed to 30 respondents to test its reliability, and Cronbach's alpha for the different sections was above 0.70, showing an internal consistency.

4.8.2 Validity

Validity is the degree to which a measure accurately represents what it is supposed to (Hair *et al*., 2014:7). Heale & Twycross (2015:66) categorised validity into three major categories and explained them as:

> *"The first category is content validity. This category looks at whether the instrument adequately covers all the content that it should with respect to the variable. In other words, does the instrument cover the entire domain related to the variable, or construct it was designed to measure? A subset of content validity is face validity, where experts are asked their opinion about whether an instrument measures the concept intended. Construct validity refers to whether you can draw inferences about test scores related to the concept being studied. In other words, the extent to which a research instrument (or tool) measures the intended construct. The final measure of validity is criterion validity. It is the extent to which a research instrument is related to other instruments that measure the same variables. Correlations can be conducted to determine the extent to which the different instruments measure the same variable."*

The study variables were well covered in the literature review and interviews to ensure the content validity of the questionnaire. Also, the face validity of the data collection tools for this study was checked at a pilot stage by experts in project management and organisational studies, and their comments were then incorporated. Three associate Professors and one assistant Professor of Construction Management from AAU have provided their comments and recommendations.

4.9 Ethical Issues

Ethical principles in business research, and perhaps more specifically transgressions of them, tend to revolve around certain issues that recur in different guises. According to Alan & Emma (2015:129), these basic concepts have been then divided into four main parts: possible harm to participants; if informed consent is absent; if there is an invasion of privacy, and whether deception is involved.

The researcher made an effort to ensure all individuals participated in the study of their free will. The participants were not pressured in any form. Moreover, they were informed that they could withdraw from the study at any time during the research period. All the information obtained from participants was maintained confidential. All data were treated anonymously, and all personal information was coded. The individuals' and organisations' identities will be kept confidential at all stages of the research and after. The documents studied included company manuals, policies, procedures, organisational structures, strategic plans, and other data from participant organisations and were kept secret. Before any engagement in data collection, a go-ahead permit from UNISA's Ethical clearance permission (Appendix I) was granted.

The Covid-19 pandemic required collecting quantitative data with the support of Information communication technology (ICT). Some of the interviews were conducted virtually using the Zoom platform. This was not difficult since the respondents were top management individuals with access to the Internet. In cases where face-to-face meetings were necessary, precautions and measures recommended by the World Health Organisation (WHO) and FDRE-Ministry of Health were implemented to safeguard the interviewees and the interviewer from the Covid-19 pandemic.

4.10 Chapter Summary

This chapter covered the methodological choice of the research. The pragmatist philosophical stance of the study gave birth to a mixed-method research design. The study included an exploratory sequential mixed research method best fit to meet the research objectives. A sequential research approach collected data through qualitative and quantitative research methods (QUAL-quant). Purposive sampling was the preferred method for the qualitative study (interviews) to incorporate the views of top-level managers with sufficient knowledge and experience of ECFs and ECI. Interviews were conducted with 12 top-level managers selected from different organisations in the ECI. Stratified random sampling was the preferred sampling method for the quantitative study. Qualitative data analysis was performed by applying thematic content analysis.

The survey questionnaire was initially developed from the literature review and then enriched with findings from the qualitative study. The quantitative data analyses included descriptive statistics, One-way ANOVA, and Correlational analysis. The qualitative study's transferability, credibility, dependability, and conformability were carefully considered. The validity and reliability of the quantitative study were also confirmed. The critical issue of ensuring Covid-19 protocols was given due attention in the data collection process.

CHAPTER 5: RESEARCH RESULTS

5.1 Introduction

The main objective of this study is to develop a conceptual model that would help Ethiopian construction firms trapped within different problems to be transformed into full-fledged Project-based organisations (PBOs). The extensive literature review on the theory and practices of organisational design PBOs in Chapter 3 enabled the identification of salient PBO characteristics. A QUAL-quant sequential research design was preferred in Chapter 4 as it seemed the appropriate research approach to collect data for addressing the study's research questions.

This chapter presents the results obtained from the qualitative and quantitative analysis of the collected data. It starts with a discussion of the semi-structured interview results. Then, an analysis of the data collected from one hundred and eighty participants representing the different stakeholders of the Ethiopian Construction Industry (ECI) would follow. The reliability tests done for the instrument selection are also covered in this chapter, and the performed normality test results are incorporated. Then the One-way ANOVA and Pearson correlation test results are discussed. The final section of the chapter focuses on the summary of the research findings.

5.2 Interview Results

A primary qualitative study followed by a quantitative survey was the preferred research strategy described in sections 4.5 and 4.6 of Chapter 4. This section summarises the responses to the semi-structured interviews conducted with well-experienced individuals in the ECI. The interviews focused on the organisational design of Ethiopian construction firms (ECFs). The interviews reached a data saturation point after the tenth interview, but the interviewer continued up to the 12th interview.

5.2.1 Profile of Respondents

The interviewees were selected for their in-depth knowledge of the ECI, specifically about Grade I construction firms, and had more than ten years of experience in the ECI. The positions of the interviewees are shown in Table 5.1.

Table 5.1 Profile of Respondents

Interviewee Position	Number
Chief Executive officer/Managing Director/General Manager	8
Deputy Director/Deputy General Manager/	2
Engineering Director	1
Planning and Monitoring Director	1
Total	12

5.2.2 Results of the semi-structured interviews

With consent from the interview candidates for their participation in the interviews, the seven interviews were conducted in person at the respondents' offices and the other five virtually on a Zoom platform. The interviewer appeared at the face-to-face interviews formally with a coat. To ensure punctuality, the interviewer arrived 30 minutes before the meetings.

At the beginning of the interviews, the interviewer thanked the participants for their willingness to participate in the research. The interviewer then explained the purpose of the study and its progress. The participants were informed of their right not to answer interview questions and that they could discontinue the interview at any point. In all the interviews, the interviewees were asked for their permission to record the interviews. The interviews lasted between 70 to 90 minutes. At the closing of each interview, the interviewer thanked the interviewees for committing their time to the research.

The interviews proved valuable to the research by bringing six additional antecedents besides confirming the ten antecedents identified by the Modified Star Model, the theoretical model for this study. The six antecedents listed below emerged from the summary and transcripts of the conducted interviews:

(a) Awareness and knowledge of project management: The interview participants emphasised a noticeable gap in awareness and knowledge of project management at Grade I construction firms. They stressed that this gap is prevalent at the project and organisational levels. Furthermore, they underlined that some members of organisations did not even understand the fundamentals of projects.

(b) Project core teams: The participants emphasised that the existing bureaucratic setup at projects is not conducive for performing project tasks. The participants claimed that only informal groups are prevalent in projects. Properly designed formal project core teams are not available at projects.

(c) Strategic project management information system: The interviewees underlined the lack of smooth flow of information among stakeholders of projects. It resulted from not understanding the interest of the project owners. The participants also highlighted

inefficient trends in performing project work due to the absence of digital platforms for properly designed communication internally and with other project stakeholders.

(d) Dynamic capability and organisational learning: The participants underlined that currently, ECFs are working in an environment that is continually changing. The methods and approaches used for their projects are becoming obsolete fast. ECFs find it challenging to cope with turbulence and do not have the flexibility and the learning mechanisms to adjust accordingly.

(e) Upper management support: The interview participants stressed that the upper managers give due attention to projects and project members only at the beginning of a project. There is no continuous communication between the upper management and projects. The upper managers typically do not provide feedback through project performance reports.

(f) Competency of Project managers: The interview participants emphasised that project members with good technical capability and communication skills are usually assigned project managers without sufficient knowledge of project management and other required skills.

All the transcripts could not be included in the discussion of the interviews. Therefore, only a few examples of the extracts will be presented next. The full interview transcripts are shown in Appendix V.

I. Awareness and knowledge of project management

'Awareness and knowledge of project management' is an important antecedent that emerged from the interviews. Extracts from the interview transcripts concerning awareness and knowledge of project management are provided below. All quotations are reproduced verbatim and unedited.

Interviewee [1]

> *"The common thinking is that the head office should just provide resources and the duty of a project is to make use of these resources to perform tasks. The standard project management processes that link organisations with their projects and within projects are not known. Organisations only give due attention to procurement, logistics, and finance-related processes. Project management knowledge is considered an extra thing. Everyone is much concerned about technical knowledge. I think the reason why project management is not valued much is due to lack of awareness and knowledge of project management at the different levels including the upper management, project managers, and project members."*

Interviewee [2]

> *" In my opinion, I don't think a shortage of resources including finance, is not the reason. Even if there is such a problem it could be solved. The major problem is the absence of clear processes to execute works as an institution both at the parent organisation and project levels. This is happening even in the presence of a proper organisational structure. Even the top managers do not have proper knowledge of project management processes. This problem is not limited to the construction industry but also existent in other industries working with projects."*

Interviewee [9]

> *"Firms only give due attention only to internal processes related to project material purchases, mainly the procurement and logistics parts. Regarding the whole knowledge area and processes of project management, we have a noticeable gap starting from the top management to project levels."*

Interviewee [12]

> *"We have nationally studied the construction project management maturity level of Grade 1 to 3 contractors and consultants. Sadly their level ranges between 1 & 2 out of 5. Level 1 company is uninformed about the processes and practice. Level 2 organisations are project-centric but not standardized and depend on the individual performance of project managers. Yes, there are very few firms that reached level 3. But most of the contractors are at the uninformed process level."*

From the discussions, it is evident that awareness and knowledge of project management are key antecedents of organisational design dimensions necessary for ECFs and that it had to be included in the Conceptual Model (CM) after being validated by the quantitative study.

II. Project core teams

'Project core team' is an important antecedent that frequently emerged in the interviews. Below are the extracts from the interview transcripts regarding project core teams. All quotations are reproduced verbatim and unedited.

Interviewee [2]

> *"…The project manager himself tries to form a committee for his project. But this committee/group is not formal and not recognized by the upper management. The group doesn't work regularly and conducts continuous meetings. There is no trend to establish a formal project team by the upper management at the start of projects. Everyone is running to meet his target at any cost. That's why everyone*

is blaming each other at progress meetings. Resolving such fights is a usual task of project managers. Every project member communicates with the corresponding functional superiors at the head office. There is no formal core team at projects that could decide on project issues."

Interviewee [5]

"Project members mostly communicate only with their project managers and their head office superiors. There is no much-recognized formal team at projects with a clear linkage and communication procedures. Due to the absence of such teams, projects are not performing as expected. For instance, a construction engineer might be encountered with a variation work but due to the absence of teamwork, the contract engineer might not get this information and missed it in payment preparation phase…"

The interviews showed that a Project core team is a key antecedent of organisational design dimensions necessary for ECFs. Therefore, after being validated by the quantitative study, it has to be included in the CM.

III. Strategic project management information system

A 'Strategic project management information system' seemed important in the interviews. Below are the extracts from the interview transcripts regarding a strategic project management information system. All quotations are reproduced verbatim and unedited.

Interviewee [4]

"Currently, we use email and social media groups like Telegram. But we do not have a website or a digital platform to communicate with our project members and the other project stakeholders. Due to this, we are facing big problems in preparing time and cost claims. We have lost a lot due to missed letters and inspection certificates. We have failed to properly document our correspondences, inspection certificates, and other useful documents. I think this should be seriously considered by the top management in the future."

Interviewee [10]

> *"... The experience and knowledge acquired from other projects are not well kept in the organisations. This is becoming a more serious problem due to the current high turnover of employees. A new project in a new environment without experienced company staff is a common challenge. In my opinion, this can only be addressed by retaining knowledge at projects through designing proper processes and documentation systems. The problem is the upper management considers the implementation of information systems too expensive. But the construction firms are missing a lot due to the absence of a digitalized documentation system.* There is no proper database on material, labor, and other resource prices: failing in bids. *Best practices and lessons from previous errors at projects are not digitally documented for learning purposes."*

Findings from the interviews indicated that a strategic project management information system is a key antecedent of organisational design dimensions necessary for ECFs. Therefore, after validation by the quantitative study, it has to be included in the CM.

IV. Dynamic capability and organisational learning

'Dynamic capability and organisational learning' is an important antecedent from the interviews. Listed below are extracts from the interview transcripts regarding dynamic capability and organisational learning. All quotations are reproduced verbatim and unedited.

Interviewee [6]

> *"The first thing the local firms should do is be ready for change, to design and implement scientific ways of running a construction company. It should start with having a vision and mission. Then a strong commitment is required to design and implement the concepts you raised like strategy, structure, and others. The current one-man company attitude should stop at any cost if the local firms want to be competitive. The government should also value construction firms who are*

trying their best to establish a proper company that will benefit the nation. The thing you should not forget is if the government fully opens the market to the world, international firms who are efficient and effective will surely come to the market. Those firms have a minimal loss due to mismanagement. Therefore, continuous internal change is a must to do to stay in the business. The firms are not also flexible to adapt themselves to any external unexpected changes in projects. ”

Interviewee [10]

“Each company needs to carefully perform a diagnosis of its own company based on the benchmarks mentioned at the start of our discussion. Then they need to make themselves ready for a transformation. It should start from the top management. They should stop being change-resistant.”

Interviewee [11]

“There should be a fundamental change and the change needs full commitment by the company owners. They should be ready to transform their company into a big institution. The upcoming expected entrance of international giant construction firms would even make the industry very competitive. Now "Survival of the fittest" issue is at the front door. Also, project owners are increasingly becoming too demanding in their projects. For this, the contractors should be ready to be flexible for any unexpected changes and also design a system to learn from the previous project works”

After the interviews, it became evident that dynamic capability and organisational learning is a key antecedent of organisational design dimensions necessary for ECFs and has to be included in the CM after being validated by the quantitative study.

V. Upper management support

'Upper management support' is an important antecedent identified from the coded interview data. Here below are the extracts from the interview transcripts regarding upper management support. All quotations are reproduced verbatim and unedited.

Interviewee [1]

> *"The upper management and projects mostly communicate through progress reports. The true reason for report preparation is an obligation by external parties including project owners and consultants. This can be noticed as there is no trend of giving feedback for the reports by upper managers. The upper managers do not provide support to projects by providing a systemic solution to repeated project problems. Informal communication is common in most construction firms. But this informal communication especially with company owners is creating chaos at projects and the head office."*

Interviewee [3]

> *"In my experience, the construction firms usually give support to projects at the beginning of a project and when the client calls for a meeting. Usually, after 2 or 3 months from the commencement date, the project manager would start to lose support. Then the project manager and the other project team members would then start to beg for support."*

Upper management support frequently emerged from the interview data as a key antecedent of organisational design dimensions necessary for ECFs. Therefore, if confirmed by the findings from the quantitative survey, it should be included in the CM**.**

VI. Competency of Project managers

'Competency of project managers' was an important antecedent that frequently emerged from the interviews. The extracts from the interview transcripts regarding the competency of project managers are listed below. All quotations are reproduced verbatim and unedited.

Interviewee [7]

> *"…The project managers that are accidentally appointed need to be trained in project management and other areas to be to be ethical and capable managers."*

Interviewee [8]

> *"There is no such big problem in designing the structure. The basic functions are there. They mostly use matrix structure. The question is if they are abiding by the structure or not. I don't think so. For example, if there is a box for a project manager in the structure and if the company owner or Engineer always bypasses and gives orders to the project team members, having the structure is meaningless. Symbolic project managers are placed as per the structure, but usually, their superiors are doing their jobs. The funny part is the upper managers don't trust and abide by the structure they designed. They say this is due to their lack of confidence in the capacity of their project managers."*

Interviewee [9]

> *"The local construction firms are not currently competitive in the market. This is noticed in their performance on different projects. Our poor organisational setup, lack of proper financial management, absence of qualified manpower; traditional work methodologies, and poor work culture are the major reasons for this in my opinion. There is also a major shortage of skilled project managers who can manage mega-size projects. Some project managers are very good at the technical part but miss a leadership quality. Most project managers do not have the expected project management and leadership skill and knowledge to manage their projects. The government also seems to lose its trust in the local contractors and their project managers and giving projects to the Chinese and other Asian contractors. This is a very sad story."*

From the interview contributions, it is evident that the competency of project managers is a crucial antecedent of organisational design dimensions necessary for ECFs. Therefore, after validation by the quantitative study, it has to be included in the CM.

Furthermore, the interviews confirmed the ten antecedents necessary for the organisational design dimensions of ECFs as previously identified in the literature review (see Appendix V for the full interview transcripts). The ten transcripts referring to the ten antecedents emerging from the interviews are listed below.

I. Project orientation

'Project orientation' is an important antecedent found in the literature review and confirmed in the interviews. Listed below are extracts from the interview transcripts regarding project orientation. All quotations are reproduced verbatim and unedited.

Interviewee [5]

> *"They have a strategic plan but not a realistic one. For example, I used to work in a construction company where its strategic document was prepared by a group of renowned Professors and Ph.D. holders. But project members are not much involved. Projects are not seriously considered in the strategic document preparation. This seemingly "picture perfect" document faced a serious challenge at the implementation phase since the staff and project members didn't internalize it from the start and projects were not given the expected priority in it."*

Interviewee [10]

> *"…We don't consult our strategic plan at the execution phase. We should start to give value to the strategy before starting the preparation. We love to jump to routine work. Regarding its linkage with projects, they consider projects as a simple tool to an end. They don't incorporate them in their strategy seriously as a company working with projects."*

Interviewee [12]

> *"…the head office staffs do not keep in mind the true value of projects when they do their routines. They don't also choose projects based on their strategic value to the organisation."*

II. Project-based working

'Project-based working' is an important antecedent found in the literature review and confirmed in the interviews. The following extracts from the interview transcripts regarding Project-based working are listed below. All quotations are reproduced verbatim and unedited.

Interviewee [3]

> *"... As I told you at the beginning, I have worked with an international company abroad. The international construction companies consider standard project management processes in every project activity from the project commencement to completion. The local construction companies in Ethiopia consider a few of those processes at the beginning of their projects. But in time the verbal communication will take over neglecting everything, especially in privately owned projects."*

Interviewee [12]

> *"The contractors do not have the clarity to work with which organisational structure, functional, matrix, or project-focused. They are mostly using a weak functional structure. The tasks to be performed at the head office and projects are not differentiated. Most of the decisions regarding the project works are performed at the head office level. Sometimes project managers are not even able to decide on small purchases. But the nature of projects has a sense of urgency and requires spot decisions. The project manager is not fully autonomous. We could surely say the local constructions do not have the trend to give the mandate to projects. I have seen some companies with very good structure and process documents, but not implementing them on the ground.*

III. Fit

'Fit' is an important antecedent found in the literature review and confirmed in the interviews. Here below are the extracts from the interview transcripts regarding Fit. All quotations are reproduced verbatim and unedited.

Interviewee [2]

> *"It should start from the mind-set of the company owners and top-level managers. They should first know the true value of having a strategic plan and the other dimensions you mentioned. If they have a long-term vision and mission, strategy and the others could be prepared subsequently. A company that wants to stay long in the construction industry could not neglect projects as they are the ones bringing the cash inflow. The strategies should be prepared including project team members. The organisational structure could then be prepared, and aligned with the strategy. Regarding the processes, they should be included in the preparation of the strategic plan. Process mapping needs to be done while preparing any strategic document and when it comes to construction companies, project-based companies need to include the PMI processes and knowledge areas. All these steps should be aligned but missed in our construction industry"*

Interviewee [5]

> *"We have a strong matrix structure. Every head office department has its representative on projects. After a strategic document is prepared, some try to prepare an organisational structure that considers the strategy. Similar to strategy, the problem is faced in the project implementation phase. We don't have the mechanism and culture to sit and design project processes that line up with the strategy before commencing the project. We just become submerged into the routines of project works."*

IV. Project culture

'Project culture' is an important antecedent found in the literature review and confirmed by the interviews. Below are extracts from the interview transcripts regarding Project culture. All quotations are reproduced verbatim and unedited.

Interviewee [10]

> *"Projects are time-bounded, have a start and an end. The project staff needs to adjust themselves to this trend. But they do not seem to adapt easily to these repeated changes. There is a high turnover of project staff due to this reason. The experience and knowledge acquired from other projects are not kept in the organisation due to the prevalent high turnover of employees. A new project in a new environment without experienced company staff is a common challenge. In my opinion, this can only be addressed by retaining knowledge at projects through designing proper process and documentation system*."

Interviewee [11]

> *"As for me, some previous Ethiopian construction companies had their own identity. For example, Company X is known for quality and Company Y for doing massive construction works. They had their own project culture. But there is no single recent company I know with an identifiable identity in their projects works. I think the struggle to acquire projects has made the contractors busy with external issues. The other problem is the registration problem. Unprofessional people have invaded the construction industry which doesn't give much attention to system development. That is why the government is currently revisiting its registration protocol."*

V. Churn

'Churn' is an important antecedent found in the literature review and confirmed by the interviews. Below are the extracts from the interview transcripts regarding Churn. All quotations are reproduced verbatim and unedited.

Interviewee [1]

> *"Most of the project works are subcontracted. The human resource management for the company staff is not taken seriously. Skilled and unskilled employees continuously come and leave the organisations and their projects. In my opinion, the organisations should think out of the box and design a motivational scheme*

and incentives for all their staff according to their performance. Also, staffs leaving their stable houses for project works need to be compensated."

Interviewee [11]

"There is a saying "any employee in the Ethiopian construction industry has always his bag on his back", being ready to leave the company at any time. There is a huge turnover of professionals. If you come to some company after three years, you would most likely find completely new staff. The way the human resource at projects is being handled lack something."

VI. History and context of the organisation and its leadership

'History and context of the organisation, and its leadership' is an important antecedent found in the literature review and confirmed by the interviews. Below are extracts from the interview transcripts regarding the antecedent. All quotations are reproduced verbatim and unedited.

Interviewee [4]

"University level studies should incorporate ethics as a course. The students should know how positively the construction industry could contribute to national growth. Also, the leadership and culture of top managers of our companies need to be improved. I noticed this in some incidents. The same carpenters who used to work in our company become very productive immediately when they join an international company. In my opinion, the leadership quality of the international companies was the reason for the change in the work culture of the carpenters."

Interviewee [7]

"The current management approach of the local construction companies is very traditional. Primarily the companies need to clearly define their vision and mission. Then the company owners should start to empower their management and stop getting too much involved in the routines. The management and all employees including project members should get benefits as the company and project became profitable. Better make key staffs shareholders and make the company a

shareholders company than a private company. If the construction companies do so, they can even become competitive regionally and then worldwide."

VII. Size

'Size' is an important antecedent found in the literature review and confirmed in the interviews. Here below are the extracts from the interview transcripts regarding Size. All quotations are reproduced verbatim and unedited.

Interviewee [4]

"There are very few matured local construction companies who can perform well and be competitive in the smaller building projects if given the opportunity. But in mega building and road projects, we cannot compete with the international companies in our current setup. But we need to work on our management skills and new technologies for bigger projects."

Interviewee [10]

"…There are few one-man companies in Ethiopia who are relatively successful but only in smaller projects. They do the major things by themselves. They acquire only two and three projects. They do it nicely. The problem is such companies' growth is limited. Their shoulder cannot carry bigger projects."

VIII. A shareholder versus stakeholder orientation

'A shareholder versus stakeholder orientation' was another important antecedent found in the literature review and confirmed in the interviews. Below are extracts from the interview transcripts regarding 'A shareholder versus stakeholder orientation'. All quotations are reproduced verbatim and unedited.

Interviewee [6]

"…Then a strong commitment is required by the shareholders to design and implement the concepts you raised like strategy, structure, and others. Otherwise, the current dominance of stakeholders of projects would not stop. The contractors' poor performance is letting stakeholders of projects have full control of projects.

Every project of the construction companies seems to be too focused on the project owners' interests. Due to this, the construction companies seem to float without an identity. "

Interviewee [11]

"The surprising part we notice is a company established before a decade works similarly with a newly established company. This shows that the project management capacity of the construction companies is not improving at all. Also the previous Grade I companies are becoming extinct and new ones are emerging. Due to this fear of a possible failure of their contractors, the project owners have the upper hand. Sometimes, they interfere with the internal management of the contractors. This has made the shareholders of the construction firms unable to plan for long term and manage their projects in their approach."

IX. Control by behaviour or result

'Control by behaviour or result' is an important antecedent found in the literature review and confirmed by the interviews. Below are extracts from the interview transcripts regarding the antecedent. All quotations are reproduced verbatim and unedited.

Interviewee [3]

"…private-owned and other projects in Ethiopia are usually faced with a continuous change of interest by the client making it difficult to implement the construction company's strategic goals. This would force the contractor to be too focused on results, neglecting the required improvement of behaviour of project members."

Interviewee [4]

> *"Most of us are busy with our day-to-day problems like financial problems and shortage of materials on the market. We are engulfed with these problems not to think about the future. Due to this, we don't do much work on long-term issues. We expect our project managers to do anything to complete projects…"*

X. Uncertainty, dynamism and complexity

'Uncertainty, dynamism and complexity' is an important antecedent found in the literature review and frequently appeared in the interviews. Below are extracts from the interview transcripts regarding 'Uncertainty, dynamism, and complexity '. All quotations are reproduced verbatim and unedited.

Interviewee [1]

> *"…Also, don't underestimate external factors, since a construction company is not an island. Companies are working in a country where the macroeconomic condition is volatile. The regulatory framework of the construction industry is not clear and comprehensive. How could they think about long-term transformation in such conditions? The external economic factors seriously affect local construction companies but should not be an excuse for all their inefficiencies."*

Interviewee [11]

> *"…Project owners are increasingly becoming too demanding in their projects. Also, their request is changing frequently…"*

The interviews confirmed that the previously identified ten antecedents by the Modified Star Model are indeed relevant. The confirmed antecedents are project orientation; project working; fit; project culture; churn; history and context of the organisation; size; shareholder versus stakeholder orientation; control by behaviour or results; uncertainty, dynamism, and complexity.

5.3 Questionnaire Results

In sections 4.5 and 4.6 of Chapter 4, a quantitative study was recommended to include a larger sample in a survey after the qualitative study. Accordingly, a survey was performed using the designed instrument. The purpose of this section is to explain the results of the survey. The data for the analysis was obtained from participants who responded to the survey. The questionnaire from the literature review was revised, and six antecedents were identified from the interview findings. These were added to the survey questionnaire.

5.3.1 Responses

Response rate

Two hundred and twenty-three (223) questionnaires were distributed to different stakeholders of the Ethiopian construction industry as per the sample design. One hundred and eighty (180) responded with a response rate of 81%. The response rates of the different categories are shown in Table 5.2.

Table 5.2 Response rate of respondents

Category	Number of Questionnaires distributed	Number of responses	Response rate(%)
Grade I Contractors			
Building Contractors	107	87	81%
General Contractors	73	54	74%
Road Contractors	7	6	86%
Specialist Contractors	7	6	86%
Government Prime Project Owners	3	3	100%
Grade I Consultants	24	22	92%
Government Regulatory Body	1	1	100%
Government Capacity Building institute	1	1	100%
Total	**223**	**180**	**81%**

The respondents worked in different top management positions as Directors, CEOs, General Managers; Deputy General Managers; Department heads; Resident engineers, Project managers and Project engineers. They had vast experience in the ECI, as shown in Figure 5.1. About 74% of the respondents had more than 11 years of work experience in the ECI.

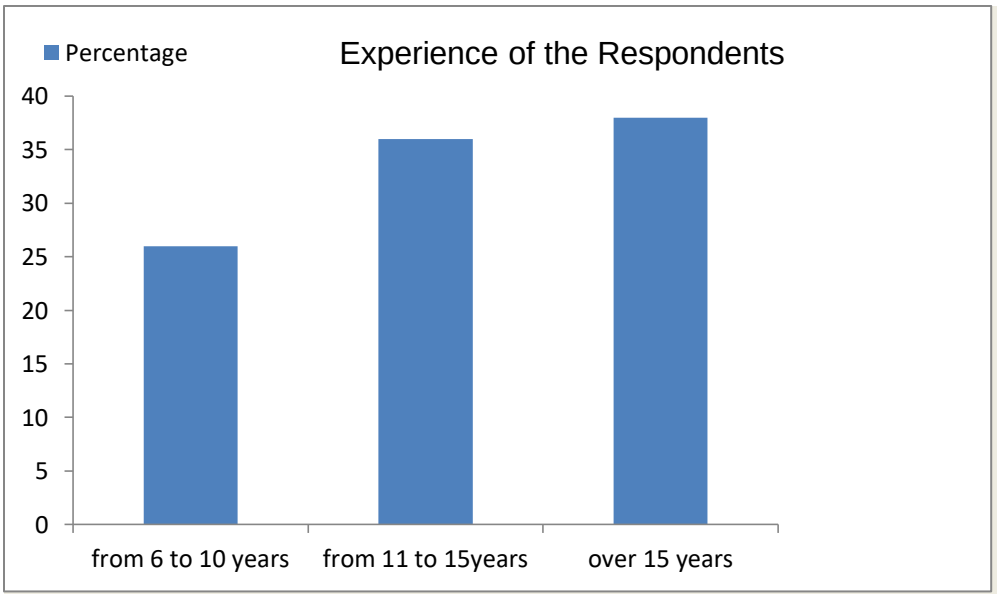

Figure 5.1 Experiences of the Respondents

The experience of the organisations in which the respondents work is illustrated in Figure 5.2. It shows a decline in number with an increase in years of experience.

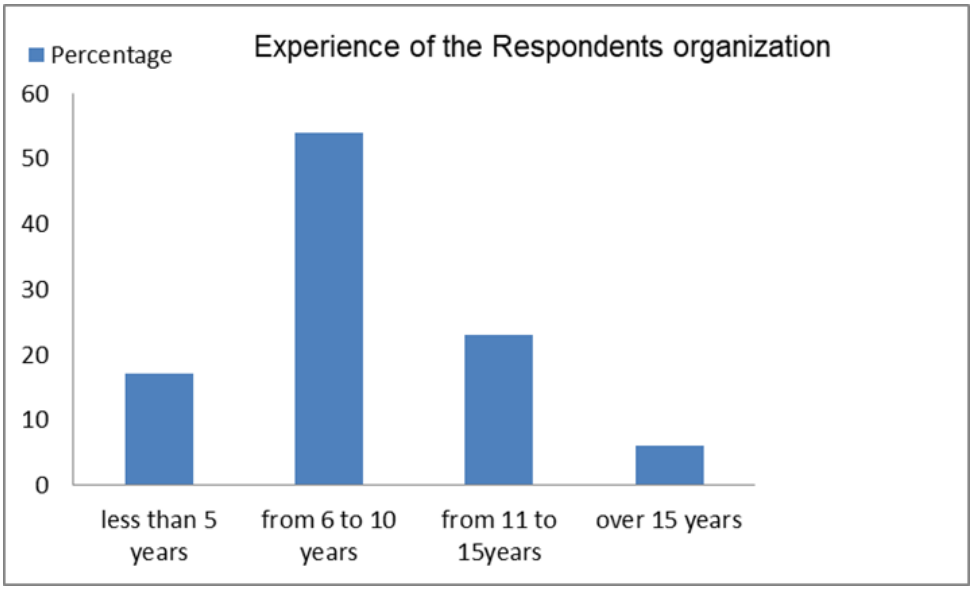

Figure 5.2 Experience of the respondents' organisations

As shown in Table 5.3, all respondents have a minimum of a first degree.

Table 5.3 Respondents' educational qualification

Qualification	Frequency	Percentage
Degree	107	59%
Masters	73	41%
Total	180	100%

The majority of the respondents, about 81%, had only taken a course on project management as part of their university study or attended a short-term course without certification, as shown in Table 5.4.

Table 5.4 Level of project management training

Level of Training	Frequency	Percentage
Masters	3	2**%**
Short-term training/with certification/	31	17**%**
Short-term training/without certification/	65	36**%**
As a course	81	45**%**
Total	180	100**%**

Likert scale responses, mean scores, medians, standard deviations and reliability test results

The Likert scale response, mean scores, medians, standard deviations, and reliability test scores of the gathered survey data are discussed below according to the different sections of the questionnaire.

Section B: Salient characteristics of full-fledged Project-based organisations (PBOs)

The Likert scale response, mean scores, standard deviations, and reliability test scores of Section B are shown in Table 5.5. The Cronbach's alpha for the salient characteristics of full-fledged PBOs is 0.812. The findings confirmed that the section was reliable, with a Cronbach's alpha above 0.7(Sekaran, 2003:311). In addition, it showed that the questionnaire contained good internal consistency in this specific section.

Table 5.5 Likert scale responses, mean scores, median, standard deviations, and reliability test scores of Section B

Section	Item	Likert Scale Responses					Mean	Median	SD	Cronbach's alpha coefficient
		SD	D	N	A	SA				
B	**Salient Characteristics of Full-fledged Project Based Organizations(PBOs)**									
	1.The organization delivers projects for its business purposes		1	10	123	46	4.189	4.00	0.547	
	2. Upper managers give value to the role of a proper project management to manage projects		58	77	38	7	2.967	3.00	0.832	
	3.The processes required to execute project tasks are well designed	5	91	67	12	5	2.561	2.00	0.778	
	4. The organization has a unit for managing projects, programs and portfolios	4	90	64	20	2	2.589	2.00	0.761	
	5. There is a clear designed system for sharing of information throughout the organization	7	87	59	24	3	2.606	2.00	0.829	0.812
	6.The organization adapts readily to changes encountered at project execution	6	76	67	29	2	2.694	3.00	0.819	
	7. Upper managers are authentic and act with integrity	2	83	59	33	3	2.733	3.00	0.830	
	8. Upper managers continously support projects	7	93	48	30	2	2.594	2.00	0.850	
	9. People in the organization embrace cross functional team work	1	80	61	38		2.756	3.00	0.788	
	10. Everyone at the organization acts together for the success of projects	5	76	61	35	3	2.750	3.00	0.858	
	11.Clear performance indicators are in place for monitoring the performance of project managers	32	82	48	17	1	2.294	2.00	0.889	

Section C: Organisational design dimension requirements for ECFs to be full-fledged PBOs

The summarised Likert scale responses' mean scores, medians, standard deviations, and reliability test scores of Section C are shown in Table 5.6. The Cronbach's alpha coefficients are calculated to determine the consistency of the research instruments in producing consistent results, measuring how closely related the set of items is as a group. The Cronbach's alpha coefficients for the questionnaire's strategy, process, structure, human resource, and behaviour sections are 0.710, 0.779, 0.710, 0.752, and 0.716, respectively, as shown in Table 5.6. Sekaran (2003:311) states that Cronbach's alpha coefficient above 0.7 is acceptable. On the other hand, the mean scores of the majority of statements regarding organisational design dimensions of ECFs required to be full-fledged PBOs are less than 3 showing an inclination to disagree with the statements.

Section D: Antecedents necessary for organisational design dimensions of ECFs

The summarized Likert scale responses mean scores, standard deviations, and reliability test scores of Section D are shown in Table 5.7. The Cronbach's alpha for the antecedents necessary for organisational design dimensions of ECFs, as shown in Table 5.7, are all above 0.704. According to Sekaran (2003:311), Cronbach's alpha coefficient above 0.7 is acceptable. On the other hand, the mean scores of the majority of statements regarding the antecedents necessary for organisational design dimensions of ECFs are below 3, showing an inclination to disagree with the statements.

Table 5.6 Likert scale responses, mean scores, median, standard deviations, and reliability test scores of Section C

Section	Item	Likert Scale Responses					Mean	Median	SD	Cronbach's alpha coefficient
		SD	D	N	A	SA				
C	**Organizational design dimensions of full-fledged PBOs,Overall reliability=0.863**									
	I. Strategy									
	1. Projects are the primary business mechanisms for coordinating and integrating all the main business functions of the organization		1	25	131	23	3.978	4.000	0.539	
	2. The organization's knowledge, capabilities and resources are built up through the execution of projects	1	56	67	53	3	3.006	3.000	0.836	
	3. Project managers within the organization hold a top management role to have direct control on business functions and resources of their projects	7	107	50	16		2.417	2.000	0.708	0.710
	4. Goals and objectives of the organization support the improvement of performance of projects	8	93	56	22	1	2.528	2.000	0.787	
	5. There is a trend in strategy preparation of the organization to integrate projects with the organization	8	105	56	11		2.389	2.000	0.672	
	6. Project management offices functions are aligned with the strategic priorities of the organization	6	96	64	13	1	2.483	2.000	0.705	
	7. There is alignment between project management office functions and project priorities	6	85	72	17		2.556	2.000	0.711	
	II. Processes									
	1.Upper managers in the organization are aware of the methods used for managing projects	15	54	58	42	11	2.889	3.000	1.051	
	2.The organization has a standard project management processes in place	17	82	49	25	7	2.572	2.000	0.975	
	3. Upper managers of the organization have been trained in project management	19	58	74	19	10	2.683	3.000	0.989	
	4.A system is best positioned in the organization to acquire knowledge about new construction technologies to be used at projects	15	82	63	15	5	2.517	2.000	0.868	
	5. There is a mechanism for testing new ideas in the organization	30	92	38	18	2	2.278	2.000	0.897	0.779
	6. Projects at the organization have a situational problem-solving capability	23	71	51	35		2.544	2.000	0.947	
	7. Project management processes are well documented and controlled in the organization	17	82	41	39	1	2.583	2.000	0.951	
	8. A strategic decision is made by the organization to use a project management information system	16	68	70	26		2.589	3.000	0.844	
	9. There is a designed process for project audits and reviews to help present and future project managers learn from past experiences	20	94	45	21		2.372	2.000	0.833	
	III. Structure									
	1.The organizational structure has created a fit between the processes adopted and the decision to be project oriented	3	66	74	36	1	2.811	3.000	0.790	
	2.There is a structure that made an alignment between processes in the organization and projects	4	66	80	30		2.756	3.000	0.752	
	3.The organizational structure has created an alignment between processes with in the different functions of the organization	2	79	77	21	1	2.667	3.000	0.717	0.710
	4.The organizational structure has created an alignment between processes in the different project level functions	2	83	60	35		2.711	3.000	0.787	
	5.There is a dedicated project management office at the organization that link the organization with projects	4	95	59	22		2.550	2.000	0.734	
	IV. Human Resource									
	1.The human resource management of the organization is supportive of projects	8	41	45	80	6	3.194	3.000	0.975	
	2.There are selected human resources management practices that are specifically adopted for projects	14	65	59	41	1	2.722	3.000	0.922	
	3.The human resource configuration of the organization could be easily reconfigured when a new project is commenced	4	56	61	53	6	3.006	3.000	0.912	
	4.There is a flexible carrier development program for project employees with consideration of the dynamic nature of projects	17	65	52	45	1	2.711	3.000	0.966	
	5. There is a motivational scheme conditioned by the complexity and intensity of projects	13	92	53	22		2.467	2.000	0.801	0.752
	6.The organization provides incentives for individual innovations at projects	28	81	41	30		2.406	2.000	0.944	
	7.The organization has a specific process for recruiting and developing project managers	32	44	61	43		2.639	3.000	1.034	
	8.Project managers are also involved in the human resource management of projects	10	31	55	81	3	3.200	3.000	0.936	
	9.The project manager's competence is considered as a success factor for projects performance	7	42	55	52	24	3.244	3.000	1.076	
	10. Project management training is provided for project team members	32	85	26	34	3	2.394	2.000	1.038	
	11. The well-being of project members is given due attention by the organization	15	69	59	29	8	2.700	3.000	0.985	
	12.The organization has a specific process of developing a project manager that includes training, mentoring, and coaching	33	84	37	25	1	2.317	2.000	0.948	
	V. Behavior									
	1.Projects are managing the communications right: the right information reaching the right team member	7	81	51	36	5	2.728	3.000	0.920	
	2.There is a defined formal communication framework that involve all external and internal stakeholders of the project	3	80	72	23	2	2.672	3.000	0.761	0.716
	3.There is an understanding on the expectations of important stakeholders of the project	1	74	63	40	2	2.822	3.000	0.820	
	4.The organization is flexible to of adapt its processes and Structures to the evolving context	17	59	66	37	1	2.700	3.000	0.921	
	5.Cross-functional teams are prevalent at projects	6	82	54	37	1	2.694	3.000	0.853	
	6.The organization is working to adopt a project-oriented culture	7	80	52	40	1	2.711	3.000	0.875	

Table 5.7 Likert scale responses, mean scores, median, standard deviations, and reliability test scores of Section D

Section	Item	Likert Scale Responses					Mean	Median	SD	Cronbach's alpha coefficient
		SD	D	N	A	SA				
D	**Antecedents of organizational design dimensions of full-fledged PBOs ,Overall reliability= 0.937**									
	I. Project orientation									
	1.Strategic documents are prepared with consideration of projects	3	72	60	42	3	2.833	3.000	0.862	0.707
	2.The organization recognize the significance of projects	1	41	49	83	6	3.289	3.000	0.875	
	3.The strategic value of a proper project management is understood by the organization	3	61	40	65	11	3.111	3.000	1.002	
	II. Project working									
	1.Project work processes are well designed by the upper managment	11	95	43	30	1	2.528	2.000	0.862	0.748
	2.Organization and project work procedures are aligned	9	77	52	41	1	2.711	3.000	0.894	
	3.Standard project management processes are sufficiently incorporated to execute project works	6	79	67	28		2.650	3.000	0.780	
	III. Fit									
	1.The well defined processes at the organization are conducive to bring behavioural improvements at projects	15	74	56	35		2.617	3.000	0.892	0.768
	2.The actual work proceses match the designed organizational structure of the organization	27	74	49	30		2.456	2.000	0.941	
	3.The existing organizational structure align with strategy of the organization	22	59	48	51		2.711	3.000	1.011	
	IV. Project culture									
	1.The mindset of project members is ready to take in new better systems to their projects	3	67	63	43	4	2.878	3.000	0.869	0.704
	2.The organization easily adapt to changes when commencing new projects	4	92	46	30	8	2.700	2.000	0.927	
	3.There is a culture of planning than rushing to project works	9	73	45	52	1	2.794	3.000	0.938	
	4.There is no difficulty for the organization to develop an identity due to high turnover	21	72	57	29	1	2.539	2.000	0.918	
	V. Churn (the continuous repositioning of employees from projects)									
	1.Most project works are currently subcontracted		1	10	124	45	4.183	4.000	0.544	0.708
	2.Motivational schemes are in place for project staffs									
	being transferred to other projects	28	75	58	19		2.378	2.000	0.873	
	3.Project members are satisfied by the existing project work procedures	27	74	62	17		2.383	2.000	0.854	
	VI. History and context of organization, leadership									
	1. Autonomy is given to upper level managers by the shareholders	4	74	67	33	2	2.750	3.000	0.818	0.706
	2.The shareholders of the organization have a long term vision	3	56	69	48	4	2.967	3.000	0.858	
	3.The organization has a proper strategic document	5	57	86	32		2.806	3.000	0.756	
	4.There are sufficient ethical professionals available in the market	6	82	60	30	2	2.667	3.000	0.832	
	5. There is fair competitive bidding trend in the construction industry to acquire projects	24	80	55	21		2.406	2.000	0.863	
	VII. Size									
	1.Project execution plans in the organization depend on the size of the projects	2	39	68	64	7	3.194	3.000	0.859	0.710
	2.The organization is competitive in bigger sized projects	5	72	68	34	1	2.744	3.000	0.813	
	3.The organizational structure of projects consider the size of the projects	3	42	58	73	4	3.183	3.000	0.875	
	VIII. A shareholder versus stakeholder orientation(Governance)									
	1.The continuous improvement of project members performance is monitored by the shareholders	3	105	45	25	2	2.544	2.000	0.793	0.716
	2.There is a corporate level thinking by the shareholders	10	71	58	39	2	2.967	3.000	0.865	
	3. Shareholders are the dominate ones than stakeholders in managing projects	2	62	58	56	2	2.594	3.000	0.796	
	IX. Control by behaviours or results									
	1.The organization is not focused with its current problems just to complete their projects	9	79	70	20	2	2.594	3.000	0.796	0.705
	2.The organization has a strong structure that could enable to follow up projects	6	71	57	44	2	2.806	3.000	0.885	
	3.The organization continuously evaluate its project works	4	70	51	51	4	2.894	3.000	0.918	
	X. Uncertainty, dynamism, and complexity									
	1. Project owners interests are changing frequently	17	100	44	19		2.361	2.000	0.796	0.713
	2.The organization is not busy to acquire projects with different approaches	9	79	74	18		2.561	3.000	0.741	
	3.The current economic enviornment of the country is encouraging to plan for long term	23	80	70	7		2.339	2.000	0.749	
	XI. Awareness and knowledge of project management									
	1.There is sufficient project management knowledgeat project levels	28	87	26	39		2.422	2.000	0.997	0.704
	2.There is sufficient project management knowledge by upper managers	8	87	45	40		2.650	2.000	0.875	
	3. Project members understand the nature of projects	20	55	66	37	2	2.700	3.000	0.957	
	XII. Creating project core teams									
	1.Formal teams from different departments are created for execution of project works	25	79	23	53		2.578	2.000	1.057	0.770
	2.The current project set ups are conducive to execute tasks	15	60	43	62		2.844	3.000	0.996	
	3.Upper managers understand the value of a core team approach	11	74	44	51		2.750	3.000	0.939	
	XIII. Strategic project management Information system									
	1. Value is given by upper managers for organizational wide information system	3	87	54	34	2	2.694	2.500	0.833	0.707
	2.There is an information system for communications between project members	4	70	86	19	1	2.683	3.000	0.713	
	3. Project stakeholders information is properly shared on projects	7	80	72	21		2.594	3.000	0.745	
	4. The prevalent system at projects supports organizational learning	7	103	52	18		2.450	2.000	0.727	
	5.There is a digitalized documentation system at projects	28	109	30	13		2.156	2.000	0.768	
	XIV. Dynamic capability and organizational learning									
	1.New work methods are appreciated to execute project tasks	11	74	54	38	3	2.711	3.000	0.924	0.718
	2.There is a tendency towards managing projects in new innovative approaches	20	75	57	28		2.517	2.000	0.887	
	3.The organization is determined to properly establish project management processes at projects	8	50	79	42	1	2.878	3.000	0.837	
	4. There is no resistance to a system change on managing projects due to fear of failure	13	97	53	15	2	2.422	2.000	0.791	
	XV. Upper management support									
	1. There is a continuous support to projects at implementation phase by the upper management	15	81	45	30	9	2.650	2.000	1.016	0.820
	2. Upper managers give feedbacks to project reports	22	68	40	43	7	2.694	2.500	1.084	
	3. Upper managers positively influence the behavior of projects members	13	80	53	31	3	2.617	2.000	0.911	
	4.There is a continuous communication between the upper management and projects	17	60	42	51	10	2.872	3.000	1.099	
	XVI. Competency of project managers									
	1.The processes necessary to select and develop project managers are in place	21	65	57	37		2.611	3.000	0.942	0.788
	2. Project managers are autonomous in their works	15	90	33	40	2	2.578	2.000	0.963	
	3.Project manager's work with sufficient project management knowledge	26	69	47	33	5	2.567	2.000	1.036	
	4.The project managers in the organization has a leadership capability	11	84	59	21	5	2.583	2.000	0.877	
	5.Changes are properly handled by project managers	26	72	51	27	4	2.506	2.000	0.989	

5.3.2 Test for Normality

Before further statistical tests, it is necessary to establish the distribution of values for variables containing numerical data, whether normally distributed or not. A special symmetric distribution in which the data can be plotted as a bell-shaped curve is known as a normal distribution (Saunders, Lewis & Thornhill, 2009:436). If the test for normality does not reject a normal distribution, this suggests a parametric procedure that assumes normality can be safely used. There are different approaches to checking normality. The commonly used test for checking normality is the Skewness and Kurtosis test. According to Kim (2013: 53), for the data distribution to be generally distributed for medium-sized samples (between 50 and 300), the absolute value Z scores should be less than 3.29. Tables 5.6 and 5.7 depicted the mean scores of the different organisational design dimensions necessary for ECFs, and their antecedents were calculated before parametric tests.

The Skewness and Kurtosis test results in Table 5.8 indicated that the absolute value Z scores are below 3.29 and, therefore, could be considered normally distributed. There are two cases with z-scores above 3.29 in Table 5.9, but their Skewness statistic is still within the range of -1 to +1 (Pallant, 2020:111). Also, the analysis of variance (ANOVA) tests with sufficient sample sizes are robust to moderate departure from normality. Then parametric tests, Anova and Pearson correlations, are used for further analysis.

Table 5.8 Skewness and Kurtosis tests

Variables	Skewness			Kurtosis		
	Statistic	Std. Error	Z score	Statistic	Std. Error	Z score
Salient characteristics of full-fledged PBOs	0.51	0.18	2.81	0.95	0.36	2.63
Strategy	0.48	0.18	2.63	0.37	0.36	1.02
Structure	0.25	0.18	1.39	-0.23	0.36	-0.65
Process	0.30	0.18	1.63	-0.26	0.36	-0.71
Behaviour	0.32	0.18	1.74	-0.11	0.36	-0.31
Human resource	0.12	0.18	0.66	-0.64	0.36	-1.77
Project orientation	0.07	0.18	0.41	-0.56	0.36	-1.56
Project working	0.52	0.18	2.87	-0.57	0.36	-1.58
Fit	-0.14	0.18	-0.78	-0.29	0.36	-0.81
Project culture	0.46	0.18	2.54	-0.36	0.36	-1.01
Churn	0.06	0.18	0.34	-0.42	0.36	-1.16
History and context of the organisation	-0.40	0.18	-2.22	-0.49	0.36	-1.35
Size	-0.48	0.18	-2.67	0.10	0.36	0.29
A shareholder versus stakeholder orientation	0.17	0.18	0.92	-0.83	0.36	-2.29
Control by behaviour or results	0.16	0.18	0.87	-0.16	0.36	-0.46
Uncertainty, dynamism, and complexity	-0.09	0.18	-0.47	-0.02	0.36	-0.04
Awareness and knowledge of project management	0.31	0.18	1.74	-0.70	0.36	-1.95
Project core team	0.72	0.18	3.97	1.66	0.36	4.61
Strategic project management information system	0.53	0.18	2.94	0.94	0.36	2.61
Dynamic capability and organisational learning	0.18	0.18	1.00	0.15	0.36	0.42
Upper management support	0.32	0.18	1.74	-0.54	0.36	-1.50
Competency of project managers	0.66	0.18	3.66	-0.39	0.36	-1.07

5.3.3 Relation between antecedents necessary for organisational design dimensions of ECFs versus background information of the respondents (One-way ANOVA)

It is essential to check the presence of any statistical relationship between the data collected and the different groups of the respondent's background. For example, one-way ANOVA tests were used to determine whether the average scores on antecedents, Section D of the questionnaire, are related to the respondents' background information, Section A of the questionnaire. One-way analysis of variance is similar to a t-test but is used when the researcher has two or more groups and wishes to compare their mean scores on a continuous variable. It is called One-way because it looks at the impact of only one independent variable on

the dependent variable (Pallant, 2020:105). Pallant (2020:242) further explained an F-ratio as follows:

"An F-ratio is calculated to represent the variance between the groups, divided by the variance within the groups. A large F-ratio indicates more variability between the groups (caused by the independent variable) than within each group (referred to as the error term). A significant F-test thus tells one that the three or more groups differ from one another, but it does not tell one which of the groups differ."

A 5% significance level is chosen as a benchmark for this research.

(a) Antecedents necessary for organisational design dimensions of ECFs with 'Type of organisation of respondents'

The One-way ANOVA test result revealed no significant relationship between the antecedents necessary for organisational design dimensions of ECFs and the 'type of organisation of respondents' (Appendix VI-A). All the significance levels were greater than 0.05. Therefore the 'type of organisation of the respondents' did not result in different responses from the respondents concerning the antecedents being studied.

(b) Antecedents necessary for organisational design dimensions of ECFs with 'Educational qualification of respondents'

The One-way ANOVA test result also indicated no significant relationship between the antecedents necessary for organisational design dimensions of ECFs and the educational qualification of respondents (Appendix VI-B). Therefore, the 'educational qualification of the respondents' did not result in different responses concerning the antecedents being studied.

(c) Antecedents necessary for organisational design dimensions of ECFs with 'Experience of the respondents' organisations'

The One-way ANOVA test result identified no significant relationship between the antecedents necessary for organisational design dimensions of ECFs and the experience of the respondents' organisations (Appendix VI-C). Therefore the

‘experience of the respondents’ organisation’ did not result in different responses from the respondents concerning the antecedents being studied.

(d) Antecedents necessary for organisational design dimensions of ECFs with ‘level of project management training’

The one-way ANOVA test uncovered a relationship only between two of the antecedents necessary for organisational design dimensions of ECFs: ‘Project orientation’ and ‘Upper management support’, with ‘the level of project management training taken by the respondents’ as shown in Table 5.9. The specific significance levels (0.037 and 0.039) were below 0.05, as shown in Table 5.9. A significant F-test told that the three or more groups differ from one another, but it did not tell which of the groups differ.

The researcher needed to conduct a Post Hoc comparison to determine the difference between the respondent groups. A Post hoc test is a technique for determining which pairs of means are significantly different. Before selecting the type of Post Host test, Levene’s test should be conducted to check whether the group variances are homogenous. If Levene’s test is significant (the value under “Sig.” is less than 0.05), the variances are significantly different. But if it is not significant (“Sig.” is greater than 0.05), the variances are not significantly different; that is, the variances are approximately equal (Field, 2009:150).

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Table 5.9: One-way ANOVA

(Antecedents necessary for organisational design dimensions of ECFs versus 'Level of project management training of respondents')

		Sum of Squares	df	Mean Square	F	Sig.
Project orientation	Between Groups	4.472	3	1.491	2.899	**0.037**
	Within Groups	90.498	176	0.514		
	Total	94.970	179			
Project working	Between Groups	2.046	3	.682	1.442	.232
	Within Groups	83.262	176	.473		
	Total	85.309	179			
Project culture	Between Groups	.114	3	.038	.077	.972
	Within Groups	86.795	176	.493		
	Total	86.909	179			
Churn	Between Groups	1.856	3	.619	1.500	.216
	Within Groups	72.595	176	.412		
	Total	74.451	179			
History and context of the organisation	Between Groups	2.351	3	.784	2.463	.064
	Within Groups	56.009	176	.318		
	Total	58.360	179			
Size	Between Groups	3.422	3	1.141	2.463	.064
	Within Groups	81.502	176	.463		
	Total	84.923	179			
A shareholder versus stakeholder orientation	Between Groups	1.573	3	.524	1.106	.348
	Within Groups	83.450	176	.474		
	Total	85.022	179			
Control by behaviour or results	Between Groups	.547	3	.182	.372	.773
	Within Groups	86.155	176	.490		
	Total	86.701	179			
Uncertainty, dynamism, and complexity	Between Groups	.803	3	.268	.722	.540
	Within Groups	65.278	176	.371		
	Total	66.081	179			
Awareness and knowledge of project management	Between Groups	2.481	3	.827	1.476	.223
	Within Groups	98.590	176	.560		
	Total	101.072	179			
Project core team	Between Groups	4.029	3	1.343	1.965	.121
	Within Groups	120.283	176	.683		
	Total	124.311	179			
Strategic project management information system	Between Groups	.896	3	.299	1.133	.337
	Within Groups	46.386	176	.264		
	Total	47.282	179			
Dynamic capability and organisational learning	Between Groups	2.392	3	.797	1.902	.131
	Within Groups	73.761	176	.419		
	Total	76.153	179			
Upper management support	Between Groups	5.893	3	1.964	2.847	**.039**
	Within Groups	121.416	176	.690		
	Total	127.309	179			
Competency of project managers	Between Groups	.376	3	.125	.238	.870
	Within Groups	92.672	176	.527		
	Total	93.048	179			

Levene's test was performed to test whether variances between the ‘level of project management training’ group scores on ‘project orientation’ and ‘upper management support’ were homogenous. Table 5.10 indicates that the significance levels are 0.849 and 0.992, which are more than 0.05. Therefore it can be assumed that the group variances are almost equal or homogenous.

Table 5.10 Test of Homogeneity of Variance

	Levene Test Statistic	df1	df2	Sig.
Project orientation	.268	3	176	.849
Upper management support	.033	3	176	.992

There are differences among the groups of ‘level of project management training’ on the ‘project orientation’ and ‘upper management support’ mean scores, as shown in Table 5.9. Therefore, for data with homogenous variances, a Tukey HSD is a recommendable Post Hoc test (Field, 2009:374).

Table 5.11 Tukey HSD Post Hoc Test on level of PM training

Dependent Variable	Level of PM training(I)	Level of PM training(J)	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Project orientation	Masters	Certificate	-0.01792	0.43357	1.000	-1.1425	1.1067
		Short term training	-0.27350	0.42345	0.917	-1.3718	0.8248
		As a course	-0.44444	0.42160	0.718	-1.5380	0.6491
	Certificate	Masters	0.01792	0.43357	1.000	-1.1067	1.1425
		Short term training	-0.25558	0.15652	0.363	-0.6615	0.1504
		As a course	**-.42652***	0.15144	0.027	-0.8193	-0.0337
	Short term training	Masters	0.27350	0.42345	0.917	-0.8248	1.3718
		Certificate	0.25558	0.15652	0.363	-0.1504	0.6615
		As a course	-0.17094	0.11941	0.481	-0.4807	0.1388
	As a course	Masters	0.44444	0.42160	0.718	-0.6491	1.5380
		Certificate	.42652*	0.15144	0.027	0.0337	0.8193
		Short term training	0.17094	0.11941	0.481	-0.1388	0.4807
Upper management support	Masters	Certificate	1.29839	0.50220	0.051	-0.0042	2.6010
		Short term training	0.94615	0.49048	0.220	-0.3260	2.2183
		As a course	1.04938	0.48834	0.142	-0.2172	2.3160
	Certificate	Masters	-1.29839	0.50220	0.051	-2.6010	0.0042
		Short term training	-0.35223	0.18129	0.214	-0.8225	0.1180
		As a course	-0.24900	0.17542	0.489	-0.7040	0.2060
	Short term training	Masters	-0.94615	0.49048	0.220	-2.2183	0.3260
		Certificate	0.35223	0.18129	0.214	-0.1180	0.8225
		As a course	0.10323	0.13831	0.878	-0.2555	0.4620
	As a course	Masters	-1.04938	0.48834	0.142	-2.3160	0.2172
		Certificate	0.24900	0.17542	0.489	-0.2060	0.7040
		Short term training	-0.10323	0.13831	0.878	-0.4620	0.2555

*. The mean difference is significant at the 0.05 level

Regarding project orientation versus the level of PM training, the results showed that the significance levels were above 0.05 (showing the differences between the groups were not statistically significant) except in one case. The only significant difference was between the mean scores of ‘certificate taken as a course’ and PM training levels on the ‘project orientation’ scores, as shown in Table 5.11. According to the Tukey HSD Post Hoc test result in Table 5.11, upper management support versus

the level of PM training, the significance of all the mean differences was above 0.05, showing no statistically significant differences. Therefore there is no significant difference between the different levels of PM training acquired by respondents on the upper management support mean scores at 5% significance level.

(e) Antecedents necessary for organisational design dimensions of ECFs With 'experience of respondents'

A One-way ANOVA test showed a significant relationship between two antecedents necessary for organisational design dimensions of ECFs ('History and context of the organisation,' 'uncertainty', 'dynamism', and 'complexity') with 'experience of the respondents'. Their significance levels were 0.032 and 0.000; both were below 0.05, as shown in Table 5.12.

Table 5.12: One-way ANOVA, Antecedents necessary for organisational design dimensions of ECFs versus 'experience of respondents'

		Sum of Squares	df	Mean Square	F	Sig.
Project orientation	Between Groups	.549	2	.275	.515	.598
	Within Groups	94.420	177	.533		
	Total	94.970	179			
Project working	Between Groups	.349	2	.175	.364	.696
	Within Groups	84.960	177	.480		
	Total	85.309	179			
Fit	Between Groups	.410	2	.205	.301	.740
	Within Groups	120.403	177	.680		
	Total	120.812	179			
Project culture	Between Groups	.765	2	.383	.786	.457
	Within Groups	86.144	177	.487		
	Total	86.909	179			
Churn	Between Groups	2.275	2	1.137	2.789	.064
	Within Groups	72.177	177	.408		
	Total	74.451	179			
History and context of the organisation	Between Groups	2.227	2	1.114	3.512	**.032**
	Within Groups	56.133	177	.317		
	Total	58.360	179			
Size	Between Groups	1.267	2	.633	1.340	.264
	Within Groups	83.657	177	.473		
	Total	84.923	179			
A shareholder versus stakeholder orientation	Between Groups	.517	2	.259	.542	.583
	Within Groups	84.505	177	.477		
	Total	85.022	179			
Control by behaviour or results	Between Groups	1.159	2	.580	1.199	.304
	Within Groups	85.542	177	.483		
	Total	86.701	179			
Uncertainty, dynamism and complexity	Between Groups	6.044	2	3.022	8.910	**.000**
	Within Groups	60.037	177	.339		
	Total	66.081	179			
Awareness and knowledge of project management	Between Groups	2.845	2	1.422	2.563	.080
	Within Groups	98.227	177	.555		
	Total	101.072	179			
Project core team	Between Groups	2.059	2	1.030	1.491	.228
	Within Groups	122.252	177	.691		
	Total	124.311	179			
Strategic project management information system	Between Groups	1.150	2	.575	2.207	.113
	Within Groups	46.132	177	.261		
	Total	47.282	179			
Dynamic capability and organisational learning	Between Groups	1.107	2	.554	1.306	.274
	Within Groups	75.046	177	.424		
	Total	76.153	179			
Upper management support	Between Groups	.161	2	.080	.112	.894
	Within Groups	127.149	177	.718		
	Total	127.309	179			
Competency of project managers	Between Groups	.161	2	.081	.154	.858
	Within Groups	92.887	177	.525		
	Total	93.048	179			

A Levene's test was performed to test variances between the different categories of ‘experience of respondents’ on ‘History and context of the organisation’ and ‘Uncertainty, dynamism, and complexity’. As shown in Table 5.13, the significance levels are 0.793 and 0.463 for ‘History and context of the organisation’ and ‘Uncertainty, dynamism, and complexity’, respectively. Both were more than 0.05 with assumed homogenous variances.

Table 5.13 Tests of Homogeneity of Variance

	Levene Test Statistic	df1	df2	Sig.
History and context of the organisation	.232	2	177	.793
Uncertainty, dynamism and complexity	.772	2	177	.463

Differences were noticed among the groups: ‘Experience of respondents’ on ‘History and context of the organisation’ and ‘Uncertainty, dynamism, and complexity’ scores, as shown in Table 5.12. But the researcher further checked which groups’ mean differences were significant. For such data with homogenous variances, the Tukey HSD Post Hoc test is recommendable (Field, 2009:374).

According to the Tukey HSD Post Hoc Test results in Table 5.14, the significances of all mean differences were above 0.05 for ‘History and context of the organisation’, showing their differences were not statistically significant. Therefore there is no significant difference between the different groups: ‘Experience of respondents on the mean scores of the ‘History and context of the organisation’ at a 5% significance level. The only significant difference was in the ‘Experience of respondents’ groups on scores of ‘Uncertainty, dynamism, and complexity’, as shown in Table 5.14. There was a significant difference between respondents' experience from 6 to 10 years and ‘over 15 years and between ‘from 11 to 15 years and ‘over 15 years on their uncertainty, dynamism, and complexity scores’.

Table 5.14 Tukey HSD Post Hoc Test for experience of respondents

Dependent Variables	(I) Experience of the respondent	(J) Experience of the respondent	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
History and context of the organisation	From 6 to 10 years	From 11 to 15 years	0.02434	0.10818	0.972	-0.2314	0.2800
		Over 15 years	0.242	0.10651	0.062	-0.0097	0.4937
	From 11 to 15 years	From 6 to 10 years	-0.02434	0.10818	0.972	-0.28	0.2314
		Over 15 years	0.21766	0.09773	0.069	-0.0133	0.4487
	Over 15 years	From 6 to 10 years	-0.242	0.10651	0.062	-0.4937	0.0097
		From 11 to 15 years	-0.21766	0.09773	0.069	-0.4487	0.0133
Uncertainty, dynamism, and complexity	From 6 to 10 years	From 11 to 15 years	0.02948	0.11188	0.962	-0.235	0.2939
		Over 15 years	**.39315***	0.11015	0.001	0.1328	0.6535
	From 11 to 15 years	From 6 to 10 years	-0.02948	0.11188	0.962	-0.2939	0.235
		Over 15 years	**.36368***	0.10107	0.001	0.1248	0.6026
	Over 15 years	From 6 to 10 years	-.39315*	0.11015	0.001	-0.6535	-0.1328
		From 11 to 15 years	-.36368*	0.10107	0.001	-0.6026	-0.1248

*. The mean difference is significant at the 0.05 level.

The One-way ANOVA test results showed no significant differences between the scores of the different groups of the background of the respondents (‘Type of organisation of respondents’; ‘Educational qualification of respondents’, ‘Experience of the respondents’ organisations’) on the mean scores of the Antecedents necessary for organisational design dimensions of ECFs. The ‘Certificate’ and ‘Taken as a course’ groups of ‘the level of project management training’ have shown a mean difference in their ‘Upper management support’ scorings. But there was no significant score difference between the other ‘the level of project management training’ groups on the ‘Upper management support’ scores. There was also a significant difference between respondents' experiences ‘from 6 to 10 years and ‘over 15 years and between ‘from 11 to 15 years and ‘over 15 years on their scores of ‘uncertainty, dynamism, and complexity’. There were also no significant score

differences between the other ‘the experiences of respondents’ groups on the scoring of ‘uncertainty, dynamism, and complexity’.

5.3.4 Correlation

Correlational statistics describe and measure the degree of association between two or more variables or sets of scores (Creswell, 2014:41). A Pearson correlation is an appropriate correlation test used to evaluate associations between variables of a parametric data set (Sekaran, 2003:401).

(a) Correlation between organisational design dimensions and the salient characteristics of full-fledged PBOs

Associations of organisational design dimensions with the salient characteristics of full-fledged PBOs were examined through a correlation analysis, with the result shown in Table 5.15. The result showed a positive relationship between ‘strategy’ and ‘structure’ with the salient characteristics of full-fledged PBOs (0.296 and 0.343). ‘Behaviour’, ‘process’, and ‘human resource’ indicated a relatively stronger relationship with the salient characteristics of full-fledged PBOs (0.599, 0.486, and 0.479).

Table 5.15 Correlation between organisational design dimensions and the salient characteristics of full-fledged PBOs

		Strategy	Process	Structure	Human resource	Behaviour	Salient characteristics of full-fledged PBOs
Strategy	Pearson Correlation	1	.208**	.188*	.176*	.171*	.296**
	Sig. (2-tailed)		0.005	0.012	0.018	0.022	0.000
	N	180	180	180	180	180	180
Process	Pearson Correlation	.208**	1	.209**	.517**	.386**	.486**
	Sig. (2-tailed)	0.005		0.005	0.000	0.000	0.000
	N	180	180	180	180	180	180
Structure	Pearson Correlation	.188*	.209**	1	.362**	.317**	.343**
	Sig. (2-tailed)	0.012	0.005		0.000	0.000	0.000
	N	180	180	180	180	180	180
Human resource	Pearson Correlation	.176*	.517**	.362**	1	.359**	.479**
	Sig. (2-tailed)	0.018	0.000	0.000		0.000	0.000
	N	180	180	180	180	180	180
Behaviour	Pearson Correlation	.171*	.386**	.317**	.359**	1	.599**
	Sig. (2-tailed)	0.022	0.000	0.000	0.000		0.000
	N	180	180	180	180	180	180
Salient characteristics of full-fledged PBOs	Pearson Correlation	.296**	.486**	.343**	.479**	.599**	1
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	
	N	180	180	180	180	180	180

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

(b) Correlation between antecedents and organisational design dimensions of full-fledged PBOs

Associations among antecedents necessary for organisational design dimensions of ECFs and organisational design dimensions were examined through correlation analysis, with its result shown in Table 5.16.

Table 5.16 Correlation between antecedents necessary for organisational design dimensions of ECFs and organisational design dimensions of PBOs

		Strategy	Process	Structure	Human resource	Behaviour
Project orientation	Pearson Correlation	.219**	.516**	.300**	.339**	.500**
	Sig. (2-tailed)	0.003	0.000	0.000	0.000	0.000
	N	180	180	180	180	180
Project working	Pearson Correlation	.152*	.622**	.271**	.468**	.500**
	Sig. (2-tailed)	0.042	0.000	0.000	0.000	0.000
	N	180	180	180	180	180
Fit	Pearson Correlation	.166*	.515**	.269**	.498**	.379**
	Sig. (2-tailed)	0.026	0.000	0.000	0.000	0.000
	N	180	180	180	180	180
Project culture	Pearson Correlation	0.095	.290**	.190*	.207**	.424**
	Sig. (2-tailed)	0.204	0.000	0.011	0.005	0.000
	N	180	180	180	180	180
Churn	Pearson Correlation	-0.144	-0.028	-0.009	.260**	0.117
	Sig. (2-tailed)	0.054	0.706	0.909	0.000	0.117
	N	180	180	180	180	180
History and context of the organisation	Pearson Correlation	.285**	.435**	.215**	.265**	.334**
	Sig. (2-tailed)	0.000	0.000	0.004	0.000	0.000
	N	180	180	180	180	180
Size	Pearson Correlation	.246**	.196**	.315**	.177*	.358**
	Sig. (2-tailed)	0.001	0.008	0.000	0.017	0.000
	N	180	180	180	180	180
A shareholder versus stakeholder orientation	Pearson Correlation	0.123	.275**	.260**	.231**	.404**
	Sig. (2-tailed)	0.100	0.000	0.000	0.002	0.000
	N	180	180	180	180	180
Control by behaviour or results	Pearson Correlation	.176*	.298**	.219**	.324**	.482**
	Sig. (2-tailed)	0.018	0.000	0.003	0.000	0.000
	N	180	180	180	180	180
Uncertainty, dynamism, and complexity	Pearson Correlation	-0.052	.157*	0.041	0.136	.202**
	Sig. (2-tailed)	0.488	0.035	0.581	0.068	0.007
	N	180	180	180	180	180
Awareness and knowledge of project management	Pearson Correlation	-0.014	.288**	0.139	0.103	.390**
	Sig. (2-tailed)	0.851	0.000	0.064	0.169	0.000
	N	180	180	180	180	180
Project core team	Pearson Correlation	0.050	.577**	.210**	.264**	.315**
	Sig. (2-tailed)	0.503	0.000	0.005	0.000	0.000
	N	180	180	180	180	180
Strategic project management information system	Pearson Correlation	.228**	.450**	.177*	.253**	.315**
	Sig. (2-tailed)	0.002	0.000	0.018	0.001	0.000
	N	180	180	180	180	180
Dynamic capability and organisational learning	Pearson Correlation	0.078	.285**	.174*	0.122	.338**
	Sig. (2-tailed)	0.300	0.000	0.020	0.103	0.000
	N	180	180	180	180	180
Upper management support	Pearson Correlation	0.019	.396**	.314**	.224**	.452**
	Sig. (2-tailed)	0.804	0.000	0.000	0.002	0.000
	N	180	180	180	180	180
Competency of project managers	Pearson Correlation	-0.076	.276**	.158*	0.114	.316**
	Sig. (2-tailed)	0.310	0.000	0.034	0.129	0.000
	N	180	180	180	180	180

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

The correlational statistics results in Table 5.16 between antecedents necessary for organisational design dimensions of ECFs and organisational design dimensions of full-fledged PBOs indicated the presence of a significant relationship between different antecedents necessary for organisational design dimensions of ECFs and organisational design dimensions of full-fledged PBOs. The prevalent associations between the specific antecedents and organisational dimensions are summarised in Table 5.17 to provide a clear overview.

Table 5.17 Associations between antecedents necessary for organisational design dimensions of ECFs and organisational design dimensions of PBOs

Antecedents	Organisation Design Dimensions of full-fledged PBOs				
	Strategy	Process	Structure	Human Resource	Behaviour
Project orientation	x	x	x	x	x
Project working	x	x	x	x	x
Fit	x	x	x	x	x
Project culture	x	x	x	x	x
Churn				x	
History and context of the organisation	x	x	x	x	x
Size	x	x	x	x	x
A shareholder versus stakeholder orientation		x	x	x	x
Control by behaviour or results	x	x	x	x	x
Uncertainty, dynamism, and complexity		x			x
Awareness and knowledge of project management		x			x
Project core team		x	x	x	x
Strategic project management information system	x	x	x	x	x
Dynamic capability and organisational learning		x	x		x
Upper management support		x	x	x	x
Competency of project managers		x	x		x

Associations between organisational design dimensions of full-fledged PBOs and salient characteristics of full-fledged PBOs were examined through a correlation

analysis. The results showed a significant positive correlation between the salient characteristics of full-fledged PBOs with all five organisational design dimensions (strategy, process, structure, human resource, and behaviour). Furthermore, it was found using the analysis that all sixteen antecedents had a relationship with at least one of the five organisational design dimensions of full-fledged PBOs, as shown in Table 5.17.

5.4 Chapter Summary

This chapter presented the qualitative and quantitative data analysis results. The study started with a qualitative study followed by a quantitative study on Project orientation, Project working, Fit, Project culture, Churn, History and context of the organisation, Size, Shareholder versus stakeholder orientation, Control by behaviour or results, and Uncertainty, dynamism, and complexity were the ten antecedents identified through an extensive literature review. Moreover, the qualitative interviews revealed six new antecedents: Awareness and knowledge of project management, Project core team, Strategic project management information systems, Upper management support, Dynamic capability and organisational learning, and Competency of project managers.

The quantitative survey was planned to involve more subjects to generalise results. The quantitative analysis started with a study of the profile of the respondents. Then the summary of the Likert scale responses, mean scores, medians, standard deviations, and reliability test scores for the different sections was presented. Before the statistical tests, a normality test was done, and the data proved normally distributed. The appropriate group comparison test for this study was a One-way ANOVA test.

All sixteen antecedents were associated with at least one of the five organisational design dimensions of full-fledged PBOs in the Ethiopian construction industry. In turn, it is also confirmed that the five organisational design dimensions of full-fledged PBOs (strategy, process, structure, human resource, and behaviour) positively correlate with the salient characteristics of full-fledged PBOs. Therefore, this chapter presented the data analysis of the study. The synthesis and analysis of the research results will be covered in the next chapter, Chapter 6.

CHAPTER 6: SYNTHESIS AND ANALYSIS OF THE RESEARCH RESULTS

6.1 Introduction

Based on the research results presented in Chapter 5, this chapter discusses the findings related to the research questions and propositions formulated in Chapter 1, Section 1.4. It proceeds from the data presented to an analysis of the extent to which this data prove or disprove the research propositions and consequently answers research questions.

In line with the contingency perspective, intra-organisational design dimensions should be considered together with the salient contextual antecedents since particular complementarities differ in various organisational contexts. Therefore, the core dimensions of the organisational design of Ethiopian construction firms (ECFs) and their key antecedents are discussed in the following sections.

6.2 Review of the Research Propositions

6.2.1 Proposition One (P1): "The core dimensions of organisational design are part of the fundamental requirements for local Ethiopian construction firms" is the first proposition formulated in Chapter 1, Section 1.4.

This study confirmed in Chapter 5, Section 5.2.2 and Chapter 5, Section 5.3.4 (a) that strategy, process, structure, human resources, and behaviour are core dimensions of the organisational design of ECFs necessary to be full-fledged PBOs. These core organisational design dimensions will be discussed next.

Strategy

The qualitative and quantitative research data analysis identified 'strategy' as one of the organisational design dimensions of ECFs, as presented in Chapter 5, Section 5.2.2, 5.3.1, 5.3.2, 5.3.3 and 5.3.4. 'Strategy' is associated with salient characteristics of full-fledged PBOs (0.296), as shown in Table 5.15. The research findings showed that construction firms are not performing internal and external business environment assessments according to the expected level. It includes an assessment of the history

and context of the organisation (including leadership style); the size of the firm(s) and its projects; uncertainty, dynamism, and complexity (including macroeconomic and regulatory framework uncertainties and the complexity level of projects). It caused the road to formal strategic plan preparation to be very difficult. The study depicted the absence of a formal strategic plan in construction firms. Also, most construction firms do not have a policy for environmental assessment and strategic plan preparation.

Even though the value of projects seems to be understood by construction firms, these firms are not fully project-oriented. The selection of projects typically did not derive from the strategic intent of the firms. Also, there is no evidence of alignment between the organisation and project priorities in the execution phase. Many project managers assume that their projects are unlinked to a coherent strategy. Due to this, few project members believed they were working cross-purposes on redundant projects. A strategic emphasis on projects helps to resolve such negative feelings, which is the initial move towards creating a favourable project environment. Strategic choices between control by behaviour or results and a choice between stakeholder and shareholder management should be considered in the strategic plan preparation.

There are many reasons for creating a solid linkage between projects and organisational strategy. Project members look for direction, mainly when setting project goals. When project leaders understand organisational strategy, they have a guide for action. It helps them define the goals of the project. Understanding the firms' strategy also motivates project leaders as it helps them understand their project as part of a whole system. A clear link to strategy also helps develop inter-project cooperation likely to be achieved if project managers feel they are part of the larger “project” for implementing a strategy (Englund and Graham, 2019:101).

Process

The research data analysis identified ‘process’ as one of the organisational design dimensions of ECFs, as presented in Chapter 5, Section 5.2.2, 5.3.1, 5.3.2, 5.3.3, and 5.3.4. ‘Process’ correlates with the salient characteristics of full-fledged PBOs (0.486) as shown in Table 5.15.

The majority of construction firms do not define standard project management processes. Also, project communication has not been well documented and controlled. The upper managers of the construction firms do not have sufficient awareness and knowledge of project management. Project management processes, tools, and techniques are needed at all levels for running a PBO. The standard project management processes must be initially defined to ensure project-based working (Englund and Graham, 2019:10).

Structure

The data and analysis of the research identified ‘structure’ as one of the organisational design dimensions of ECFs, as presented in Chapter 5, Section 5.2.2, 5.3.1, 5.3.2, 5.3.3, and 5.3.4. ‘Structure’ has a positive correlation (0.343) with salient characteristics of full-fledged PBOs, as shown in Table 5.15. However, there is little alignment between the parent organisation's processes and projects. Also, their organisational structures have not created an alignment between processes within the organisation's different functions and among project-level functions.

The upper managers are responsible for setting up structures that support projects since a structure influences behaviour. The common options for organising projects are well known, from pure project organisations to functional organisations via variations of matrix organisations. Many organisations have attempted to integrate projects into a functional organisation using the matrix approach, in which functional managers control departments and project managers coordinate the work across functions. The major fault is that it represents a marginal change—a mere modification to the old hierarchical organisation. It meant that upper management’s assumptions were based on the functional organisation or mechanistic model. As a result, most behaviour rewarded by upper management has been counterproductive to successful projects. People working in a matrix organisation complained of being caught in a web of conflicting orders, priorities, and reward systems that do not match the stated organisational goals. Furthermore, because the matrix approach represents only a marginal change, the typical problems of bureaucracy often prevail. The weakness of

bureaucracy brings the tenets of the organic organisation into focus (Englund and Graham, 2019:45).

The challenge is to create a system where people enter into relations determined by problems rather than by structure. The building block of such post-bureaucratic organisations is considered to be a team. Consensus on action is reached not by positional power but by influence - the ability to persuade rather than command. The ability to persuade is based on knowledge of the issues, commitment to shared goals, and proven past effectiveness. Each person in the team understands how their performance affects the overall strategy. A common mistake in implementing project management is ignoring the process of developing core teams, to establish a core team for each project composed of a person from each affected department (Englund and Graham, 2019:51).

Human resource

The data and analysis of the study identified 'human resource' as one of the organisational design dimensions of ECFs, as presented in Chapter Five Section 5.2.2, 5.3.1, 5.3.2, 5.3.3, and 5.3.4. 'Human resource' positively correlates with the salient characteristics of full-fledged PBOs (0.479), as shown in Table 5.15. However, the human resource management of the construction firms is not supportive of projects to the expected level, which is noticed by the absence of selected human resources management practices specifically adapted for project-based work. Thus, it is difficult to reconfigure the human resource of construction firms when a new project is commenced and completed. Also, most firms do not have a well-designed process for developing a project manager that includes training, mentoring, and coaching. Also, project members were not provided with sufficient project management training programs.

A project manager selection and development process could not happen without direction and support from upper managers. Perhaps the task could be assigned to an existing department, such as human resources, but this is not recommended unless someone very knowledgeable about project management is in that department. Instead, the recommended approach is for a project management initiative or project office to

see if the program is properly developed, implemented, and staffed to develop a cadre of trained project managers (Englund and Graham, 2019:370).

Behaviour

The data and analysis identified ‘behaviour’ as one of the organisational design dimensions of ECFs, as presented in Chapter 5, Section 5.2.2, 5.3.1, 5.3.2, 5.3.3, and 5.3.4. ‘Behaviour’ positively correlates with salient characteristics of full-fledged PBOs (0.599), as shown in Table 5.15. Communications at projects are not handled appropriately, and the correct information is not reaching the right team member. Project members do not sufficiently understand the expectations of important stakeholders of projects. Upper managers are not entirely dedicated to adopting a project-oriented culture.

Upper managers are often unaware of how their behaviour influences project success or failure. Because previous examinations of project success focussed almost exclusively on the functions of the project manager, there is a lack of awareness of the importance of the project environment and the behaviour of the organisation's middle and higher managers. Properly designed communication among project stakeholders is necessary to allow open and rapid communication (Englund and Graham, 2019:104).

The quantitative analysis results in Section 5.3 showed that the mean scores of strategy, process, structure, human resource, and behaviour are below the average score of 3. The information indicated a gap in the practice of the five organisational design dimensions by the local construction firms. Likewise, the interviews revealed a noticeable practice gap in the five organisational dimensions, as illustrated in Section 5.2. The local construction firms overlook formal strategic plans. Most local construction firms did not have a policy for environmental assessment and strategic plan preparation.

Moreover, local construction firms do not adequately define standard project management processes. As a result, there is little structural alignment between the parent organisation's processes and projects. Also, their structures have not created an alignment between processes within the organisation's different functions and among project-level functions. Again, the human resource management of the local

construction firms is not fully committed to supporting projects shown by the absence of selected human resources management practices specifically adapted for project-based work. There is a lack of awareness of the importance of the project environment and the behaviour of different level managers and members about the organisation's success.

According to the qualitative and quantitative study results, the five core organisational design dimensions (strategy, process, structure, human resource, and behaviour) are verified as fundamental requirements for local ECFs to be transformed into full-fledged PBOs. But there is no indication or evidence that Ethiopian local construction firms embrace those dimensions in their architecture. Therefore, local construction firms should exert a solid effort in these core dimensions to be transformed into full-fledged PBOs.

Based on the research results and the above synthesis and analysis, this research has therefore proved proposition one presented in Chapter 1, Section 1.4, which stated: *"The core dimensions of organisational design are part of the fundamental requirements for local Ethiopian construction firms."*

6.2.2 Proposition Two (P2): "There are key antecedents of organisational design dimensions necessary for Ethiopian construction firms" is the second proposition formulated in Chapter 1, Section 1.4.

The data and analysis of the research have confirmed the antecedents listed below of organisational design dimensions of ECFs as presented in Chapter 5 Section 5.2.2, 5.3.1, 5.3.2, 5.3.3, and 5.3.4 (b). The antecedents listed below were found through the qualitative and quantitative analyses in Chapter 5. The identified antecedents and PBO characteristics addressed in the literature review are labelled as PBOCH.

Project orientation (PBOCH1)

The research data and analysis identified ‘project orientation’ as one of the antecedents of organisational design dimensions of ECFs, as presented in Chapter 5, Sections 5.2.2, 5.3.1, 5.3.2, 5.3.3, and 5.3.4. ‘Project orientation’ positively correlates with strategy, process, structure, human resources, and behaviour, as shown in Table 5.16. However, the construction firms' strategic documents are not prepared to consider projects. Furthermore, the organisations do not seem to recognise the significance of projects. Therefore, projects are not being selected based on their strategic values. Instead, construction firms should deliberately make a strategic decision to be full-fledged PBOs (Turner and Miterev, 2019:488). Giving projects a strategic emphasis is the first move toward creating full-fledged PBOs (Englund and Graham, 2019:91).

A shareholder versus stakeholder orientation

A strategic choice is a decision that determines a firm's future status. The data and analysis of the research have identified ‘shareholder versus stakeholder orientation’ as one of the antecedents of organisational design dimensions of ECFs, as presented in Chapter 5, Section 5.2.2, 5.3.1, 5.3.2, 5.3.3, and 5.3.4. ‘A shareholder versus stakeholder orientation’ positively correlates with process, structure, human resources, and behaviour, as shown in Table 5.16. Shareholders do not monitor the continuous improvement of project members’ performance, which shows not much corporate-level thinking by the shareholders. Manageable levels of standardisation across projects should be exercised (Muller, Pemsel & Shao, 2015:848). Project managers in stakeholder-oriented organisations with an outcome-control approach are less likely to seek help. In contrast, project managers in the shareholder-behaviour control approach are most likely to seek help. They will seek help from their supervisor (the shareholders' representative) (Turner and Muller, 2014:80).

Control by behaviour or results

The research findings have identified ‘control by behaviour or results’ as one of the antecedents of organisational design dimensions of ECFs, as presented in Chapter 5, Sections 5.2.2, 5.3.1, 5.3.2, 5.3.3, and 5.3.4. ‘Control by behaviour or results’ positively

correlates with strategy, process, structure, human resource, and behaviour (at a significant level of 0.05), as shown in Table 5.16. The local construction firms are focused on their current problems to complete projects. The firms do not have a structure to continuously follow up the performance of project members with the rules and procedures of the company. As a result, project managers in organisations controlled by results suffer the greatest temptation to overstate what has been achieved, the end result. In contrast, project managers in organisations controlled by behaviour are more likely to overstate what has been done in the process (Turner and Muller, 2014:80).

Upper management support (PBOCH2)

The data and analysis identified 'upper management support' as one of the antecedents of organisational design dimensions of ECFs, as presented in Chapter 5, Sections 5.2.2, 5.3.1, 5.3.2, 5.3.3, and 5.3.4. 'Upper management support' positively correlates with process, structure, human resources, and behaviour, as shown in Table 5.16. However, there is a lack of support for projects in the implementation phase by upper management. Upper managers are mainly reluctant to provide feedback in project reports. As a result, upper managers are not positively influencing the behaviour of project members. There is also a communication gap between upper management and project managers. Upper managers might emphasise the value of projects to the organisation and yet undermine and ignore projects during the actual project implementation phase. This trend should be changed for organisations to be transformed into full-fledged PBOs. Upper management must work on different issues to enable a thriving project environment. They must realise the need to change behaviour to accommodate the uncertainty inherent in project contexts, play supportive roles to make planning a regular part of the project management process, and support focussing on single-tasking rather than multitasking to improve efficiency (Englund and Graham, 2019:203).

Development of Competent Project Managers (PBOCH3)

The research findings identified ‘competency of project managers’ as one of the antecedents of organisational design dimensions of ECFs, as presented in Chapter 5, Sections 5.2.2, 5.3.1, 5.3.2, 5.3.3, and 5.3.4. ‘Competency of project managers’ positively correlates with process, structure, and behaviour, as shown in Table 5.16. Construction firms do not have adequate processes for selecting and developing project managers. As a result, the project managers are not trusted. Moreover, project managers lack sufficient management knowledge, particularly project management knowledge. As a result, the organisation's project managers do not possess the necessary leadership qualities. Project managers do not adequately handle changes in projects. However, an uncertain project management environment requires project managers to adapt to circumstances and deal with them (Englund and Bucero, 2013:1). Consequently, managers need a combination of leadership, technical, strategic, and business management skills, as outlined in the PMI Talent Triangle for building competence (Englund and Graham, 2019:349).

Awareness and knowledge of project management (PBOCH4)

The data and analysis identified ‘awareness and knowledge of project management’ as one of the antecedents of organisational design dimensions of ECFs, as presented in Chapter 5, Sections 5.2.2, 5.3.1, 5.3.2, 5.3.3, and 5.3.4. ‘Awareness and knowledge of project management’ positively correlates with process and behaviour, as shown in Table 5.16. There is a lack of awareness and knowledge of project management at the parent organisation and project levels. The project members do not understand the value and nature of projects to the expected level. Traditional project management is often performed through intuition and personal experience.

In most cases, individuals are appointed as project managers because they have qualifications in the same or similar fields as the project’s core business, for example, construction, power, information technology, and engineering(Rwelamila & Ssegawa, 2014:212). But the technical understanding of a project manager is not an overriding indicator of effectiveness. It provides increased reliability on the job for the core

business of the project but, most often, is elevated in significance beyond what it deserves. For example, Nigerian studies conducted on four sectors, including construction, showed only about 50% of the project managers know how to project manage by combining the three metrics (Experience, Certification, and Exposure) (Izang, Kuyoro, Ogbonna & Omotunde, 2015:182). Another study by Rwelamila and Purushottam (2012:5) depicted, on average, eight out of ten project managers in Africa are accidental or have inadequate knowledge of project management. The commonly agreed factors contributing to competence are knowledge acquisition, skills, experience, and continuous professional development. Therefore, knowledge acquisition is an essential building block for developing competent project managers. Acquisition of knowledge is a combination of an appropriate body of knowledge (BoK), pedagogy, a conducive and well-endowed training environment, and a correct disposition of attitude by the trainee. Project management (BoK) can be acquired through training on the job, short courses, and professional and tertiary institutions (Rwelamila & Ssegawa, 2014:213).

Project-based working (PBOCH5)

The research data and analysis identified 'project working' as one of the antecedents of organisational design dimensions of ECFs, as presented in Chapter 5, Sections 5.2.2, 5.3.1, 5.3.2, 5.3.3, and 5.3.4. 'Project working' positively correlates with strategy, process, structure, human resources, and behaviour, as shown in Table 5.16. However, the upper management does not design project work processes well, including standard project management knowledge areas. Project, program, and portfolio are established vehicles for managing strategic change to be project-oriented (Geraldi, Teerikangas, Birollo, 2022:439). However, standard project, program, and portfolio management processes are not sufficiently incorporated in the design of project activities. Also, organisation and project works are not correctly aligned.

At PBOs, project-based working is the core business process that should be adopted (Miterev, Turner & Mancini , 2017a:485). The processes in the PBOs should involve winning the customer's order, designing the product and the process of its delivery,

producing the components of the product, configuring the components of the product, commissioning the product, and delivering it to the customer; while maintaining customer support after delivery (Turner and Keegan, 2000:134).

Strategic project management information system (PBOCH6)

The data and analysis have identified a 'strategic project management information system' as one of the antecedents of organisational design dimensions of ECFs, as presented in Chapter 5, Section 5.2.2, 5.3.1, 5.3.2, 5.3.3, and 5.3.4. A 'Strategic project management information system' positively correlates with strategy, process, structure, human resources, and behaviour, as shown in Table 5.16. However, most construction firms do not have a project management information system. Project stakeholders' information is not adequately shared among project members. Their project systems do not support organisational learning. As a result, upper managers do not value an organisational-wide project management information system.

The findings are that the high-quality and flexible processes of a PBO depend on fact-of-the-art project management information systems (PMIS) (Abrantes & Figueiredo, 2021:369). However, standard information systems have not yet been designed for projects; they only inform managers whether they are on a budget and are unsuitable for analysing the effect of staff changes, proposed priority changes, or changes on other projects. A PMIS provides real-time information on project activity progress, current project costs; current and projected human resources application; projected release dates; and specifications and changes. One of the benefits of PMIS at PBOs is improving the estimating process in tendering. In addition, the costing approach could be improved by developing a database (Englund and Graham, 2019:300).

An appropriate PMIS does the following: answers questions of major stakeholders; facilitates communication among team members, between team members and stakeholders, among all project managers, and between project managers and upper managers; helps in "what-if" analyses to answer questions about project staffing, proposed staffing changes, and total allocation of resources; helps organisational

learning by helping the members of the organisation learn about project management. An effective PMIS cuts across organisational lines and develops information to be used as a basis for decision-making (Englund and Graham, 2019:302).

Projects churn (PBOCH7)

The research findings have identified 'churn' as one of the antecedents of organisational design dimensions of ECFs, as presented in Chapter 5, Sections 5.2.2, 5.3.1, 5.3.2, 5.3.3, and 5.3.4. 'Churn' positively correlates with 'human resources' element, as shown in Table 5.16. It was found that project members were not satisfied with the project work procedures. There are no well-designed motivational schemes for project staff to be transferred to other projects. This churn that project-based working implies requires organisations to adopt human resource management approaches that reflect churn (Miterev, Turner & Mancini , 2017a:485).

Project core team (PBOCH8)

The data and analysis findings have identified the 'project core team' as one of the antecedents of organisational design dimensions of ECFs, as presented in Chapter 5, Sections 5.2.2, 5.3.1, 5.3.2, 5.3.3, and 5.3.4. 'Project core team' positively correlates with process, structure, human resources, and behaviour, as shown in Table 5.16. However, the project setups are not conducive to executing tasks. For example, formal project core teams with members from different departments are not created to execute project works. Furthermore, upper managers do not seem to understand the value of project core teams.

When producing repeat products, most organisations are segmented into departments for economies of scale. But, the departmental structure is inadequate for producing new products or services. A common mistake in implementing project management is ignoring the process of developing core teams to establish a core team for each project composed of a person from each affected department. Core team process implementation requires a long-run view of projects only upper managers can access. Projects cannot have the required priority unless upper managers support the core team

concept by defining project priorities (Englund and Graham, 2019:223). The project manager is usually told to plan the project or get started. Only then are people brought on board to accomplish the project work (Englund and Graham, 2019:211). Current projects with a dynamic and turbulent nature have needs beyond the solutions provided by the standard traditional options(Kahkonen, Keinanen & Naaranoja, 2013:369).

Project culture (PBOCH9)

The research findings identified 'project culture' as one of the antecedents of organisational design dimensions of ECFs, as presented in Chapter 5, Sections 5.2.2, 5.3.1, 5.3.2, 5.3.3, and 5.3.4. 'Project culture' positively correlates with strategy, process, structure, human resources, and behaviour, as shown in Table 5.16. Organisations face difficulty adapting to changes when commencing new projects. Project members are also not ready to accept new innovative systems for their projects. There is a culture of rushing into project work without proper planning. The high project turnover has been an obstacle for the organisation in developing its identity. The company using strategic decision-making to be project-oriented must adopt a project-oriented culture by addressing the balance between project and functional managers and appropriately rewarding project managers for their contribution toward the bottom line. Line and project managers must adopt appropriate behaviour (Miterev, Turner & Mancini , 2017a:486-487).

Uncertainty, dynamism and complexity

An organisation works in the context of its internal and external environment. The data and analysis research identified 'uncertainty, dynamism, and complexity' as one of the antecedents of organisational design dimensions of ECFs, as presented in Chapter 5, Sections 5.2.2, 5.3.1, 5.3.2, 5.3.3, and 5.3.4. 'Uncertainty, dynamism, and complexity' positively correlate with process and behaviour, as shown in Table 5.16. The project owner's interests are changing more frequently. The construction firms use the country's current economic instability to avoid long-term planning. For project managers, uncertainty is experienced as an inevitable gap between the amount of information and knowledge required for decision-making and what is available. Complexity is recognised

as a key contingent variable that impacts many subsequent decisions in managing projects. Dynamics refers to changes in projects, such as changes in specifications, management teams, suppliers, or the environmental context (Geraldi *et al.*, 2011:21).

History and context of the organisation, including its leadership

The research findings have identified 'History and context of the organisation, including its leadership' as one of the important antecedents of organisational design dimensions of ECFs, as presented in Chapter 5, Sections 5.2.2, 5.3.1, 5.3.2, 5.3.3, and 5.3.4. 'History and context of the organisation, including its leadership' positively correlated with strategy, process, structure, human resources, and behaviour dimensions, as shown in Table 5.16. Autonomy is not given to the upper-level managers by the shareholders. The majority of the shareholders of the organisation have not set a long-term vision and plan. There is a scarcity of ethical professionals in the market. There is evident unfairness in the bidding approaches and procedures in the Ethiopian construction industry. The 'history and context of the organisation, including its leadership', is one of the antecedents that influence the choice of design configuration (Turner and Miterev, 2019:493).

Size

The data and analysis of the research have identified 'size' as one of the antecedents of organisational design dimensions of ECFs, as presented in Chapter 5, Sections 5.2.2, 5.3.1, 5.3.2, 5.3.3, and 5.3.4. 'Size' positively correlates with strategy, process, structure, human resources, and behaviour, as shown in Table 5.16. Local construction firms are not competitive in bigger-sized projects. The organisational structures of projects are not considering the size of the projects. Project execution plans in the organisation are not being prepared depending on the size of the projects. Size is an important contingency variable affecting an organisation's design. Smaller firms are less likely to employ dedicated project managers, so in SMEs, particularly micro-sized firms, projects will be managed by people for whom project management is not their primary skill (Miterev, Turner & Mancini , 2017a: 495).

Fit

The data and analysis of the research have identified ‘Fit’ as one of the antecedents of organisational design dimensions of ECFs, as presented in Chapter 5 Sections 5.2.2, 5.3.1, 5.3.2, 5.3.3, and 5.3.4. ‘Fit’ positively correlates with strategy, process, structure, human resources, and behaviour, as shown in Table 5.16. However, the organisational structures of construction firms are not aligned with the strategy. Also, the actual work processes do not match the designed organisational structure of the firms. The absence of clearly defined processes at the construction firms has made it challenging to bring behavioural improvements at project levels. The performance of an organisational unit's performance results from the alignment between its external context and internal arrangement (Van De Ven, Ganco & Hinnings, 2013:424; Miterev, Turner & Mancini, 2017a:536). In PBOs, the organisation structure should create a fit between the decision to be project-oriented and the processes adopted, between processes projects and in the line, between processes in different functions, and between the context and processes adopted (Miterev, Turner & Mancini , 2017b:486).

Dynamic capability and organisational learning

The research findings have identified ‘dynamic capability and organisational learning’ as one of the antecedents of organisational design dimensions of ECFs, as presented in Chapter 5, Sections 5.2.2, 5.3.1, 5.3.2, 5.3.3, and 5.3.4. ‘Dynamic capability and organisational learning’ positively correlate with process, structure, and behaviour, as shown in Table 5.16. However, there is apparent resistance to managing projects with innovative methodologies. New work methods are not much cherished for performing project tasks. Hence, the resistance to change is due to fear of failure.

PBOs have become a widespread form of organisation suited to deal with dynamic and unstable environments (Melkonian & Picq, 2011:455; Abrantes & Figueiredo, 2013:757). PBOs need to be flexible and capable of adapting their processes and structures to the evolving context. Being prepared for change allows the firms to take advantage of change events as opportunities, evolve, and improve process maturity and supporting infrastructures. The speed and effectiveness with which PBOs can seize changes are

critical to their success (Abrantes & Figueiredo, 2013:757). A PBO with such an approach combines both aspects of change: the hard (processes, procedures, and information systems) and the soft (employee motivation, communication, and leadership) to successfully change into a future organisation enabling the organisation to dynamically respond to change triggers (Abrantes and Figueiredo, 2013:764).

Among the above confirmed sixteen antecedents of organizational design dimensions of full-fledged PBOs, the research findings indicated six new antecedents: i) awareness and knowledge of project management, ii) project core team, iii) strategic project management information system; iv) upper management support, v) dynamic capability and organisational learning, and vi) competency of project managers.

The mean scores of the antecedents for the organisational design dimensions of Ethiopian local construction firms (questionnaire results) are below the average of 3, as presented in Section 5.3. It showed a clear gap in the practice of antecedents of organisational designs necessary for Ethiopian local construction firms. In addition, the face-to-face interview results in Section 5.2 earlier revealed this gap of not being amalgamated in the organisational design of local construction firms. These included the generic antecedents of organisational design and the specific antecedents of PBOs (PBO characteristics).

According to the qualitative and quantitative study results, the sixteen antecedents of organisational design dimensions necessary for ECFs to be transformed into full-fledged PBOs are confirmed to be key antecedents of organisational design dimensions. There is a noticeable gap in the local ECFs assimilating the antecedents in their organisational designs.

Based on the qualitative and quantitative analysis results, this research *has proven* proposition two, as presented in Chapter 1, Section 1.4: *"There are key antecedents of organisational design dimensions necessary for Ethiopian construction firms."*

6.2.3 Proposition Three (P3): "A conceptual model doesn't exist for transforming Ethiopian construction companies into full-fledged PBOs" is the third proposition formulated in Chapter 1, Section 1.4.

A conceptual model (CM) is a network, or "a plane," of interlinked concepts that together provide a complete understanding of a phenomenon or phenomena (Jabareen, 2009:51). Predominantly, organisational models are presented as a set of components of a system, process, or subject area developed for understanding, analysing, improving or the replacement of processes (Stanford, 2007:20).

Organisations in dynamic industries, including construction firms, must be organically organised to deal with their uncertain environment. A Project-based organisation (PBO), including construction firms, is a unique organisational form suitable for implementing and managing business activities around projects. Research into the PBO organisational design is based on a limited empirical foundation (Turner & Miterev, 2019:489). It created the need for a contextualized PBO model. This study revealed the key drivers or components that would help to design the invaluable transformational PBO model for ECFs.

The components required for building the CM for transforming ECFs into full-fledged PBOs were ignored or overlooked. Through an extensive literature review on project management and organisational design, a research CM was designed in Chapter 3, Figure 3.12. Then qualitative and quantitative studies were done sequentially. The results and synthesis of the study (Chapters 5 and 6) allowed finding the different components required to build the CM to transform ECFs into full-fledged PBOs. The identified components are the core organisational design dimensions of full-fledged PBOs and their key antecedents.

Accordingly, the third proposition of this study presented in Chapter 1, Section 1:4, stated: *"A conceptual model does not exist for transforming Ethiopian construction companies into full-fledged PBOs"* is confirmed due to the discovery of new components and their relationships for building the CM.

6.3 Implication of 'Proving/Disproving' Propositions

A proposition is a theoretical statement that two or more factors or concepts are related and what type of relationship it is. A major purpose of the research is to determine whether a theory's proposition conforms to the empirical evidence or data (Neuman, 2014:68). The research CM of the study is designed based on the "Modified Star Model" discussed in Chapter 3. Three propositions originated from this research CM.

The components for building the CM for transforming ECFs into full-fledged PBOs were not identified at the beginning of the study. However, the "proving/ disproving" of the propositions enabled confirmation of what is lacking in the current construct of most ECFs and the identification of missing building blocks for the proposed CM. The identified components (or building blocks) are core dimensions of the organisational design of local ECFs and their key antecedents. Therefore "Proving/disproving" the propositions formulated in Chapter 1, Section 1.4 implies opening the door to developing the CM to transform ECFs into full-fledged PBOs.

6.4 Chapter Summary

The first research proposition of this study formulated in Chapter 1, Section 1.4 is: “The core dimensions of organisational design are parts of the fundamentals requirements for local Ethiopian construction firms”. The research proved through subsections 5.2.2; 5.3.1; 5.4.2; 5.3.3, and 5.3.4 and then synthesised in subsection 6.2.1 that there are core dimensions of organisational design, which are part of the fundamental requirements for local ECFs to be full-fledged PBOs. It is these core organisational design dimensions that could help ECFs become transformed into full-fledged PBOs.

The second research proposition of this study formulated in Chapter 1, Section 1.4 is: “There are key antecedents of organisational design dimensions necessary for Ethiopian construction firms.” This research proved in subsections 5.2.2; 5.3.1; 5.4.2; 5.3.3, and 5.3.4 and then synthesised in sections 6.2.2 that key antecedents of organisational design dimensions are necessary for local ECFs. Moreover, those key antecedents are associated with the organisational design dimensions of ECFs. Also, the organisational design dimensions are related to the salient characteristics of full-fledged PBOs. These enabled verifying the third proposition of this study formulated in Chapter 1, Section 1.4: “A conceptual model does not exist for transforming Ethiopian construction companies into full-fledged PBOs”. In summary, “Proving/disproving” the propositions in this chapter have charted how to design the CM to transform ECFs into full-fledged PBOs.

The next chapter will discuss details of the CM, how to use it, and its contribution to the body of knowledge.

CHAPTER 7:

MODEL DEVELOPMENT AND VALIDATION

7.1 Introduction

The main objective of this study is to develop a conceptual model (CM) to help Ethiopian construction firms trapped within different problems to be transformed into full-fledged Project-based organisations (PBOs). Developing models for problem-solving is a common practice in many disciplines. Furthermore, model formulation is a complex process. Therefore, it is imperative to understand models and conceptual models before commencing a conceptual model development. In Chapter 2, model development was discussed in detail, mainly on how CMs could be developed. Next, Chapter 3 focused on the theory and practices of PBOs. Then, the methodological stance for the study was addressed in Chapter 4. Finally, the study results were presented in Chapter 5, and Chapter 6 covered the analysis and synthesis of the results.

This chapter deals with CM development and how to use the model. The model development considers information collected through literature reviews, Interviews and survey research findings analysis and synthesis from the results. Section 7.2 discusses the architecture of the proposed conceptual model (CM). Compliance of the proposed model to model building criteria is addressed in Section 7.3, and Section 7.4 contains the validation and evaluation of the developed CM. A discussion on how the model could transform Ethiopian construction firms (ECFs) into full-fledged PBOs is covered in Section 7.5. In Section 7.6, the contribution of the proposed CM to the body of knowledge is discussed. This chapter links the data from the field research to existing knowledge and literature as a mechanism for identifying and highlighting new insights for the design of ECFs.

7.2 A Conceptual Model for the Transformation of Ethiopian Construction Firms into Full-fledged PBOs

Modelling provides a logical, abstract or template to facilitate analytical reasoning. As mentioned before, a CM is a network, or “a plane,” of interlinked concepts that together provide a comprehensive understanding of a phenomenon or phenomena (Jabareen, 2009:51). The salient building blocks used for CM development, including foundational thoughts, are the aspects to be considered in the model development. Procedures to be followed in building the model were discussed in Chapter 2. The findings and synthesis of the study have brought additional components besides confirming the antecedents previously identified by the study's theoretical model, the Modified Star Model.

The proposed model is developed with components discovered in the research findings and synthesis, as illustrated in Figure 7.1. The model enables CEOs and other top management members of ECFs to design their organisations into full-fledged PBOs. It could also help the construction industry policymakers, and regulatory bodies focused on strengthening construction firms as central players in implementing various development projects.

Organisational models are expressed as representing a set of components or a process, system, or subject area typically developed to understand, analyse, improve or replace processes (Stanford, 2007:20). The organisational design started with assessing the PBO internal and external environment, strategic documents and other characteristics (PBOCHs). The proposed model illustrated that efforts by ECFs to assimilate the unique PBOCHs within their organisational designs would enable them to transform into full-fledged PBOs. The relationship among the antecedents, organisational design dimensions, and full-fledged PBOs is indicated by arrows in Figure 7.1. The additional components contributed through this study are shown distinctly in the proposed model.

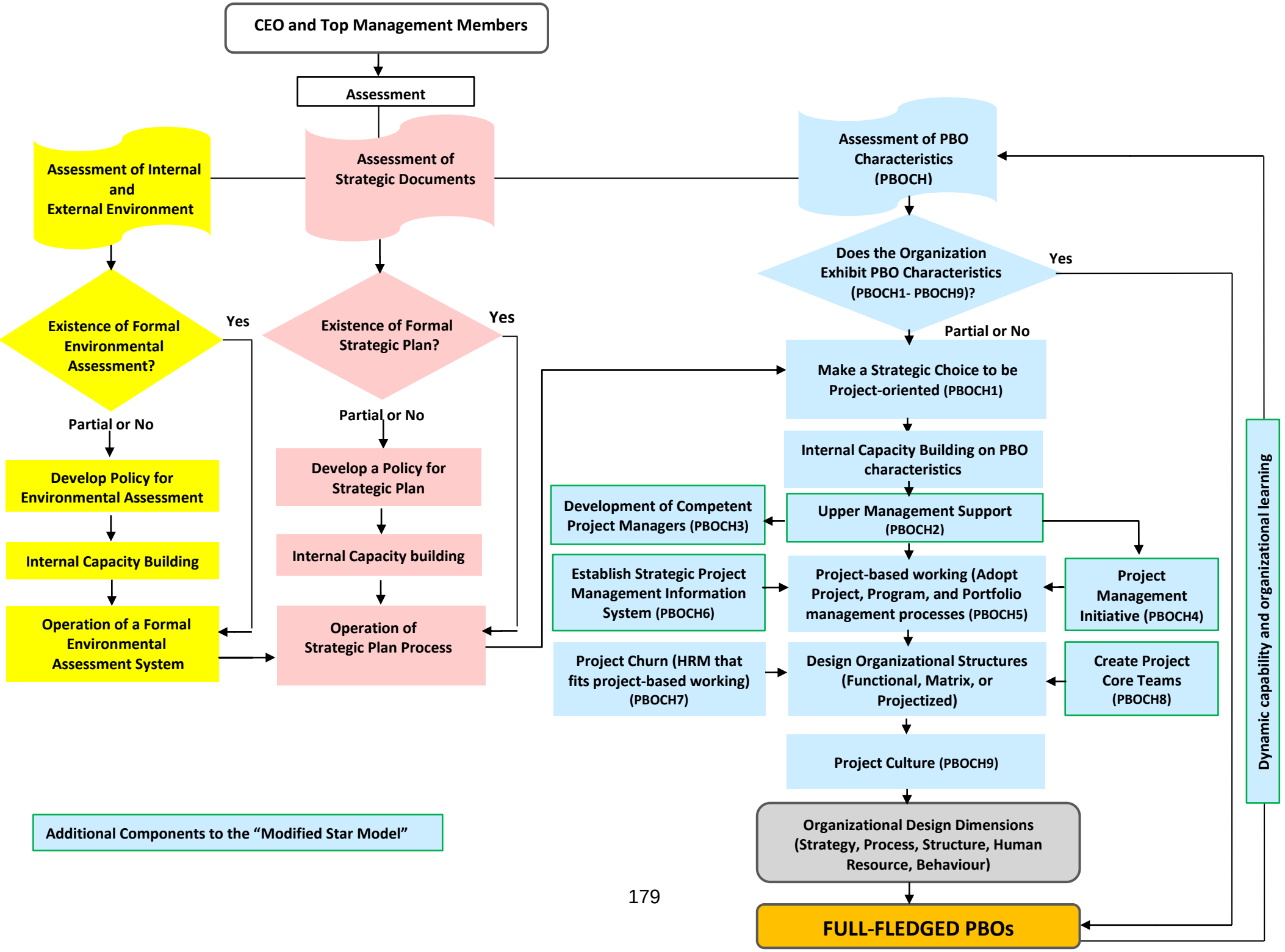

Figure 7.1: A Conceptual Model for the Transformation of ECFs into full-fledged PBOs

7.3 Compliance with Model Building Criteria

A conceptual model (CM) systemically addressed six questions: Why, What, How, Who, Where, and When (Whetten,1989:490). Table 7.1 discusses the criteria and evaluates the proposed CM compared to the model-building criteria.

Table 7.1 Compliance with Model Building Criteria

Question	Description	Compliance with model-building criteria
What	Which factors (variables, constructs and concepts) should be considered to explain the phenomena of interest? Two criteria exist for judging the extent to which we have included the "right" factors: comprehensiveness (i.e., Are all the relevant factors included? and Should some factors be deleted because they add little additional value to understanding?)	Sections 3.4.1 and 3.4.2 of Chapter 3 and Sections 6.2.1 and 6.2.2 of Chapter 6 discussed the different organisational design dimensions and their antecedents to transform ECFs into full-fledged PBOs. Those components were used to build the conceptual model.
How	How are the different elements of the model related? Arrows connect the boxes, showing the relationships between different antecedents.	Arrows indicate the relationship between antecedents of organisational design and organisational design dimensions, as depicted in Figure 7.1. Another arrow showed that effort in using the different organisational design dimensions could turn construction firms into full-fledged PBOs.
Why	What underlying reasons justify the selection of factors and the proposed causal relationships?	The literature review on PBOs, the information collected through the interview and survey, and the analysis and synthesis in Chapters 5 & 6 are the underlying reasons why the specific antecedents and organisational design dimensions are included in the model development.
Where, Who, and When	These conditions set boundaries for the model to prove its generalizability. The key question is, “Will the model hold in other jurisdictions and across different periods?”	The proposed model could be used when designing ECFs. Even if the model is developed for the Ethiopian context, it could still apply to other emerging economies within similar contexts.

Source: Whetten (1989) supplemented by the author

The last column in Table 7.1 indicates how each criterion was met in developing the CM. Since the model development process adheres to the model-building criteria as illustrated in Table 7.1, the next task would be to validate and evaluate the model for its; completeness, consistency, coherence, unambiguity, and correctness (Cherfi, Akoka & Comyn-Wattiau, 2002:416).

7.4 Model Validation and Evaluation

Model validation and evaluation could answer whether a proposed model and its concepts make sense to practitioners and scholars. Presenting a CM at a conference, seminar, or another academic framework provides an excellent opportunity for researchers to discuss and get feedback (Jabareen, 2009:54). Model validation and evaluation were among the different phases of the conceptual model development process explained in Chapter 2.

Accordingly, this study was presented at the 14th International Conference on Project Management (ProMAC 2021) held in Kumamoto, Japan, on November 25-26, 2021 (see Appendix VII), and at the 1st International Engaged Scholarship Conference 2022 on Africa Continental Free Trade Area (UNISA-SBL) held in Midrand, South Africa, on August 14-16, 2022. The feedback received was used to improve the model. The proposed model was also discussed with CEOs and other practitioners in the Ethiopian construction industry (ECI), and their feedback was incorporated. Table 7.2 focuses on the compliance of the proposed transformation model to model validation criteria.

Table 7.2: Model Validation

Model Validation Criteria	Compliance with model Validation Criteria
Completeness: a conceptual model should include all possible significant factors or elements that affect the phenomenon. It should ensure that one or more requirements cover all needs, constraints, and policies.	The proposed model is an extension of an existing model, the Modified Star model. Those antecedents and organisational dimensions previously identified in the Modified Star model were verified and included in the model development process. Additional new antecedents that emerged from this study were also included.
Consistency: processes within the conceptual model need to be consistent with one another and consistent with the empirical data. Any model that is inconsistent with the primary empirical data or which cannot be reproduced must be either modified or rejected.	Antecedents were added to the model, such as the project core team and strategic project management information system linked with one another and the other previously identified antecedents, as shown in Figure 7.1. The model was developed from information obtained from respondents through semi-structured interviews and survey data collected from stakeholders within the ECI. The model is thus consistent with the underlying empirical data.
Coherent: it should be organised in such a way that all elements of the model are logical.	As shown in Figure 7.1**,** all the model components were arranged logically to support the intended outcome; a model developed for transforming construction firms into full-fledged PBOs.
Correctness: the model should be the right fit for the intended application and have the potential to address the identified gaps.	The model addresses the internal capacity problem of Ethiopian construction firms (ECFs) discussed in Chapters 1 and 3. The organisational design dimensions and their antecedents were identified to help construction firms transform themselves into full-fledged PBOs.
Complexity: the model cannot be too complex to ensure ease of use and implementation in a real-world environment.	The model is presented in a user-friendly and visually appealing format. The proposed model consists of three focus areas: environmental assessment, strategic planning, and assimilation of PBO characteristics. As a result, the model is easily understandable and can be used by construction firms for designing their organisations.
Transparency: The model should be transparent, making the conclusions of the model more understandable and applicable to the real world.	The model's components are explained in simple terms in sections 6.2.1 and 6.2.2, and their relationships are clear for ease of applicability.
Decision-making: a model should be oriented to support the process of decision-making.	The model would help construction firms to decide on the organisational design dimensions of their firms. These include making their organisations project-oriented, strategic decisions to design a project management information system, and others.
Explainability: The model needs to be easily explainable (model legitimization) to ensure the general acceptability of the model.	The model is developed based on the existing Modified Star model based on the well-established Star Model. The components added to the existing model were identified and linked with other model components. These features of the model have made it easily explainable and acceptable.

Source: Remenyi *et al.* (1998), Schmenner *et al.* (2009) supplemented by the author

7.5 Working with the Conceptual Model

This section discusses how the proposed model (Figure 7.1) could be used to design and consequently transform Ethiopian construction firms (ECFs) into full-fledged PBOs. To assess if a firm is a full-fledged PBO, the CEO and top-level managers should pass through the three phases illustrated in the proposed model (Figure 7.1).

Phase I
Assessment of Internal and External Environment (AIE)

As indicated in the proposed model (Figure 7.1), construction firms should start the organisational design work with an internal and external environmental assessment (AIE). The internal environment analysis covers the organisation's strengths and weaknesses. Furthermore, the external environmental assessment serves as an inventory of the political, economic, social, and technological forces that influence the mission and goals of an organisation and how they function. AIE gives a complete picture of the current situation of the organisations for subsequent strategic measures.

AIE of construction firms focuses on the history and context of the organisations and their leadership; the size of the firms, the size of projects, the number of employees; uncertainty, dynamics, and complexity. The current macroeconomic and construction regulatory framework uncertainties need to be studied carefully. Knowledge about the complexity of projects in the firms would help craft matching strategies like outsourcing.

The first question that needs an answer regarding AIE is: Does the organisation have an established process for doing AIE? If the answer is yes, the firm must have a policy for AIE, and the AIE process is already in place, moving to Phase II. But if the answer is ‘partially’ or ‘no’, it is necessary to formalise a full-fledged system of AIE. The process starts with formulating an AIE policy. Capacity building is also required for the organisation members to understand why it is vital to carry out AIE. When the AIE policy and the related capacity-building programs are put together within the organisation, the AIE process will be in place. Hence move to Phase II. ECFs should initially ensure that

the AIE process is in place within their organisations as part of their endeavour to be transformed into full-fledged PBOs.

Phase II
Assessment of Strategic Documents (ASD)

In Phase II, the assessment of strategic documents (ASD) is the main focus. Strategies are long-term guidelines for an organisation as whole or significant sections of it. A strategy aims to ensure the achievement of the organisation's overriding goals. These strategic guidelines can only produce the desired effects if communicated effectively. Therefore, strategic documents are vital for communicating the strategy of an organisation. The first question that needs an answer regarding ASD is: Does the organisation have an established process for preparing strategic documents? If the answer is yes, it must have a policy for ASD, and the ASD process is already in place within the organisation. Hence move to Phase III.

But if the answer is ‘partially’ or ‘no’, it is necessary to formalise a fully-fledged ASD system. It starts with formulating the ASD policy. Then, capacity-building for organisation members on strategic documents and their preparation would be vital. When the ASD policy and the related capacity-building are put together within the organisation, the ASD process is in place. Hence move to Phase III. At the end of this phase, ECFs should have a formal working strategic plan.

Phase III
Assessment of PBO Characteristics (APBOC)

The future growth of most organisations originates from development projects that generate new services, products, or procedures. Also, projects are primary ways of creating organisational change. Usually, the implementation of growth and change strategies is entrusted only to the project manager. But project success is often as much a result of an organisational environment as the skills of a project manager. Organisations striving to create a favourable environment for projects face difficulty with their existing setup. Project-based organisations (PBOs) are organisational forms that

could respond to this fundamental problem. PBOs are praised for their capacity to address changing customer demands, integrate diverse knowledge sets and innovation, bypass barriers to organisational change, and deliver complex tasks.

Different organisations try to initiate the change to a PBO by sending project managers on training. This led to frustration as the trained managers found that they could not practice their skills in the current organisational environment. The second problem is that the non-repetitive project environment would now be strange to the long-term organisation members. A successful project environment involves the whole organisation, not just the structures created for project management.

Construction firms are PBOs and thus should strongly exhibit the fundamental characteristics of PBOs – PBOCHs. Through a substantial exhibition of PBOCHs, these firms will have the chance to compete with other PBOs with a substantial exhibition of PBOCHs. The Ethiopian construction firms (ECF) are no exception here, as already argued in previous chapters, based on the literature review (Chapter 3) and field study results (Chapters 5 & 6). For ECF to be transformed into full-fledged PBOs and create a favourable environment for successful projects, Phase III focuses on assessing any construction firm to establish if it exhibits strong PBO characteristics (PBOCHs). The first question that requires an answer regarding PBOCHs is: Does the organisation exhibit PBO Characteristics? If the answer is yes, it must have a policy on the importance of PBOCHs and their assimilation within the firm, and PBOCHs which strongly define the respective firm.

But suppose the answer is ‘partial exhibition’ or ‘no exhibition’ of PBOCHs. In that case, it is necessary to formalise a full-fledged system for capacity building on PBOCHs. The respective construction firm must ensure that all understand why it is vital to embrace PBOCHs and their importance for the respective firm. Next, the PBO characteristics (PBOCHs) are discussed briefly to put into context their importance without extensively repeating what is already discussed in detail in Chapter 3.

Project Orientation (PBOCH1): A strategic decision should be made to link the selection of projects with the strategy of the firms. Project members would be curious to know if their project results from strategic intent, not accidental. After making the strategic decision to be project-oriented, construction firms must build internal capacity on PBO characteristics. It would help members of the firms understand and quickly assimilate PBO characteristics in their organisations.

Upper Management Support (PBOCH2): Upper managers should exert strong leadership in articulating a vision for the organisational strategy, linking projects to the vision, and then serving the values of project managers to achieve project goals. A successful upper manager provides adequate staffing to projects, supports the project planning process, launches project management initiatives, establishes project core teams, and develops an organisational reward system that motivates work on projects.

Development of Competent Project Managers (PBOCH3): Competent project managers must master business, behavioural, organisational, and technical skills. The upper managers need to deliver a system that nominates and develops those people with the potential to manage projects. The dominance of competent project managers would end the era of accidental project managers. Developing competent project managers requires a conscientiously planned program of selection and development.

Awareness and Knowledge of Project Management (PBOCH4): Project management initiative guides the development of project management practices in construction firms. A project management curriculum needs to be crafted by this initiative to create an awareness and knowledge of project management at all levels of the organisations.

Project-based working (PBOCH5): Construction firms must adopt project-based working as their primary business process. Project-based working delivers tailored or bespoke products or services to its customers. For this purpose, the firms should define project, program, and portfolio management as business processes.

Strategic Project Management Information System (PBOCH6): Firms should strategically design and implement a project management information system. For this purpose, the scope and type of information required by project stakeholders need to be studied first. Then, customised software solutions could be used to plan, schedule, implement, control, report, communicate, forecast, review, and handle the cost aspects of a project.

Project Churn (PBOCH7): Firms should have a human resource management that recognises and adapts to the expected churn created by constant remapping of projects, programs, portfolios, and the people working on them. The human resource management of the firms should consider the expected high stress on project members due to the constant repositioning.

Project Core Team (PBOCH8): The upper management team should set up structures to support project-based working. For this purpose, a formal project core team must be established for every project composed of a person from each affected department. Project core teams should be formed at the start of a project and stay until the end. The core teams need to be empowered to make decisions about projects.

Project Culture (PBOCH9):

Construction firms need to adopt a project culture so that behaviour in the firms reflects project-based working. In classically managed organisations, the functional hierarchy is the governance structure for internal transactions, but in PBOs, a project is the governance structure for external and internal transactions. Temporary projects could damage cohesion and may not define the culture of the organisations. Cohesion and culture are expected to be provided by the functional organisations, but top management must recognise that project and program management are the primary adopted business processes. The firms that make the strategic decision to be project-oriented must adopt a project-oriented culture by addressing the balance between project and functional managers, rewarding project managers for their contribution toward the bottom line.

Firms must be flexible and capable of adapting to processes and structures in the evolving context. After Phase 3, the construction firms will be in a position to become fully-fledged PBOs. The journey of consolidating processes and changing methodologies to embrace PBOCHs depends on change management thrust within the respective construction firm.

7.6 Contribution of the Study to the Body of Knowledge

This section discusses the contribution of the study to the body of knowledge. Most previous studies on Ethiopian Construction Firms (ECFs) were too focused on the challenges and problems in firms. Other studies tried to search for solutions but with a temporary and disintegrated approach. The studies did not bring a “surgical” and holistic solution. This study focused on searching for a solution to the organisational design problems of firms.

Theoretical Contribution

The study aimed to provide basic knowledge of an organic design approach to transform construction firms into full-fledged Project-based organisations (PBOs). Adopting the contingency perspective, the study explored key antecedents influencing the design of a PBO. The study can be viewed as an interdisciplinary study involving project management and organisational design.

The newly identified antecedents necessary for designing ECFs from project management literature have contributed to extending the existing body of knowledge on the organisational design of PBOs. Another contribution is the confirmed relationships between organisational design dimensions and their antecedents between organisational design dimensions and full-fledged PBOs.

Practical and Contextual Contribution

The study provides construction firms, project owners, policymakers, regulatory bodies, and other stakeholders of the ECI with a reference framework for designing construction firms. The CEOs and other top managers of ECFs could scrutinize various elements of

organisational design relevant to their firms and pay close attention to whether those elements align with each other and the organisational environment. In addition, stakeholders could develop different related policies and strategies on the components developed from the model to build the capacity of ECFs.

Methodological Contribution

The theoretical framework of this study, the Modified Star Model, was developed through a structured framework-based literature review approach. However, the broad emerging research on the design of PBO needs a more theoretical and methodological approach. Therefore, in line with the contingency perspective, this study empirically addressed design choices and contextual characteristics of PBOs with a mixed research design (QUAL-quant).

7.7 Chapter Summary

The developed holistic CM in this chapter amalgamated new antecedents into the initial research CM portrayed in Chapter 3. The proposed model with the components found in the research findings and synthesis is shown in Figure 7.1. Furthermore, the model incorporated different characteristics of PBOs (PBOCHs) from project management literature verified with the empirical findings.

The model's compliance with model-building criteria and its validation and evaluation was addressed in this chapter. In addition, a section on how to apply the proposed CM was incorporated to ensure a clear understanding of the design phases. Finally, the contribution of this study to the existing body of knowledge was also presented. It encompassed theoretical, practical and contextual, and methodological contributions.

CHAPTER 8: CONCLUSIONS AND RECOMMENDATIONS

8.1 Introduction

Ethiopian construction firms (ECFs) face fierce competition from international construction giants. The main objective of this study was to develop a conceptual model for transforming ECFs into full-fledged Project-based organisations (PBOs). The organisational design dimensions and their antecedents necessary for building the required conceptual model (CM) were identified in this study and used in the model building, as described in Chapter 7.

Based on the research findings presented in Chapter 5, the synthesis and analysis of the research results in Chapter 6, and the contribution to knowledge in Chapter 7, this chapter presents the conclusions and recommendations of the study. Section 8.2 presents the conclusions guided by the research objectives; Section 8.3 discusses the recommendations. Finally, section 8.4 covers suggestions for future studies.

8.2 Conclusions

The existing organisational design of ECFs could not respond to the uncertain, dynamic, complex, and inconsistent project environment. A Project-based Organisation (PBO) is an organisational form appropriate to such an environment. The holistic CM for transforming ECFs into full-fledged PBOs could help to create a suitable organisational environment for project-based working. The organisational design for PBOs was mainly based on contingency theory which suggests that the performance of an organisation is a result of the alignment between its external context and internal arrangements. Therefore, a range of internal and external factors influence the configuration of PBOs. This study focused on identifying the organisational design dimensions and their antecedents necessary for ECFs to transform into full-fledged PBOs. A summary of the research findings is discussed in the sections below.

8.2.1 Organisational design dimensions

The first objective of the research was to identify the core dimensions of the organisational design that are part of the fundamental requirements for local Ethiopian construction firms. This research has confirmed in Chapters 5 and 6 that strategy, process, structure, human resources, and behaviour are the core dimensions of the organisational design of ECFs.

8.2.2 Antecedents of organisational design dimensions

The second objective of this study was to study key antecedents of organisational design dimensions necessary for Ethiopian Construction firms. As a result, the study identified key antecedents of organisational design dimensions necessary for local ECFs to be transformed into full-fledged PBOs.

The six newly identified antecedents included awareness and knowledge of project management, strategic project management information systems, creating project core teams, upper management support, dynamic capability and organisational learning, and competency of project managers.

8.2.3 Development of the conceptual model (CM) for PBOs

The study's main objective was to develop a CM to transform ECFs into full-fledged PBOs. As illustrated in Figure 7.1, the CM was developed with the components and their relationships described in Chapters 5 and 6.

The research findings indicated that the organisational designs of the majority of ECFs do not exhibit the salient characteristics of a full-fledged PBO. The reason is that most firms do not sufficiently embrace key antecedents of organisational design and PBO characteristics. Hence, the CM provides a vehicle for ECFs' transforming into full-fledged PBOs. The details of the CM and how it should be applied in practice were explained in Chapter 7.

8.3 Recommendations

The recommendations listed below are based on the literature review and findings from the interviews and survey questionnaires.

8.3.1 Designing construction firms

The study provides valuable insights for CEOs and other top management members of ECFs in designing their construction firms to create a favourable environment for project work. It also provides the construction industry policymakers with a solid base for understanding the necessary components to change the face of ECFs. Furthermore, PBOs can become innovative implementers of construction projects and contribute to the development of the Ethiopian construction industry. The proposed CM comprises three organisational design phases: assessment of the internal and external environment, assessment of strategic documents, and assessment of a construction firm to exhibit PBO characteristics. The design phases call for a corresponding policy and capacity-building program within a respective firm.

8.3.2 Using Due Diligence Checklist

It is recommended that using the CM illustrated in Figure 7.1 in Chapter 7, CEOs and other top management members of ECFs develop a due diligence checklist for designing their organisations. Using the due diligence checklist based on the CM allows firms to assess their internal and external environment, strategic documents, and the assimilation of PBO characteristics.

8.3.3 Adaptability to other industries and countries

The proposed CM could be extended and adapted by other industries in Ethiopia, predominantly doing business through projects, such as marketing and consulting firms. By studying and understanding the characteristics of their respective industries, the model could be adapted to suit organisational situations. Also, the CM could be adapted and used by construction firms in other emerging economies with similar contexts.

8.4 Suggestions for Further Research

Based on the conclusions and recommendations of the study, the areas listed below could be considered for further research:

8.4.1 Revisiting existing project management training programs

A study on the quality of existing project management training programs in universities and other institutions in Ethiopia could help to understand project management better.

8.4.2 Advancement of the understanding of formal project core teams

A case study on the design and implementation of project core teams in different construction projects would be beneficial to understand the organisational design of PBOs better.

8.4.3 Extending knowledge base on PBOs beyond the construction firms

This study focused on the organisational design of ECFs working in the ECI. It could be extended to other developing countries, industries and research fields. A study to assess if PBOs in other industries exhibit similar PBO characteristics and could adapt the CM to their organisational design would help extend PBOs' knowledge base.

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APPENDICES

APPENDIX I: ETHICAL CLEARANCE

University of South Africa PO Box 392, Unisa, 0003, South Africa
Cnr Janadel and Alexandra Avenues, Midrand, 1685, Tel: +27 11 652 0000, Fax: +27 11 652 0299
E-mail: sbl@unisa.ac.za Website: www.unisa.ac.za/sbl

SCHOOL OF BUSINESS LEADERSHIP

RESEARCH ETHICS REVIEW COMMITTEE (GSBL CRERC)

16 August 2021

Ref #: 2021_SBL_DBL_022_FA
Name of applicant: Mr HA Hailu
Student #: 66575830

Dear Mr Hailu

Decision: Ethics Approval

Student: Mr HA Hailu, (66576830@mylife.unisa.ac.za , +251911179778

Supervisor: Prof PD Rwelamila, (Rwelapmd@unisa.ac.za , 011 652 0236)

Project Title: A Conceptual Model for Transforming Construction Companies into Competitive Project Based Organizations: the case of Ethiopia.

Qualification: Doctor of Business Leadership (DBL)

Expiry Date: July 2023

Thank you for applying for research ethics clearance, SBL Research Ethics Review Committee reviewed your application in compliance with the Unisa Policy on Research Ethics.

Outcome of the SBL Research Committee:
Approval is granted for the duration of the Project

The application was reviewed in compliance with the Unisa Policy on Research Ethics by the SBL Research Ethics Review Committee on the 12/08/2021.

The proposed research may now commence with the proviso that:

1) The researcher will ensure that the research project adheres to the relevant guidelines set out in the Unisa Covid-19 position statement on research ethics attached
2) The researcher/s will ensure that the research project adheres to the values and

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SBL GRADUATE SCHOOL OF BUSINESS LEADERSHIP UNISA

University of South Africa, PO Box 392, Unisa, 0003, South Africa
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principles expressed in the UNISA Policy on Research Ethics.

3) Any adverse circumstance arising in the undertaking of the research project that is relevant to the ethicality of the study, as well as changes in the methodology, should be communicated in writing to the SBL Research Ethics Review Committee.
4) An amended application could be requested if there are substantial changes from the existing proposal, especially if those changes affect any of the study-related risks for the research participants.
5) The researcher will ensure that the research project adheres to any applicable national legislation, professional codes of conduct, institutional guidelines and scientific standards relevant to the specific field of study.

Kind regards,

WBN MLiwa

Prof N Mlitwa

Chairperson: SBL Research Ethics Committee

011 - 652 0000/ wiltonb@unisa.ac.za

Prof P Msweli

Executive Dean: Graduate School of Business Leadership

011- 652 0256/mswelp@unisa.ac.za

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SBL GRADUATE SCHOOL OF BUSINESS LEADERSHIP UNISA

APPENDIX II: SUPPORT LETTER FROM MOUDC

THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA
MINISTRY OF URBAN DEVELOPMENT & CONSTRUCTION

Ref No 191
Date 08/07/2013
ADDIS ABABA - ETHIOPIA

University of South Africa
(UNISA)

Dear Sir/Madam,

It is to be recalled that your institution has requested our assistance to give support to a student named Henok Asfaw Hailu(66576830) for his Phd research entitled "A conceptual model for transforming construction companies into competitive project based organization :the case of Ethiopia"

This letter is for the confirmation of our support for this research.

Regards,

Tel 011-553-16-88 011-553-16-73 011-553-16-74 011-553-16-76
P.O.Box 24134/1000
Fax 011-554-12-67
E-mail PR.OFFICE@mudc.gov.et

APPENDIX III: INTERVIEW GUIDE

SECTION A: Opening the Interview

Welcoming note for Interviewees

Dear participants:

I would like to say welcome and express my gratefulness for your participation in this study. My name is Hailu, Henok Asfaw. This interview is part of the requirements for my PhD research under the supervision of Professor PD Rwelamila at the University of South Africa. The study intends to develop a conceptual model that could enable Ethiopian construction companies to be transformed into full-fledged Project-based organizations. The study will focus on the organizational design dimension of the companies.

The interview questions move from general to specific questions pertaining to this study. There are no wrong answers but rather different points of view in this interview. Please feel free to share your point of view. The interview will be recorded which will be later transcribed and used purely for academic research purposes. The information you provide will be kept confidential and will be used only for this research purpose. Your identity will not be revealed in any publications that proceed at the end of this study. No reference will be made in the research reports that could link you to the study.

You are invited because you are a stakeholder in the Ethiopian construction industry, so it is believed that you are familiar with the current organizational design of Ethiopian construction companies. This interview will last for approximately sixty to ninety minutes. For ethical reasons, I kindly request you to sign the informed consent form. Now, before we commence the interview if you have a question, comment or suggestion, you are most welcome.

A1: Ask the participants about their educational background and work experience in the Ethiopian construction industry

SECTION B: Interview Questions

1. How do you explain the competitiveness of local construction companies with international foreign companies working in the Ethiopian construction industry?

Probe:

- Compare your company with international construction companies working in Ethiopia

2. Does the organizational set up of your company need a redesign to be competitive with the foreign contractors? If 'no'- Why? & if 'yes', In what dimensions?

Probe:

- Discuss strategy, structure, process, behavior and human resource dimensions
- Forward any other dimension that should be considered

3. Do you think projects have been given due attention by the upper managers of the organization? Explain in detail

4. Is there any formal strategic document used by the company with clear connection between projects and the organization strategy? If so explain in detail and if not, why?

5. Are project goals clearly linked to organization's strategic goals?

Probe:

- If yes, in what aspects? If not what do you think is the reason?

6. Do the current organizational structure of your company support project works?

Probe:

- In what aspects?

7. Have your organization defined project management processes?

8. Is there a project management office that bridges your organization with its projects?

9. Do you think that your organization is adapting to changes readily?

10. Can you explain in details how a typical project is organised from planning to implementation?

Probe:

- If some works are subcontracted what approaches are used, and how is the subcontracted work procured, managed, monitored, and controlled?
- What are the processes of hiring project managers and other project employees?

11. Do upper managers of the organization and project core team members work together for all project set-ups?

12. What challenges do you think affect the strategy of your organization to be transformed into competitive Project-based organization?

13. What factors should be considered in re-designing your current organization structure in order to fulfill the requirements of transforming your organization into a competitive Project-based organization?

14. What drivers need to be addressed regarding the processes within your organization (parent organization and project level) so as to transform into a competitive Project-based organization?

15. What could improve the human resource management of your organization to be able to contribute towards making your organization a competitive Project-based organization?

16. What antecedents do you think affect the behavior/culture/ of your organization towards becoming a competitive Project-based organization?

17. Besides the above-mentioned organizational dimensions, what another dimension/s do you have in your mind?

---------- THANK YOU VERY MUCH FOR YOUR TIME ----------

APPENDIX IV: QUESTIONNAIRE

A Conceptual Model for Transforming Construction Companies into Full-fledged Project-based Organizations – the Case of Ethiopia

Dear Participant:

I would like to thank you for your willingness to participate in this study. My name is Henok Asfaw Hailu. The survey is part of the requirements for a PhD research under the supervision of Professor PD Rwelamila at the University of South Africa. The study intends to develop a conceptual model that could help Ethiopian construction companies to be transformed into full-fledged Project-based organizations (PBOs).PBOs, including construction companies, are organizations where their business activities are implemented and managed through projects. The study focuses on the organizational design dimensions of **Grade I contractors**: their strategy, structure, process, human resource (HR) and behavior.

- You have been invited to participate in this study in consideration of your knowledge and experience in the Ethiopian construction industry.
- All information provided will be treated anonymously.
- The researcher assures you that all information will be kept confidential.
- When responding to the questions, please refer to Grade I construction companies you have worked in or aware of.
- The research has been granted an ethical clearance from University of South Africa (UNISA)
- A report showing research main results can be provided to companies asking for it.
- If you are responding on the soft copy: Please **click once** on your choices, save it and send back to the address you received the questionnaire from.
- You are making a decision whether or not to participate by continuing to the next page. You are free to withdraw from the study at any time.

Section A: Background of the Respondent

1. The type of organization the respondent working

Building contractor ☐General Contractor ☐Road Contractor ☐ Specialized Contractor ☐
Project owner☐ Consultant ☐ Regulatory Body ☐ any other (please specify) _____

2. Position in the company _____

3. Please select your highest qualification

Diploma ☐ Bachelors ☐ Masters ☐ PhD ☐
any other (please specify) _____

4. Have you received any Project Management related training?

Yes ☐ No ☐

If yes, what was the highest level of training you received?
Masters ☐ Bachelors ☐ Certificate ☐ Short-term training ☐
as a course in a related program of study ☐ , any other _____

5. Years of experience of the respondent in the Ethiopian construction industry
Less than 5 years ☐ From 6 to 10 years ☐

From 11 to 15 years ☐ Over 15 years ☐

6. Years of experience of the respondent's organization in the Ethiopian construction Industry

Less than 5 years ☐ From 6 to 10 years ☐

From 11 to 15 years ☐ Over 15 years ☐

Section B: Salient characteristics of full-fledged Project-based Organizations (PBOs)

	1 SD	**2** D	**3** N	**4** A	**5** SA
1.The organization delivers projects for its business purposes	☐	☐	☐	☐	☐
2. Upper managers give value to the role of a proper project management to manage projects	☐	☐	☐	☐	☐
3.The processes required to execute project tasks are well designed	☐	☐	☐	☐	☐
4. The organization has a unit for managing projects, programs and portfolios	☐	☐	☐	☐	☐
5. There is a clear designed system for sharing of information throughout the organization	☐	☐	☐	☐	☐
6.The organization adapts readily to changes encountered at project execution	☐	☐	☐	☐	☐
7. Upper managers are authentic and act with integrity	☐	☐	☐	☐	☐
8. Upper managers continuously support projects	☐	☐	☐	☐	☐
9. People in the organization embrace cross functional team work	☐	☐	☐	☐	☐
10. Everyone at the organization acts together for the success of projects	☐	☐	☐	☐	☐
11.Clear performance indicators are in place for monitoring the performance of project managers	☐	☐	☐	☐	☐

Section C: Design Dimensions of Competitive Project-based Organizations(PBOs)

I. Strategy					
1. Projects are the primary business mechanisms for coordinating and integrating all the main business functions of the organization	☐	☐	☐	☐	☐
2. The organization's knowledge, capabilities and resources are built up through the execution of projects	☐	☐	☐	☐	☐
3. Project managers within the organization hold a top management role to have direct control on business functions and resources of their projects	☐	☐	☐	☐	☐
4. Goals and objectives of the organization support the improvement of performance of projects	☐	☐	☐	☐	☐
5. There is a trend in strategy preparation of the organization to integrate projects with the organization	☐	☐	☐	☐	☐
6. Project management offices functions are aligned with the strategic priorities of the organization	☐	☐	☐	☐	☐
7. There is alignment between project management office functions and project priorities	☐	☐	☐	☐	☐

1 Strongly Disagree; 5 Strongly Agree

	1 SD	**2** D	**3** N	**4** A	**5** SA
II. Processes					
1. Upper managers in the organization are aware of the methods used for managing projects	☐	☐	☐	☐	☐
2.The organization has a standard project management processes in place	☐	☐	☐	☐	☐
3. Upper managers of the organization have been trained in project management	☐	☐	☐	☐	☐
4.A system is best positioned in the organization to acquire knowledge about new construction technologies to be used at projects	☐	☐	☐	☐	☐
5. There is a mechanism for testing new ideas in the organization	☐	☐	☐	☐	☐
6. Projects at the organization have a situational problem-solving capability	☐	☐	☐	☐	☐
7. Project management processes are well documented and controlled in the organization	☐	☐	☐	☐	☐
8. A strategic decision is made by the organization to use a project management information system	☐	☐	☐	☐	☐
9. There is a designed process for project audits and reviews to help present and future project managers learn from past experiences	☐	☐	☐	☐	☐
III. Structure					
1.The organizational structure has created a fit between the processes adopted and the decision to be project oriented	☐	☐	☐	☐	☐
2.There is a structure that made an alignment between processes in the organization and projects	☐	☐	☐	☐	☐
3.The organizational structure has created an alignment between processes within the different functions of the organization	☐	☐	☐	☐	☐
4. The organizational structure has created an alignment between processes in the different project level functions	☐	☐	☐	☐	☐
5. There is a dedicated project management office at the organization that link the organization with projects	☐	☐	☐	☐	☐
IV. Human Resource					
1.The human resource management of the organization is supportive of projects	☐	☐	☐	☐	☐
2.There are selected human resources management practices that are specifically adopted for projects	☐	☐	☐	☐	☐
3.The human resource configuration of the organization could be easily reconfigured when a new project is commenced	☐	☐	☐	☐	☐

1 Strongly Disagree; 5 Strongly Agree

	1 SD	**2** D	**3** N	**4** A	**5** SA
4.There is a flexible carrier development program for project employees with consideration of the dynamic nature of projects	☐	☐	☐	☐	☐
5. There is a motivational scheme conditioned by the complexity and intensity of projects	☐	☐	☐	☐	☐
6.The organization provides incentives for individual innovations at projects	☐	☐	☐	☐	☐
7.The organization has a specific process for recruiting and developing project managers	☐	☐	☐	☐	☐
8.Project managers are also involved in the human resource management of projects	☐	☐	☐	☐	☐
9.The project manager's competence is considered as a success factor for projects performance	☐	☐	☐	☐	☐
10. Project management training is provided for project team members	☐	☐	☐	☐	☐
11. The well-being of project members is given due attention by the organization	☐	☐	☐	☐	☐
12.The organization has a specific process of developing a project manager that includes training, mentoring, and coaching	☐	☐	☐	☐	☐
V. Behaviour					
1.Projects are managing the communications right: the right information reaching the right team member	☐	☐	☐	☐	☐
2.There is a defined formal communication framework that involve all external and internal stakeholders of the project	☐	☐	☐	☐	☐
3.There is an understanding on the expectations of important stakeholders of the project	☐	☐	☐	☐	☐
4.The organization is flexible to of adapt its processes and Structures to the evolving context	☐	☐	☐	☐	☐
5.Cross-functional teams are prevalent at projects	☐	☐	☐	☐	☐
6.The organization is working to adopt a project-oriented culture	☐	☐	☐	☐	☐

Section D: Antecedents of organizational design dimensions of full-fledged PBOs

1 Strongly Disagree; 5 Strongly Agree

	1 SD	**2** D	**3** N	**4** A	**5** SA
I. Project orientation					
1. Strategic documents are prepared with consideration of projects	☐	☐	☐	☐	☐
2.The organization recognize the significance of projects	☐	☐	☐	☐	☐
3.The strategic value of a proper project management is understood by the organization	☐	☐	☐	☐	☐
II. Project working					
1.Project work processes are well designed by the upper management	☐	☐	☐	☐	☐
2.Organization and project work procedures are aligned	☐	☐	☐	☐	☐
3.Standard project management processes are sufficiently incorporated to execute project works	☐	☐	☐	☐	☐
III. Fit					
1.The well-defined processes at the organization are conducive to bring behavioural improvements at projects	☐	☐	☐	☐	☐
2.The actual work processes match the designed organizational structure of the organization	☐	☐	☐	☐	☐
3.The existing organizational structure align with strategy of the organization	☐	☐	☐	☐	☐
IV. Project culture					
1.The mind set of project members is ready to take in new better systems to their projects	☐	☐	☐	☐	☐
2.The organization easily adapt to changes when commencing new projects	☐	☐	☐	☐	☐
3.There is a culture of planning than rushing to project works	☐	☐	☐	☐	☐
4.There is no difficulty for the organization to develop an identity due to high turnover	☐	☐	☐	☐	☐
V. Churn (the continuous repositioning of employees from projects)					
1.Most project works are currently subcontracted	☐	☐	☐	☐	☐
2.Motivational schemes are in place for project staffs being transferred to other projects	☐	☐	☐	☐	☐
3.Project members are satisfied by the existing project work procedures	☐	☐	☐	☐	☐
VI. History and context of organization, leadership					
1. Autonomy is given to upper level managers by the shareholders	☐	☐	☐	☐	☐
2.The shareholders of the organization have a long term vision	☐	☐	☐	☐	☐

1 Strongly Disagree; 5 Strongly Agree

	1 SD	**2** D	**3** N	**4** A	**5**SA
3.The organization has a proper strategic document	☐	☐	☐	☐	☐
4.There are sufficient ethical professionals available in the market	☐	☐	☐	☐	☐
5. There is fair competitive bidding trend in the construction industry to acquire projects	☐	☐	☐	☐	☐
VII. Size					
1.Project execution plans in the organization depend on the size of the projects	☐	☐	☐	☐	☐
2.The organization is competitive in bigger sized projects	☐	☐	☐	☐	☐
3.The organizational structure of projects consider the size of the projects	☐	☐	☐	☐	☐
VIII. A shareholder versus stakeholder orientation(Governance)					
1.The continuous improvement of project members performance is monitored by the shareholders	☐	☐	☐	☐	☐
2.There is a corporate level thinking by the shareholders	☐	☐	☐	☐	☐
3. Shareholders are the dominate ones than stakeholders in managing projects	☐	☐	☐	☐	☐
IX. Control by behaviours or results					
1.The organization is not focused with its current problems just to complete their projects	☐	☐	☐	☐	☐
2.The organization has a strong structure that could enable to follow up projects	☐	☐	☐	☐	☐
3.The organization continuously evaluate its project works	☐	☐	☐	☐	☐
X. Uncertainty, dynamism, and complexity					
1. Project owners interests are changing frequently	☐	☐	☐	☐	☐
2.The organization is not busy to acquire projects with different approaches	☐	☐	☐	☐	☐
3.The current macroeconomic environment of the country is encouraging to plan for long term	☐	☐	☐	☐	☐
XI. Awareness and knowledge of project management					
1.There is sufficient project management knowledge at project levels	☐	☐	☐	☐	☐
2.There is sufficient project management knowledge by upper managers	☐	☐	☐	☐	☐
3. Project members understand the nature of projects	☐	☐	☐	☐	☐
XII. Creating project core teams					
1.Formal teams from different departments are created for execution of project works	☐	☐	☐	☐	☐
2.The current project set ups are conducive to execute tasks	☐	☐	☐	☐	☐

1 Strongly Disagree; 5 Strongly Agree

	1 SD	**2** D	**3** N	**4** A	**5** SA
3. Upper managers understand the value of a core team approach	☐	☐	☐	☐	☐
XIII. Strategic project management Information system					
1. Value is given by upper managers for organizational wide information system	☐	☐	☐	☐	☐
2.There is an information system for communications between project members	☐	☐	☐	☐	☐
3. Project stakeholders information is properly shared on projects	☐	☐	☐	☐	☐
4. The prevalent system at projects supports organizational learning	☐	☐	☐	☐	☐
5. There is a digitalized documentation system at projects	☐	☐	☐	☐	☐
XIV. Dynamic capability and organizational learning					
1. New work methods are appreciated to execute project tasks	☐	☐	☐	☐	☐
2.There is a tendency towards managing projects in new innovative approaches	☐	☐	☐	☐	☐
3.The organization is determined to properly establish project management processes at projects	☐	☐	☐	☐	☐
4. There is no resistance to a system change on managing projects due to fear of failure	☐	☐	☐	☐	☐
XV. Upper management support					
1. There is a continuous support to projects at implementation phase by the upper management	☐	☐	☐	☐	☐
2. Upper managers give feedbacks to project reports	☐	☐	☐	☐	☐
3. Upper managers positively influence the behaviour of projects members	☐	☐	☐	☐	☐
4. There is a continuous communication between the upper management and projects	☐	☐	☐	☐	☐
XVI. Competency of project managers					
1.The processes necessary to select and develop project managers are in place	☐	☐	☐	☐	☐
2. Project managers are autonomous in their works	☐	☐	☐	☐	☐
3. Project manager's work with sufficient project management knowledge	☐	☐	☐	☐	☐
4. The project managers in the organization has a leadership capability	☐	☐	☐	☐	☐
5.Changes are properly handled by project managers	☐	☐	☐	☐	☐

---------- THANK YOU VERY MUCH FOR YOUR TIME----------

APPENDIX V: INTERVIEW TRANSCRIPTS

Interviewee **1**

Organization **Consultancy Firm**

Respondent Occupation **General Manager**

Interviewer: Good afternoon. Thank you for your willingness to participate in this interview. Before going to the discussion, Could you please give me a brief overview of your academic background and experience in the Ethiopian construction Industry?

Respondent: Thank you. I have acquired MSc in civil engineering. I have been working at different construction companies and consultants for the last 22 years, mostly at top management levels. Currently I am a General Manager of a Grade I consultancy firm which is founded by myself.

Interviewer: How do you explain the competitiveness of local construction companies with international foreign companies working in the Ethiopian construction industry?

Respondent: Currently the local contractors are not competitive.

Interviewer: What do you think is the reason?

Respondent: There is a lack of knowledge on how to manage construction projects by the top management. Sometimes company owners try to hire professionals to manage their company, but still do not give full autonomy to these hired professional managers. The other thing is the assigned managers do not have sufficient knowledge of project management. This has made the growth trend of local construction companies to go upward on the first years, then reach at their peak at some point and finally they start to go down. In my opinion it is their set up that has caused such trend.

Interviewer: Is there any formal strategic document prepared by the companies?

Respondent: They have a strategic plan prepared for the sake of just having it, prepared by external consultants with minimum involvement of the organizations. It is not prepared following the scientific approaches required for a strategic plan preparation. It is not much different from those strategic plans prepared for manufacturing and service industries. It doesn't seriously consider project works.

Interviewer: What type of organizational structure is being used by construction companies? Do you think the current organizational structure of the construction companies support project works?

Respondent: Smaller construction companies use functional structure. But Grade I contractors, which are bigger in size use a weak matrix structure. They usually have a project coordinator position at organization level to link projects with the organization.

Interviewer: How about a separate project management office that bridges your organization with its projects?

Respondent: No, it is at an individual level as I mentioned earlier.

Interviewer: Do you notice construction companies define project management processes?

Respondent: The common thinking is that the head office should just provide resources and the duty of a project is to make use of these resources to perform tasks. The standard project management processes that link organizations with their projects and within projects are not known. Organizations only give due attention to procurement, logistics, and finance-related processes. Project management knowledge is considered an extra thing. Everyone is much concerned about technical knowledge. I think the reason why project management is not valued much is due to lack of awareness and knowledge of project management at the different levels including the upper management, project managers, and project members.

Interviewer: How are tasks performed at project levels? Are there formal project teams at projects designed by upper managers to execute project tasks?

Respondent: The project manager will be managing project works with representatives of each head office departments. As a matrix structure the representatives are working both with the head office and the project manager. Horizontally, there is an informal team created to perform specific project tasks. Otherwise there is no formal project team which continuously work.

Interviewer: How are the upper mangers of construction companies communicating with their project core team?

Respondent: The upper management and projects mostly communicate just through progress reports directly with the project manager as there is no formal project core team. But the true reason for the report preparation is an obligation by external parties including project owners and consultants. This can be noticed as there is no trend of giving feedbacks for the reports by upper managers. An informal communication is common in most organizations. But this informal communication especially with company owners is creating chaos at construction firms and does not much help the projects.

Interviewer: Is there any ICT platform designed at organizations to facilitate the project management process?

Respondent: Currently Social media platforms like whatsApp and telegram are being used. But there is no well-designed technology or software implemented for this purpose.

Interviewer: Do you think that the construction companies are adapting to changes easily?

Respondent: Yes, but only on some areas. Major changes usually happen when new projects commence. The organizations usually prepare a mobilization action plan and then start staffing. The big shake happens when they receive an advance payment. This cash flow is commonly followed by entrenchment by the contractors which would in turn cause cash shortage on the project. At this time a clash would be initiated between the client and the contractor, the client asking “Where is my money?” in which the organization staffs find it difficult to handle.

Interviewer: How is the human resource element of the construction companies being handled?

Respondent: Most of the project works are subcontracted. The human resource management for the company staff is not taken seriously. Skilled and unskilled employees continuously come and leave the organizations and their projects. In my opinion, the organizations should think out of the box and design a motivational scheme and incentives for all their staff according to their performance. Also, staffs leaving their stable houses for project works need to be compensated.

Interviewer: Do upper managers of the organizations give due attention to the projects?

Respondent: Yes, but only at the start of the projects and when a serious problem is encountered on the projects. But this relationship is not continuous and well systematized.

Interviewer: Can you explain in detail how a typical project is organised from planning to implementation?

Respondent: When projects are acquired, assignment of key personnel is the initial thing commonly done. Sometimes well performing staffs from other projects will be picked for the new project. This had a negative impact on the previous projects performance due to losing their staffs. Regarding the project activities, they are mostly

done by subcontractors. The organizations usually have their own subcontractors as partners.

Interviewer: In your opinion what measures should be taken to redesign the construction companies and make them competitive?

Respondent: This needs knowledge and awareness of the company owners. They need to know the true value of the required organizational redesign. They want to know what they would get out of it as a business people. But if one or two organizations take the lead prove it right, many would follow. The previous practice of the different management systems like BPR and BSC had created a negative perception not to accept new knowledge at first hand.

Interviewee **2**

Organization **Consultancy Firm**

Respondent Occupation **General Manager**

Interviewer: Good Morning. Thank you for dedicating your precious time to participate in this interview. Before going to the discussion, Could you please give me a brief overview of your academic background and experience in the Ethiopian construction Industry?

Respondent: By profession I am a civil engineer and reached to a 3rd degree (PhD) in construction management. I have been working at different construction companies and consultants for the last 20 years. Currently I am a General Manager of a consultancy firm.

Interviewer: I think you are also a lecturer at universities?

Respondent: Yes, I give lecturers at different universities on construction management areas.

Interviewer: How do you see the competitiveness of local construction companies with international foreign companies working in the Ethiopian construction industry?

Respondent: When you say competitiveness, in what area? Is it in organizational set up, finance, knowledge or what?

Interviewer: Sorry sir for not specifying it clearly. I was referring to the competitiveness in their organizational design.

Respondent: In that case I couldn't say they are competitive enough. Fortunately I am currently involved in a research on competitiveness of local contractors in International Competitive Bids (ICB) to be completed in three or four months. It is being done at national level.

Interviewer: Why do think is the reason for their non-competitiveness?

Respondent: Well. In my opinion, I don't think a shortage of resources including finance, is not the reason. Even if there is such a problem it could be solved. The major problem is the absence of clear processes to execute works as an institution both at the parent organization and project levels. This is happening even in the presence of a proper organizational structure. Even the top managers do not have proper knowledge of project management processes. This problem is not limited to the construction industry but also existent in other industries working with projects. The other issue is the poor productivity noticed on the industry which is also a problem for the international companies. The international companies coming to the Ethiopian construction industry give inductions and trainings for their employees on project management and other areas to tackle this.

Interviewer: Does this mean that the local construction companies need to redesign themselves?

Respondent: Yes. But the redesign work should not be limited to changing their organizational structure. It should include changing the mind set up of the employees from top to down.

Interviewer: How about strategy?

Respondent: Yes, strategy is a very critical thing to be considered. Not a few local companies have a strategic plan. I doubt that the shareholders and top level managers of the construction companies well understood the true value of a strategic document. Also I had an opportunity to overview the strategic plans of some construction companies. They were incomplete and not well prepared.

Interviewer: Is there strategic document showing the link between projects and the organization?

Respondent: As I mentioned it earlier I had an opportunity to overview the strategic plans of few Grade I construction companies. I appreciate their initiative taken for the preparation of the document. The goals and objectives on the strategic documents are not feasible and far from the reality. They need to be realistic and refined. Regarding the

link between projects and the organization, there are some statements placed to show the value of the linkage between the head office and projects. But I have not seen the "how to link" strategy in their strategic plans.

Interviewer: Do you think projects have been given due attention by the upper managers of the organization?

Respondent: I don't think so. I had worked on project levels and we used to say "The Head office is not giving us any attention". We said this due to the delay of responses to our resource requests.

Interviewer: Do the organizational structure of the construction companies support project works?

Respondent: Yes but it usually remains at paper work level. The companies knew that they would not exist without the projects. The problem is the implementation phase. They don't stick to the designed structure.

Interviewer: Do you notice construction companies consider project management processes defined by PMI?

Respondent: I don't think so. Most of them are not even aware of PMI and body of knowledge including the company managers.

Interviewer: What type of organizational structure do they have? Do they have a separate project management office that bridges the organization with its projects?

Respondent: They use a matrix structure. The head office department managers communicate with the project members bypassing project managers. This usually creates dispute between the project managers and department heads. This makes the project powerless and discouraged. Also there are individuals assigned to support projects but not at office level. But I don't think they are working to the expected level.

Interviewer: Different projects come from different clients. They are also located at different locations and environment. Do you think that the construction companies are adapting to changes created by this?

Respondent: No, since the contractors immediately get submerged with the new project tasks. They don't seriously sit, think and make themselves ready for the new projects. They don't plan on how to respond to the new change.

Interviewer: Can you explain in detail how a typical project is organised from planning to implementation?

Respondent: It depends on the different maturity of the organizations. Some construction companies will exhaustively think and aggressively act to get new projects as they are on the verge of completing an existing project. This will help them to use the idle resources for the new one. Such companies who have the culture of planning are the bigger ones. In my opinion there are three types of Grade I contractors. The first ones are those who have sufficient experience, capacity and human resources. The other types are contractors who are noticed just on some project, with no proper working head office. The third ones are in between. The first ones would not face much problem to get the resources and smoothly get into the job. Such companies usually have long term partnership with selected subcontractors.

Interviewer: How are projects executed and is there any formal team set to perform project works?

Respondent: Not at all. There is no formal horizontal team linkage at projects. The project manager himself tries to form a committee for his project. But this committee/group is not formal and not recognized by the upper management. The group doesn't work regularly and conducts continuous meetings. There is no trend to establish a formal project team by the upper management at the start of projects. Everyone is running to meet his target at any cost. That's why everyone is blaming each other at progress meetings. Resolving such fights is a usual task of project managers. Every project member communicates with the corresponding functional superiors at the

head office. There is no formal core team at projects that could decide on project issues.

Interviewer: Do the upper managers of construction companies communicate with their project core team?

Respondent: This is a good question. In my experience, the top managers communicate with selected individuals informally. The communication is not properly channeled with formal reports. The upper managers mostly communicate with the construction engineer directly and don't give much attention to the office engineers and other project members.

Interviewer: How is the human resource element of the construction companies being handled?

Respondent: This is an interesting and contemporary issue. Recently construction companies are starting to understand the invaluable contribution of the human resource element for the success of a company. Knowing the dynamic nature of projects, they are currently trying to retain employees by different approaches. One approach I noticed at some companies is making their employees multi tasked. This is very helpful since projects have different phases. Such good practices are being noticed at construction companies.

Interviewer: What antecedents do you think affect the behaviour of construction companies towards becoming a competitive Project-based organization?

Respondent: To take about organizational behaviour of a company first the current high turnover should be minimized. This is because behaviour develops through time. Few construction companies with high retention have an identity. For example some are known for quality works and others for their timely delivery.

Interviewer: In your opinion what measures should be taken to redesign the local construction companies and make them competitive project-based organizations?

Respondent: It should start from the mind-set of the company owners and top-level managers. They should first know the true value of having a strategic plan and the other dimensions you mentioned. If they have a long-term vision and mission, strategy and the others could be prepared subsequently. A company that wants to stay long in the construction industry could not neglect projects as they are the ones bringing the cash inflow. The strategies should be prepared including project team members. The organizational structure could then be prepared and aligned with the strategy. Regarding the processes, they should be included in the preparation of the strategic plan. Process mapping needs to be done while preparing any strategic document and when it comes to construction companies, project-based companies need to include the PMI processes and knowledge areas. All these steps should be aligned but missed in our construction industry.

Interviewee **3**

Organization **Construction company**

Respondent Occupation **Engineering Director**

Interviewer: Good afternoon. Thank you for willingness to participate in this interview. Before going to the discussion, Could you please give me a brief overview of your academic background and experience in the Ethiopian construction Industry?

Respondent: Thank you. I have BSc in civil engineering and got my MBA recently. I have been working at different Grade I construction companies locally and internationally for the last Eighteen years. Among those years, I have worked for five years in the Middle East at a construction company. Currently I am the Engineering director of a Grade I Construction firm in Ethiopia.

Interviewer: How do you see the competitiveness of local construction companies with international foreign companies working in the Ethiopian construction industry?

Respondent: I don't think they are competitive in different dimensions. For instance let us see their timely delivery and quality of works. The current major international construction companies flooding the Ethiopian construction industry are mostly Chinese and Turkish companies. Mostly these companies are delivering their projects in time and with better quality than the local ones. They have introduced a culture of working for extra hours, a culture of working in shifts. The growth history of most local construction companies is not healthy. They acquired projects with a least bidder procurement approach which led them to compromise quality and not hire proficient professionals. That has made them develop an inherent poor culture of quality. They would then continue even when they acquire a project with very good contract amount. Regarding delay of projects, the main drawback is poor planning. They don't prepare a proper workable project schedules. I had once faced a related case. The company I used to work and other international company were awarded two similar projects with similar project amounts. The international company did not start immediately, they were planning to details. We started immediately without the necessary planning and

preparation. We failed. The international company delivered in time and with better quality. That is why I said the local construction companies are not competitive. The international companies seriously train and develop their manpower to ensure quality and also plan properly.

Interviewer: Does this mean that the local construction companies need to redesign themselves?
Respondent: Yes. They need a fundamental change in many aspects.

Interviewer: Let us start from strategy. Do you think they have a strategic document showing the link between projects and the organization?

Respondent: Yes some are noticed trying to prepare it, but it is not well prepared. It needs improvement. Also the companies do not implement it. In my opinion this happened because the company shareholders do not internalize the true benefit of the strategic plan from the beginning. This is clearly noticed on their reservation to approve payments for the implementation of the strategy. The other problem is the absence of communicating the document to all levels. The other issue that sometimes made strategic plans untrustworthy is the very unpredictable nature of the Ethiopian political and economic condition which could in turn create a discrepancy between the strategic plan assumptions and the reality on the ground.

Interviewer: Have the strategic plans tried to link the projects and the organization?

Respondent: Theoretically yes. The main problem is the implementation phase. At the implementation phase, the strategic document will be tabled only at the head office.

Interviewer: Are project goals clearly linked to organization's strategic goals?
Respondent: To my understanding, on the bigger governmental projects they align on project targets since the project objectives do not much change drastically. The difficulty to link the strategic goals and project goals is mostly seen when working with private

project clients. Most private-owned and other projects in Ethiopia are usually faced with a continuous change of interest by the client making it difficult to implement the construction company's strategic goals. This would force the contractor to be too focused on results, neglecting the required improvement of behaviour of project members.

Interviewer: Do you think projects have been given due attention by the upper managers of the organization?

Respondent: In my experience, the construction firms usually give support to projects at the beginning of a project and when the client calls for a meeting. Usually, after 2 or 3 months from the commencement date, the project manager would start to lose support. Then the project manager and the other project team members would then start to beg for support.

Interviewer: Do the organizational structure of the construction companies support project works?

Respondent: Yes the operation division/department structure at the head office is meant for this purpose. But as I have mentioned earlier, the problem is the continuity issue. They don't stick to the end.

Interviewer: Do you notice construction companies consider project management processes defined by PMI?

Respondent: This is what critically differentiates the local construction companies from the international ones. As I told you at the beginning, I have worked with an international company abroad. The international construction companies consider standard project management processes in every project activity from the project commencement to completion. The local construction companies in Ethiopia consider a few of those processes at the beginning of their projects. But in time the verbal communication will take over neglecting everything, especially in privately owned projects.

Interviewer: Do they have a separate project management office that bridges the organization with its projects?

Respondent: There are individuals or operation department assigned to support projects but not at office level. But usually are not autonomous and bypassed by different parties. They are not considering the PMI knowledge areas in their processes.

Interviewer: Different projects types come from different clients. They are also located at different locations and environment. Do you think that the construction companies are adapting to changes created by this?

Respondent: Some are trying to adapt but painfully. Let me tell you my experience in the previous company I worked. The company was specialized in building construction projects when received an opportunity to work on a stadium project. We were not experienced on such projects become confused. Painfully we hired those experienced in such projects and gradually adapt to the construction of stadiums in time. But to speak frankly, the change had shaken the whole company for quite some time.

Interviewer: Can you explain in detail how a typical project is organised from planning to implementation?

Respondent: The first thing usually done is staffing of key personnel to be followed by scheduling. The schedule is usually done with the involvement of the new key personnel. Material resourcing and equipment deployment then follows

Interviewer: Do the upper mangers of construction companies communicate with their project core team?

Respondent: Yes as I have mentioned earlier they communicate properly and follow up the project seriously only at the beginning. But we don't have the culture to abide to rules and regulations for long time.

Interviewer: In your opinion what measures should be taken to redesign the local construction companies and make them competitive project-based organizations?

Respondent: Primarily, the company owners and upper managers need to understand that the projects should be self-directed. They should be given authority but with responsibility. Projects need to have a say on financial and budget allocations. The head office should not interfere on the project routines but rather support the project team.

Interviewer: What factors should be considered in re-designing the current organization structure in order to fulfil the requirements of transforming your organization into a competitive Project-based organization?

Respondent: The organizational structure should be more focused the operations and financial activities.

Interviewer: How about the processes?

Respondent: As a project-based organization, the projects should know and exercise their activities in consideration of PMI defined processes. This can be realized by preparing work procedures and formats for activities that could address PMI body of knowledge areas. These days it is the head office which is very busy on procurement and other contractual issues.

Interviewer: What could improve the human resource management of your organization to be able to contribute towards making your organization a competitive Project-based organization?

Respondent: The construction companies usually do not train and develop their manpower. They try to go to the market and bid for qualified personnel. People coming with such approach might not hesitate to leave the company. The companies should think on how to retain them. This could be done by preparing motivational schemes. The provision of well-planned trainings usually interest employees to stay in companies. The salary scales should also be revised as per the market and the company capacity. The culture of paying on time at projects could enable to retain employees, especially in project-based organizations.

Interviewer: What antecedents do you think affect the behaviour of construction companies towards becoming a competitive Project-based organization?

Respondent: The construction company should work on common frameworks like company rules and regulations; discipline, time concept, quality awareness and other issues at an organization level. But projects should be given the room to adapt to new project environments including new client culture, change in location and other factors. But the new exposures should not be allowed to damage the core values of the company. This can be done by having common trends /frameworks/ that could work for all projects.

Interviewee **4**

Organization **Construction company**

Respondent Occupation **Managing director**

Interviewer: Good Morning. Thank you for willingness to participate in this interview. Before going to the discussion, Could you please give me a brief overview of your academic background and experience in the Ethiopian construction Industry?

Respondent: Thank you and sorry for postponing our last meeting. I am a civil engineer by profession. I have been working at different Grade I construction companies for the last twenty six years. I have established my own company twelve years ago. Currently I am the Managing director of this Grade I Construction Company.

Interviewer: How do you see the competitiveness of local construction companies with international foreign companies working in the Ethiopian construction industry?

Respondent: In my opinion very few are competitive but most are not. This is shown in their poor performance at different construction projects. They don't have the organizational setup and culture to accomplish projects in time and with quality. For your surprise some of the Grade I contractors even don't have proper offices. The other problem is the poor procurement system which made the contractors to acquire projects with a least price which in turn incapacitated their performance.

Interviewer: But some argue that they would not perform if they get a project with very high price?

Respondent: There are very few matured local construction companies who can perform well and be competitive in the smaller building projects if given the opportunity. But in mega building and road projects, we cannot compete with the international companies in our current setup. But we need to work on our management skills and new technologies for bigger projects. Even our top managers are not familiar with

project management. They are only good on the technical aspects like designs, construction methodology and the like.

Interviewer: Let us start from strategy. Do you think they have a strategic document showing the link between projects and the organization?

Respondent: To be frank, we don't have a working strategic document. The one we have in our table is not a realistic document. We just have a common practice of posting some visions and missions on our office walls.

Interviewer: What do you think is reason for this?

Respondent: Most of us are busy with our day-to-day problems like financial problems and shortage of materials on the market. We are engulfed with these problems not to think about the future. Due to this, we don't do much work on long-term issues. We expect our project managers to do anything to complete projects. The other serious problem is the negative perception on us by stakeholders specially the government. Our relationship with clients is also like a "Mouth and Rat" relationship. We are considered as corrupted people but not as valuable institutions. That does not energize us to plan long term and create a proper institution. The other serious problem is our culture. We don't have a tendency to plan for long. These might be changed by awareness creation programmes and trainings. We should try to change the culture by contributing our part. For example we have culture to make sure changing rooms, toilets and canteens are available before starting our project. If our Project manager left our company and join another company he would surly work on these facilities. Then it would become a culture in the industry. In my opinion there should be also a pioneer on these strategic planning. If a company implement these things and become successful, then many would follow it.

Interviewer: How about organizational structure? Are you implementing functional, matrix or what?

Respondent: We are using a functional structure. The actual practice on this aspect is also very poor. If we are not available at our office things get stagnant. You will lose your company if you delegate it to somebody for long time. Few friends of mine have tried to properly structure their company but have failed. This is because we don't find qualified and trustworthy people to delegate. There is also a clear leadership gap in our technical managers. Also there is a common culture in Ethiopia that doesn't encourage delegation. There is an Ethiopian saying interpreted as "The wood will not burn without its owner". Sorry to say the culture has negatively affected me on this issue. Personally I have not invested my time in system development seeing the failure of my friends. I have lost my trust on the value of system development. I have a short span company structure.

Interviewer: Do you notice construction companies consider project management processes defined by PMI? How about project works, is there are any formal team to perform tasks?

Respondent: Not fully but partially. The few processes are incorporated under the operation and contract department. Project members meet informally while doing project works. But it is not officially recognized and not continuous.

Interviewer: Are project goals clearly linked to organization's strategic goals?

Respondent: If the Project manager or member is already in the company for quite some time, there is no problem to link with the Head office. The problem is when a new Project manager or member comes. We usually feel the pain of the absence of a proper organizational structure in such times. There is team that could continue the works. To minimize such pains, we try to mix a new staff with an existing staff.

Interviewer: How about information system at projects?

Respondent: Currently, we use email and social media groups like Telegram. But we do not have a website or a digital platform to communicate with our project members and the other project stakeholders. Due to this, we are facing big problems in preparing time and cost claims. We have lost a lot due to missed letters and inspection

certificates. We have failed to properly document our correspondences, inspection certificates, and other useful documents. I think this should be seriously considered by the top management in the future.

Interviewer: Do you have a separate project management office that bridges the organization with its projects?

Respondent: There is no separate office for this purpose. There different departments are sharing different responsibilities. For instance the operation department makes sure that resources are availed for the projects.

Interviewer: Do you redesigning the local construction companies could make them competitive project-based organizations?

Respondent: NO, Personally I don't believe on the redesign issue.

Interviewer: What is your reason for this?

Respondent: The growth trend of most Ethiopian construction companies is growing steadily at the first years, stay at the peak for some time and then going down steadily. Their life time is usually about ten years. I am just following the footsteps of three companies which passed the ten year syndrome. These companies are family companies working only limited projects which could be managed by the owners themselves.

Interviewer: What do you think is the reason for the failure of those companies you raised?

Respondent: Their divestment is the main reason followed by corruption. The other thing is the absence of project mentality by their company members. Let me tell you some funny example. There was one project I knew with 10 months duration outside of Addis. Surprisingly the Project manager assigned their immediately got registered started to study his MBA. There is no project mentality.

Interviewer: How do these “model companies” to you tackle this?

Respondent: Everything is under their radar. And they don’t acquire what they cannot control by themselves.

Interviewer: What if the owners passed away or leave their position?

Respondent: Everything stops there. They are one-man companies.

Interviewer: How about creating nation building corporate construction companies?

Respondent: That is a serious point we should work on. The absence of such companies is creating a loss of national memory. As a nation this is our failure.

Interviewer: How could it be done?

Respondent: We should work on culture. Also the government should encourage those companies striving to create well-designed corporate construction companies. Also all stakeholders should work for the betterment of the industry.

Interviewer: You have repeatedly stressed the value of culture for transforming the construction companies. What should be done to positively affect the culture for the required transformation?

Respondent: University level studies should incorporate ethics as a course. The students should know how positively the construction industry could contribute to national growth. Also, the leadership and culture of top managers of our companies need to be improved. I noticed this in some incidents. The same carpenters who used to work in our company become very productive immediately when they join an international company. In my opinion, the leadership quality of the international companies was the reason for the change in the work culture of the carpenters. Also cultural change could be acquired if the new changes are accompanied with rewards. If productivity of a carpenter is registered to be much higher than the standard, it should be rewarded.

Interviewee **5**

Organization **Construction Company**

Respondent Occupation **Planning and Monitoring Director**

Interviewer: Good Morning. Thank you for your willingness to participate in this interview. Before going to the discussion, Could you please give me a brief overview of your academic background and experience in the Ethiopian construction Industry?

Respondent: Thank you. I have my BSc in civil engineering then acquired MSc in Construction Management. I have been working at different construction companies and consultants for the last 10 years. Currently I am the planning and monitoring director of a Grade I Construction company.

Interviewer: How do you explain the competitiveness of local construction companies with international foreign companies working in the Ethiopian construction industry?

Respondent: In my opinion the local contractors are not competitive with the international companies even if they are given similar platforms.

Interviewer: What do you think is the reason?

Respondent: We have the usual culture of doing construction works in a “business as usual” way. If we don’t change that mentality, we cannot wake up today and become competitive in terms of time, quality, cost and other aspects. We have also planning, implementation and technological draw back issues.

Interviewer: Do you mean that they need a redesign?

Respondent: No doubt. They need to craft strategy that could make them competitive. The companies should know their weak spots and design a strategy to address that.

Interviewer: Is there any such formal strategic document prepared by the local construction companies?

Respondent: They have a strategic plan but not a realistic one. For example, I used to work in a construction company where its strategic document was prepared by a group of renowned Professors and Ph.D. holders. But project members are not much involved. Projects are not seriously considered in the strategic document preparation. This seemingly “picture perfect” document faced a serious challenge at the implementation phase since the staff and project members didn’t internalize it from the start and projects were not given the expected priority in it.

Interviewer: Do you think the current organizational structure of the construction companies support project works? How are project tasks performed?

Respondent: We have a strong matrix structure. Every head office department has its representative on projects. After a strategic document is prepared, some try to prepare an organizational structure that considers the strategy. Similar to strategy, the problem is faced in the project implementation phase. We don’t have the mechanism and culture to sit and design project processes that line up with the strategy before commencing the project. We just become submerged into the routines of project works.

Interviewer: Do you notice construction companies define project management processes?

Respondent: They have not actually incorporated all of the PMI processes. The incorporated processes usually are the processes of the different departments. But I am not sure even the placed processes have brought an actual positive impact or not. Project members mostly communicate only with their project managers and their head office superiors. There is no much-recognized formal team at projects with a clear linkage and communication procedures. Due to the absence of such teams, projects are not performing as expected. For instance, a construction engineer might be

encountered with a variation work but due to the absence of teamwork, the contract engineer might not get this information and missed it in payment preparation phase.

Interviewer: How is the human resource element of the construction companies being handled considerate of projects?

Respondent: Fortunately the company I used to work is famous on human resource development. It has got its own centre of excellence. There were continuous annual capacity building trainings on summer time from executive managers to project team members. There is as such turnover of professionals and skilled labourers from the company side since they usually become transferred. Also there is no much voluntary turnover by the employees. But if the transfer is to another geographic location, the employees themselves sometimes are forced to quit the job.

Interviewer: How are the upper mangers of construction companies communicating with their project core team?

Respondent: They mostly communicate through meetings and progress reports. Meetings at different levels are common in the company. There are daily and weekly reports. There is an internal business process document explaining about the details of communication.

Interviewer: How about the behaviour or culture of the organization you mentioned?

Respondent: The Company I used to work was known for timely delivery of projects but sorry to say at the expense of quality. That unbalanced culture of rush neglecting quality has damaged the organization a lot.

Interviewer: Are the project goals aligned with the organizational goals?

Respondent: They don't contradict since one of the targets of the organization in the strategic document is customer satisfaction. The satisfaction of customers which is the

goal of the project is given high priority and become aligned with the organizational goals.

Interviewer: Do you think the upper managers of the organization support the project core team?

Respondent: Yes. Usually the upper managers get the project status on daily basis from the project core team. Then accordingly the upper managers will share tasks to support the projects. But this is usually done when the project is started and critically needed for some reason. But there is an issue of continuity of this support.

Interviewer: Is there any separate Project Management Office?

Respondent: Not separately. We have the Engineering department working on this. Specifically the operation division is the main responsible party for projects.

Interviewer: You have mentioned that your organization has worked on strategy, structure, process, human resource and behaviour. Having this in mind, do you believe that this organization could be competitive with international ones?

Respondent: I highly doubt it.

Interviewer: Why so?

Respondent: This is we don't have the work habit and ethics to the job. We usually tend to work things as it was previously done. We have also poor ethical background like financial ethics. The change should start from our mind setup. As an example the placed financial system is usually failing at the implementation phase. The funny thing I noticed is that if the people are not changed, they will try to change the system itself back to their traditional way. The companies are also not fully committed to establish a proper project management processes at their companies.

Interviewer: In your opinion what measures should be taken to redesign the construction companies and make them competitive?

Respondent: First the shareholders and owners should take their time to think about their organizations. They should get knowledge from best practices of international companies. They can do these by working with renowned International construction companies on joint venture modality to know how those companies successfully implement what they design. The other thing they should work on is how to ensure that all the company members at the parent organization and projects are on the same page through meetings and trainings. Also they should evaluate the implementation of their strategies, structures and processes on the ground.

Interviewee **6**

Organization **Construction company**

Respondent Occupation **CEO**

Interviewer: Good evening. Thank you for willingness to participate in this interview. Before going to the discussion, Could you please give me a brief overview of your academic background and experience in the Ethiopian construction Industry?

Respondent: Thank you. I am a civil engineer and have an MBA. I have been working for the last seventeen years in the construction industry. Among those years, I have mostly worked at one company at different levels to my current CEO position.

Interviewer: How do you see the competitiveness of local construction companies with international foreign companies working in the Ethiopian construction industry?

Respondent: If they are given the same platform, finance and other resources they can be competitive. But they need to look to themselves and be transformed.

Interviewer: You mean in their current organizational setup?

Respondent: Yes, they need to revise their organizational set up. But they think they need a lot of money to redesign their organization. The finance required might not be big. The main thing is they need to believe on the benefit they would get if such change happens and get ready for new approach.

Interviewer: Let us start from strategy. Do you think they have a strategic document showing the link between projects and the organization?

Respondent: Yes, but it is not well prepared. It is a copy-paste thing. And nobody refer it after once it is prepared.

Interviewer: Are project goals clearly linked to organization's strategic goals?

Respondent: The link between the organization and its projects are linked through developing the project strategy. The internal cost target and completion milestones are set by the upper managers and the project team in consideration of the objectives of the organizations' strategy. The project will then develop its own strategy and receive an approval by the organization.

Interviewer: Does your organization consider project management processes defined by PMI? How about project core teams?

Respondent: Yes. We have a document that incorporates all the processes defined by PMI. We call it the Master sheet. Projects are evaluated for their performance in executing these processes. We actually do not have a continuous and formal project team. They will be assigned as task forces to do some unique works only. Otherwise they meet informally which is why scapegoating is common. Everyone tries to blame others.

Interviewer: How is the structure of the organization and he projects?

Respondent: It is a weak matrix structure. The head offices departments have their representatives at projects. Also we have a flexible structure for projects. It can shrink and expand as per the size of the project.

Interviewer: Do you have a separate project management office that bridges the organization with its projects?

Respondent: No it is not separate office. There are contract and operation departments assigned to support projects. We are planning to have such office when we get mega projects.

Interviewer: How do you explain the behaviour of your organization?

Respondent: We have a very continues communication culture. Also we are mostly known for delivering projects with minimum cost and quality work. Sorry to say we known by our delays in finalizing projects.

Interviewer: How are you working on the human resource management of your organization?

Respondent: We give serious attention on retaining the employees. We have designed the means to check the turnover of employees. We have a minimal turnover of employees. Regarding skilled labourers we transfer them to other projects. The unskilled employees will be terminated as the project is completed. Usually the finishing works are subcontracted to other partners. We have also a unique performance measurement method of employees.

Interviewer: Do the upper managers of the construction companies give support to project team members?

Respondent: There is a continuous linkage of the organization with its projects via the corresponding departments. Those upper managers also visit the projects regularly.

Interviewer: How is your organization handling changes due to the nature of projects?

Respondent: We are very adaptable to change thanks to our strategy. The strategy we have allowed us to be adaptive to changes. The strategic document to be powerful in such cases should be prepared in-house with technical advice of consultants. Stakeholders are also involved in our strategic document preparation.

Interviewer: Some argue that fear of the turbulent environment has demoralized us not to prepare strategic documents. What is your opinion on this?

Respondent: There is a saying “Failing to plan is planning to fail”. This is due to misunderstanding of a strategic plan as “static” thing. We follow the living strategy approach. Also they don’t have a flexible organizational structure. Not having a strategy

is like being in a ship and not knowing in what direction you should go. They are giving pretexts not to commit themselves. The question should be asked prior to strategy is “Do they have vision and mission?”

Interviewer: Some argue and say “we will have 2 or 3 projects and complete them. If we go beyond this and start to grow, we would fail like the others.” What is your opinion on such attitudes?

Respondent: There is a famous Ethiopian saying interpreted as “You won’t stop going to bed in fear of having dreams”. If the interest of the company shareholder is getting only a personal financial return, even one project is enough for him. But things are different for some people who strive to build a nation building company.

Interviewer: In your opinion what measures should be taken to redesign the local construction companies and make them competitive project-based organizations?

Respondent: The first thing the local firms should do is be ready for change, to design and implement scientific ways of running a construction company. In should start from having a vision and mission. Then a strong commitment is required by the shareholders to design and implement the concepts you raised like strategy, structure, and others. Otherwise, the current dominance of stakeholders of projects would not stop. The contractors’ poor performance is letting stakeholders of projects have full control of projects. Every project of the construction companies seems to be too focused on the project owners’ interests. Due to this, the construction companies seem to float without an identity. The government should also value construction firms who are trying their best to establish a proper company that will benefit the nation. The thing you should not forget if the government fully opens the market to the world, international firms who are efficient and effective will surely come to the market. Those firms have a minimal loss due to mismanagement. The bid prices of such companies would be lower and preferable. This would damage the local construction companies who are not ready for change.

Interviewee **7**

Organization **Construction Firm**

Respondent Occupation **Managing Director**

Interviewer: Good afternoon. Thank you for your willingness to participate in this interview on your busy schedule. Before going to the discussion, Could you please give me a brief overview of your academic background and experience in the Ethiopian construction Industry?

Respondent: Thank you. I have acquired BSc in civil engineering and have an MBA. I have been working at different construction companies and consultants for the last 20 years, mostly at top management levels. Currently I am a managing director of a construction firm which is founded by me 10 years ago.

Interviewer: How do you explain the competitiveness of local construction companies with international foreign companies working in the Ethiopian construction industry?

Respondent: The local contractors are not competitive in the current context.

Interviewer: What do you think is the reason?

Respondent: The first and utmost critical thing is the absence of the global project management knowledge at the companies. Also as a nation we have low labor efficiency and poor time management.

Interviewer: Is there any formal strategic document prepared by the companies?

Respondent: Recently, some construction companies are trying to have a strategic plan prepared in alignment with government long term plans. But its quality is poor.

Interviewer: Do you think these strategic plans support project works and are realistic?

Respondent: Theoretically they have placed something on the strategic plan that links projects with the head office. But it is not implemented as planned.

Interviewer: What is the reason for the construction companies for not having a proper workable strategic plan?

Respondent: This is mainly due to the absence of a vision and mission and the lack of commitment to them. As for me strategy is conditional to the external and internal conditions. The main problem is not having a clear vision and mission. The other issue that discourages not to design a strategy is the external corruption, unethical business environment, resulting unfair bid competitions. Not much interest is seen by company owners to have a strategy and the corresponding proper procedures. They consider it as a waste of time and money.

Interviewer: What should be done to improve the unethical environment?

Respondent: This is a national issue and could not be resolved by just construction companies. There should be a major change of attitude in all citizens. Lack of commitment and searching short cuts for financial success have become the identity of this generation and led them to be immersed with corruption. To improve this educational policy should be revisited. The project managers that are accidentally appointed need to be trained in project management and other areas to be an ethical and capable manager.

Interviewer: Some disagree on this view by referring international construction companies using the same local manpower but with much more successful performance of projects. How do you see this argument?

Respondent: Hahaha. You got me. Besides what I mentioned the capacity, ethics and work discipline of the leaders of the companies also matters. The upper managers with such charisma could change the behaviour of the organizations.

Interviewer: Is there any organizational structure that could implement the strategic plan?

Respondent: They usually use a matrix structure. They put some charts which nobody would stick .It is not also prepared in alignment with the strategic plan.

Interviewer: Theoretically they have placed something on the strategic plan that links projects with the head office. But it is not implemented as planned.

Interviewer: Do you notice construction companies define project management processes?

Respondent: How could someone define project management processes while unaware of it? The Ethiopian construction company top level managers reached to their current positions due to their technical capability and experience. Most of them have not taken any project management training. But some might have included the processes at different departments coping from other documents. But the proper implementation of these processes is questionable. We don't have the discipline to continuously adhere to such defined processes as a nation.

Interviewer: Are the upper mangers of construction companies communicating with their project team?

Respondent: The upper managers communicate mainly with the project manager mainly through phone calls, progress reports and meetings. The communication is much better nowadays thanks to the boom of social media platforms. Regarding the project core team you raised, it does not exist formally. Project team members informally communicate to get solutions to specific problems.

Interviewer: Do the construction companies have a separate project management office??

Respondent: I think only very few big construction companies have such separate office.

Interviewer: Can you explain in detail how a typical project is organised from planning to implementation?

Respondent: When projects are acquired, assessment of the projects site, assignment of key personnel, material resourcing and mobilization are the initial things commonly done. In the meantime the construction works would be started also.

Interviewer: How is the human resource element of the construction companies being handled?

Respondent: The professionals and skilled labourers are usually retained for long period. Obviously the daily labourers will be terminated as the project is completed. Currently they are giving more attention to involve the local community on their projects.

Interviewer: Do you think that the construction companies have their own identity?

Respondent: No. They are not properly organised which makes it difficult for them to develop a proper identity. Rather they are mostly known by their chaotic environment due to the absence of a proper structure.

Interviewer: In your opinion, what should be done to redesign the construction companies to tackle the drawbacks we raised?

Respondent: The current management approach of the local construction companies is very traditional. Primarily the companies need to clearly define their vision and mission. Then the company owners should start to empower their management and stop getting too much involved in the routines. The management and all employees including project members should get benefits as the company and project became profitable. Better make key staffs shareholders and make the company a shareholders company than a private company. If the construction companies do so, they can even become competitive regionally and then worldwide.

Interviewee **8**

Organization **Consultant**

Respondent Occupation **General Manager**

Interviewer: Good afternoon. Thank you for willingness to participate in this interview. Before going to the discussion, Could you please give me a brief overview of your academic background and experience in the Ethiopian construction Industry?

Respondent: Thank you. I am a civil engineer. I have been working at different Grade I construction companies for the last thirty years. I have worked from as an office engineer, site engineer, Project manager, Deputy General Manager and General Manager Positions.

Interviewer: How do you see the competitiveness of local construction companies with international foreign companies working in the Ethiopian construction industry?

Respondent: I think this depends on different things. The international companies have different culture, attitude and style. This happen since the locals think locally and the internationals globally. They could not have similar project performing behaviour. But the local construction companies need to compare themselves with those international companies and can improve in time. There was a local construction company in Ethiopia in the 1990s. That Company was taking lessons from the international construction companies including the way they manage their projects and all their work flows. It is difficult to generalize but we are not yet there to be competitive. In my opinion, the main thing the locals should do is work on their organizational behaviour. Is their organizational behaviour fit to the external environment? The local and the internationals companies are not reflecting to the same external environment similarly.

Interviewer: Does this mean that the local construction companies need to redesign themselves?

Respondent: Yes. They need a serious fundamental change. Leave the competition with the international companies, they need to have an institutionalized thought and frame to prevail and be transformed. Their company should be able to run by other people as an institution. There few companies who seem to be doing well as long as the owners could breath. For your surprise some companies get staked when the owners get a cough or cold. But there are very countable companies who are trying this to establish a generation passing institution. A company I knew was trying this delegation trend by empowering people and it was good. Two things should be done for empowerment. The one who empowers should tolerate when the empowered make mistakes. The empowered should also be willing to take responsibility. But the effort lacked continuity.

Interviewer: Let us start from strategy. Do you think they have a strategic document showing the link between projects and the organization?

Respondent: They might have just the document. I highly doubt its quality. In my opinion what gives life to a strategic document is the strategic thinking. Strategy is like a ladder, you should think where you are and where you are going. I fear that there is no understanding of the strategic concept itself.

Interviewer: Do the organizational structure of the local construction companies support project works?

Respondent: There is no such big problem in designing the structure. The basic functions are there. They mostly use matrix structure. The question is if they are abiding by the structure or not. I don't think so. For example, if there is a box for a project manager in the structure and if the company owner or Engineer always bypasses and gives orders to the project team members, having the structure is meaningless. Symbolic project managers are placed as per the structure, but usually, their superiors are doing their jobs. The funny part is the upper managers don't trust and abide by the structure they designed. They say this is due to their lack of confidence in the capacity of their project managers.

Interviewer: Are the project members you mentioned formally organised?

Respondent: Not at all. There is no as such a formal project core team. Every project member wants to satisfy his two bosses. They are busy communicating with their corresponding head office department managers and the project manager.

Interviewer: Do you notice construction companies consider project management processes defined by PMI?

Respondent: They consider it partially. There are major five phases in project management, Project initiation, Project planning, implementation, monitoring & evaluation and finally closing. If the company is doing planning all the body of knowledge areas like quality, cost and others should be considered. We don't have the trend to do this. There is knowledge gap by the upper managers and project on this project management area. If they want to design planning they would consider Gantt chart preparation and scheduling only. They don't consider the other body of knowledge areas. Also all project stakeholders should know the concept and work as team to have a smooth project process.

Interviewer: Do the companies have designed information technology platforms to communicate regarding project tasks?

Respondent: We are currently using social Medias to post progresses and to discuss project problems. But there is well designed system in performing project tasks.

Interviewer: How about behaviour of construction companies towards becoming a competitive Project-based organization?

Respondent: Organizational behavior is like a human behavior. Behavior is like an identity. It is the reflection of what you think. For organizations behavior could be known by the answers of questions like: "Do they continuously plan; do they prepare strategic plans; do they work on human resource development; what is the leadership style in the

company and other similar questions. The behavior as for me depends highly on the strategic thinking.

Interviewer: What should be done to create a behavior that could help to create a full-fledged PBO?

Respondent: If the companies work on their processes and human resource a behavior would be created along the way. Strategy and structure are the hard S's which could not be implemented without the Soft S's like systems and shared values. It is the positive effort by all the employees from top to bottom towards achieving company goals. Let us raise team work. It is like soccer team. The players of a soccer team might have a personal fight, but when they go to the game they should leave that and play as a team. How is team work in our projects? Not good. Companies should properly study on how to create an organizational behavior that could transform their organization into full-fledged PBOs.

Interviewer: What could improve the human resource management of your organization to be able to contribute towards making your organization a competitive Project-based organization?

Respondent: The human resource development cannot only be considered at company level.

The social environment where you pick the employees matters a lot. If you collect water from a much polluted pond, the cleaning process would be very time taking and costly. The human resource pool is highly polluted by and better be cleaned by training and development. Also how clean are the upper managers themselves? This is the biggest challenge of construction companies, to get a clean upper manager that could devise an approach that can clean the other employees. In my opinion what matters is the leadership style of the top managers. Leadership changes everything. If the top manager as a leader creates a good environment, turnover of qualified staffs would be minimized. This does not mean creating replicas, but employees with different opinions but with common goal. The attitude part of a company culture could be changed by

leadership. Most employees are leaving their job due to conflict with their superiors. If there is good leadership, head office and project employees stay in the company even if they are transferred to other projects. The work environment seems like the manager. Employees do not work for the whole month thinking about their salary. The other thing is companies should prepare their strategies in alignment with the employees' strategy that could create strategic human resource relationship. Also employees inclined to work with companies with strategy. The human resource department should be given serious attention. The current human resource departments are busy with routine things.

Interviewer: In your opinion what measures should be taken to redesign the local construction companies and make them competitive project-based organizations?

Respondent: Primarily, the company owners should think of establishing institutions. They have founded a company. Thank you for that. Let them be one of the employees and see the company without their interference.

Interviewer: But some people argue that they have tried to delegate people but failed?

Respondent: No, they didn't give whole heartedly. They should also tolerate mistakes and encourage the delegates. I really want to thank my previous company owners for trusting us at that time. If the top managers are employees are trusted, they will surely work as their own company.

Interviewee **9**

Organization **Construction company**

Respondent Occupation **CEO**

Interviewer: Good morning. Thank you for your willingness to participate in this interview. Before going to the discussion, Could you please give me a brief overview of your academic background and experience in the Ethiopian construction Industry?

Respondent: Thank you. I have got my BSc in civil engineering from AAU. I have been working at different construction and real estate companies for more than 20 years, mostly at top management levels. Currently I am the CEO of a Grade I construction company.

Interviewer: How do you explain the competitiveness of local construction companies with international foreign companies working in the Ethiopian construction industry?

Respondent: The local construction firms are not currently competitive in the market. This is noticed in their performance on different projects. Our poor organizational setup, lack of proper financial management, absence of qualified manpower; traditional work methodologies, and poor work culture are the major reasons for this in my opinion. There is also a major shortage of skilled project managers who can manage mega-size projects. Some project managers are very good at the technical part but miss a leadership quality. Most project managers do not have the expected project management and leadership skill and knowledge to manage their projects. The government also seems to lose its trust in the local contractors and their project managers and giving projects to the Chinese and other Asian contractors. This is a very sad story.

Interviewer: You mean, they need to be a redesign?

Respondent: Yes, off course otherwise they will be out of the game soon.

Interviewer: To start with, do the companies have any formal strategic document?

Respondent: They have a strategic plan prepared for the sake of just having it. The document preparation has a problem; it is prepared by external consultants with minor involvement of the company staffs. The leading role should have been taken by the company staff. The quality of the documents is also questionable. Some owners also are not interested in it. There is a company owner which I used to work rejected the idea to prepare a strategic document. He literally said “we don’t need it”.

Interviewer: Do the companies craft a corresponding organizational structure that could enable them to execute their strategic plan?

Respondent: There is an organizational structure chart in almost all construction companies. But the structure is not aligned with the strategy and processes. That is what I faced in the previous company I used to work. We had a nice strategy but the problem happened on the structure. The company I am currently working is trying to design its organizational structure in alignment with its strategy.

Interviewer: Do you notice construction companies consider project management processes defined by PMI?

Respondent: Firms only give due attention only to internal processes related to project material purchases, mainly the procurement and logistics parts. Regarding the whole knowledge area and processes of project management, we have a noticeable gap starting from the top management to project levels.

Interviewer: Do you think that the construction companies have a behavior that could adapt to changes easily as project-based organizations?

Respondent: No they are not easily adaptive. This happen since we don’t have the culture to be always ready and easily adopt when something new happens at projects. This even worsens when a new project comes into picture.

Interviewer: How is the human resource element of the construction companies being handled?

Respondent: If the employees are hired at project levels, mostly they would be terminated when the project is completed. But if they are well performing professionals, they head office will keep them and give a temporary assignment until a new project is acquired.

Interviewer: Are the upper mangers of construction companies properly communicating with their project core team?

Respondent: No upper managers only contact the project managers. Also there is no properly organised project core team. The top managers mostly communicate the project managers through progress reports. Almost all construction companies have at least monthly project reports. Some has even a daily report. Social medias are also been much used recently to follow up projects. The other common communication channel is verbal or telephone calls. The problem is we don't have the culture to be disciplined and continue the communication to the end. Also as the company misuses the payments of the project and face shortage of finance the communication will start to deteriorate. Also if there is a good understanding between the project member and the upper manager in their dialogues, the communication would be continuous.

Interviewer: Are the project communications supported with information technology?

Respondent: Emails, Social Medias like telegram are being used to some level. But there is no software designed for project operations.

Interviewer: Do you think the current organizational structure of the construction companies support project works?

Respondent: Currently some companies are giving attention to this. The company I am currently working has different types of projects. We have one mega project which is self-standing where the head office supports only on budget releases and monitoring.

The other types of projects are those who have close daily relationship with the head quarter. Almost all companies knew that they would not exist without projects; the problem is how to implement it on the ground.

Interviewer: How about a separate project management office that bridges your organization with its projects?

Respondent: No, it is being done under the construction department. But we are planning to design and implement such a separate PMO.

Interviewer: In your opinion what measures should be taken to redesign the construction companies and make them competitive?

Respondent: As for me the critical focal point is the human factor since all resources are being managed by the human resource. Even if you don't have sufficient material and financial resources, the human resource can design to get the resources and continue the project. It is the people who are going to fill the boxes on the organizational structure. How many are ready to receive new knowledge and be able to transform our companies with it? So working on the human resource is ultimately investing in the organization.

Interviewer: How could we have such competent human resource?

Respondent: As a nation, we should start investing on the children. We need to develop them to be confident and creative that could fit project-based organizations. The educational system also needs to be revisited.

Interviewer: But some argue that using the same existing human resource, international companies would get a very different result. What do you think is the reason?

Respondent: Don't forget that the problem in the human resource I mentioned also applies to those of us who are in the upper management. Are we actually good leaders? Do we make timely decisions required for projects? Let me tell you something we give

directions to use two shifts for projects. Only one project manager, who is a strong leader, has implemented it. The other thing that should be done is to work on sharing technologies, skills and good practices. The Ethiopian project management institute should take the frontline to do this. The local construction companies are the junction, to transform themselves or become extinct.

Interviewee **10**

Organization **Regulatory body**

Respondent Occupation **Department Manager**

Interviewer: Good Evening. Thank you for willingness to participate in this interview. Before going to the discussion, Could you please give me a brief overview of your academic background and experience in the Ethiopian construction Industry?

Respondent: Thank you. I have MSc in civil engineering. I have been working at different governmental institutions for the last thirty years at top management levels. I was mostly involved on capacity building programs of local construction companies.

Interviewer: How do you see the competitiveness of local construction companies with international foreign companies working in the Ethiopian construction industry?

Respondent: Definitely, they could not be competitive.
Interviewer: What do you think is the reason for this?

Respondent: There are a lot of reasons for it. As for me the absence of proper organizational structure, project management knowledge and skills, discipline and lack of sufficient knowledge are the major factors. When I say lack of project management skills it starts from the top management and goes to every project staff. Also the human element is losing its ethical values and don't have the discipline to adhere to rules and regulations. The national level poor moral culture and behavior is reflected on the companies. The other issue is the absence a proper educational system resulting very incapable manpower to all industries including the construction industry. These days the manpower coming out from universities is incapable in many aspects. The government have also accepted this problem and have decided to improve the quality of education. The technical poor performance of graduate professionals is noticed in many projects. Also the top managers don't have the capacity to change the culture and trend of their

companies. Having such manpower, structure, insufficient knowledge of project management you cannot expect the local construction companies to be competitive.

Interviewer: It is good that you have raised so many areas. Let us start from strategy. Do you think they have a strategic document showing the link between projects and the organization?

Respondent: Some have it, even though its quality is questionable. But it is good that they have it. The problem is they don't abide to it on the implementation phase. We don't consult our strategic plan at the execution phase. We should start to give value to the strategy before starting the preparation. We love to jump to routine work. Regarding its linkage with projects, they consider projects as a simple tool to an end. They don't incorporate them in their strategy seriously as a company working with projects.

Interviewer: Could you please further elaborate this issue?

Respondent: First of all the companies are inherently one-man companies. The upper managers are mostly symbolic. Every major decision regarding projects is usually made by that one-man (the owner).Even the name of the construction companies is named by their name. Sometimes it becomes a family business where decisions are made by the family members. In either case the upper managers are not really acting as true managers. Sorry to say, it is the owner and family members who are communicating with the projects. A non-autonomous upper manager is not expected to support projects at full swing. There are few one-man companies in Ethiopia who are relatively successful but only in smaller projects. They do the major things by themselves. They acquire only two and three projects. They do it nicely. The problem is such companies' growth is limited. Their shoulder cannot carry bigger projects. The two or three family companies who passed the 10 year syndrome and become successful belong to this.

Interviewer: Could the two or three companies be considered as successful? And could these companies be competitive with international ones?

Respondent: I think they are successful in comparison with the other local companies in small sized projects. Those companies are known to acquire just few projects and deliver them with quality and in time. They are focused on segmented market and are known for their subcontracting strategy. The have very strong partnership with reliable subcontractors. They have their own strategy for their niche market.

Interviewer: Will the local construction companies face severe challenge to be competitive with the current and upcoming giant international construction companies?

Respondent: I don't think that those companies could compete with the international giants to perform massive mega projects. The government should give an umbrella to hold the international companies from being fully functional in the country at this time.

Interviewer: What should be done by the local construction companies in the "umbrella" period you mentioned?

Respondent: Each company needs to carefully perform a diagnosis of its own company based on the benchmarks mentioned at the start of our discussion. Then they need to make themselves ready for a transformation. It should start from the top management. They should stop being change-resistant. The common problems I noticed are poor work discipline, poor operational management capacity and other factors. For me the major dimension that should worked is the human resource management. If they don't have ethical and country loving employees, any investment deployed to transform a company is futile. For this the leaders should be exemplary and follow "the leading by example" approach. Let me tell you some incident I faced while I was working in a big governmental institution. A construction company owner who used to come to our office complained that the local construction companies are losing the market. The manager of our institution told him that the government main concern is to get the deliverables like roads, buildings and others in time and with superior quality. That man laughed and said "If you want just an outcome, please bring also the leader of the nation from China." This example clearly shows the value of leadership to the transformation of companies and nations as a whole. Also don't underestimate external factors, since a construction company is not an island. Companies are working in a

country where the macroeconomic condition is volatile. The regulatory framework of the construction industry is not clear and comprehensive. How could they think about long-term transformation in such conditions? The external economic factors seriously affect local construction companies but should not be an excuse for all their inefficiencies. The other thing that needs to be considered by the locals is to think globally and try to become an international company. An international company could have the opportunity to specialize and subspecialize because of its access to a wider market. May be the locals should consider to prepare a strategy to become international companies themselves. The construction companies in their different associations should work with the government on road maps and other strategic issues. They need to have a strong national construction council. The government should also need to see the construction companies positively and support them.

Interviewer: How do you see the organizational structure of the construction companies?

Respondent: They put a chart on their walls not fully understanding its value and how it should have been designed. The main production unit of construction companies are projects. They neglect this and mainly focus at their head office departments. They should not consider it as an extension. It is part of them. As for me the company structure should be prepared including projects. Also don't forget that it should also need to consider the future plan, strategy.

Interviewer: Regarding projects, have you noticed project teams in action?

Respondent: The bigger companies use a matrix structure and the smaller ones use a functional structure. Those who use a matrix structure, departments usually assign their staffs on the projects. Those people report both to their project managers and their respective department heads. There is no formal project team but project members meet for some specific assignment as required.

Interviewer: How do you see the competency of the project managers?

Respondent: As I have mentioned earlier, almost all the project managers have not attended any formal project management or leadership trainings. They are mostly civil engineers and building engineers. Also they don't have financial and management skills. Due to these, they are not competent to lead and manage their project as expected. The government have nowadays started construction technology and management stream.

Interviewer: Construction companies face new environment when they acquire new projects. Do the companies easily adopt tor such changes?

Respondent: They have not managed to adapt to changes easily. The experience and knowledge acquired from other projects are not well kept in the organizations. This is becoming a more serious problem due to the current high turnover of employees. Projects are time-bounded, have a start and an end. The project staffs needs to adjust them to this trend. But they do not seem to adapt easily to these repeated changes. There is a high turnover of project staff due to this reason. The experience and knowledge acquired from other projects are not kept in the organization due to the prevalent high turnover of employees. A new project in a new environment without experienced company staff is a common challenge. In my opinion, this can only be addressed by retaining knowledge at projects through designing proper process and documentation system. The problem is the upper management considers the implementation of information systems too expensive. But the construction firms are missing a lot due to the absence of a digitalized documentation system. There is no proper database on material, labour, and other resource prices: failing in bids. Best practices and lessons from previous errors at projects are not digitally documented for learning purposes. The construction firms are missing a lot due to the absence of a digitalized documentation system at projects. The project processes and all the documentations need to be supported by ICT.

Interviewee **11**

Organization **Regulatory body**

Respondent Occupation **Deputy Director**

Interviewer: Good Morning. Thank you for your willingness to participate in this interview. Before going to the discussion, Could you please give me a brief overview of your academic background and experience in the Ethiopian construction Industry?

Respondent: Thank you. I have acquired MSc in Construction Technology and Management. I have been working at different construction companies and consultants for the last 19 years mostly at government institutions. I am currently the deputy director of a governmental regulatory body.

Interviewer: How do you see the competitiveness of local construction companies with international foreign companies working in the Ethiopian construction industry?

Respondent: Currently the local contractors are not competitive almost in all dimensions with noticeable delays and poor quality of works at their projects. Their poor performance can be noticed by their poor project maturity level. The surprising part we notice is a company established before a decade works similarly with a newly established company. This shows that the project management capacity of the construction companies is not improving at all. Also the previous Grade I companies are becoming extinct and new ones are emerging. Due to this fear of a possible failure of their contractors, the project owners have the upper hand. Sometimes, they interfere with the internal management of the contractors. This has made the shareholders of the construction firms unable to plan for long term and manage their projects in their approach. One of the reasons for their failure is the registration procedures which allowed nonprofessional entry to the industry and get a Grade I license automatically. The problem with the non- professional contractors is their lack of full attention to the construction industry. They will shift to their other businesses if their construction business doesn't go well. They don't plan for long term specifically at their construction industry investment. No strategic thinking at all. Also if the licensing approach had been

progressive, the interest of non-professionals entering to the industry would minimize considerably.

Interviewer: Is there any formal strategic document prepared by the companies?

Respondent: I think many of them don't have a workable strategic plan. Also the main problem for those who have it is they don't refer to it. Things are usually done both at the organizations and their projects in a business as usual way.

Interviewer: How do you see the organizational structure of the construction companies?

Respondent: I think they have some chart. Mostly use a matrix structure. Also people are also assigned to some of the posts. Similar to the strategy, the problem lies on adhering to the designed structure. Surprisingly, the first person to contradict the designed structure is usually the company owner. Truly speaking the company owners or their family members are currently acting as the department managers and project managers. Following their foot step, department managers interfere on the the work of the project manager.

Interviewer: In your opinion are the organizational structures designed in a way to support project works? How about project teams?

Respondent: I think they have also a project organizational structure but things are not done as the designed structure. The funny part is as his position is occupied by his superiors, the project manager usually interferes on the works of his subordinates. This is why unnecessary arguments are noticed at project levels. Project teams could only follow when every project team member freely works his assigned position. So every project member should first need to work and be happy at his position before creating formal project core teams.

Interviewer: How about a separate project management office that bridges parent organization with its projects?

Respondent: No, it is at an individual level. They usually have a symbolic project coordinator at organization level that tries to link projects with the organization.

Interviewer: Do you notice construction companies define project management processes?

Respondent: I think that they don't even have the knowledge about PMI and its knowledge areas. The contractors are busy with the tricks to gang up bids. The PMI issues are wrongly considered as an academic subject. The knowledge gap is very clear top down. I am not talking about skills rather the foundational project management knowledge.

Interviewer: Do you think that the construction companies have their own identity?

Respondent: As for me, some previous Ethiopian construction companies had their own identity. For example, Company X is known for quality and Company Y for doing massive construction works. They had their own project culture. But there is no single recent company I know with an identifiable identity in their projects works. I think the struggle to acquire projects has made the contractors busy with external issues. The other problem is the registration problem. Unprofessional people have invaded the construction industry which doesn't give much attention to system development. That is why the government is currently revisiting its registration protocol.

Interviewer: How are the upper mangers of construction companies communicate with their projects?

Respondent: They mostly communicate through progress reports. But the true reason for the report preparation is an obligation by external parties including clients and consultants. You can see this by the absence of feedback to project reports. Chaotic phone communication is common at construction companies and its projects.

Interviewer: How is the human resource element of the construction companies being handled?

Respondent: There is a saying “any employee in the Ethiopian construction industry has always his bag on his back”, being ready to leave the company at any time. There is a huge turnover of professionals. If you come to some company after three years, you would most likely find completely new staff. The way the human resource at projects is being handled lack something. This reassures my previous comment; if the unprofessional are leading construction companies, they won’t be concerned about the professionals.

Interviewer: In your opinion what measures should be taken to redesign the construction companies and make them competitive?

Respondent: There should be a fundamental change and the change needs full commitment by the company owners. They should be ready to transform their company into a big institution. The upcoming expected entrance of international giant construction firms would even make the industry very competitive. Now "Survival of the fittest" issue is at the front door. Also, project owners are increasingly becoming too demanding in their projects. Also, their request is changing frequently. For this, the contractors should be ready to be flexible for any unexpected changes and also design a system to learn from the previous project works.

Interviewee **12**

Organization **Governmental capacity building Institute**

Respondent Occupation **Director**

Interviewer: Good afternoon. Thank you for willingness to participate in this interview. Before going to the discussion, Could you please give me a brief overview of your academic background and experience in the Ethiopian construction Industry?

Respondent: Thank you. I am a civil engineer and have an MBA. I have been working for the last twenty two years in the construction industry mainly governmental institutions. I am currently a director of a governmental capacity building institute

Interviewer: How do you see the competitiveness of local construction companies with international foreign companies working in the Ethiopian construction industry?

Respondent: All stakeholders of the Ethiopian construction industry including the contractors do not seem ready to support their projects. The contractors do not have the clarity to work with which organizational structure, functional, matrix, or project-focused. They are mostly using a weak functional structure. The tasks to be performed at the head office and projects are not differentiated. Most of the decisions regarding the project works are performed at the head office level. Sometimes project managers are not even able to decide on small purchases. But the nature of projects has a sense of urgency and requires spot decisions. The project manager is not fully autonomous. We could surely say the local constructions do not have the trend to give the mandate to projects. I have seen some companies with very good structure and process documents, but not implementing them on the ground. With all the these circumstances, they are not competitive with the international contractors working in Ethiopia.

Interviewer: Let us start from strategy. Do you think they have a strategic document showing the link projects and the organization?

Respondent: This is a very fundamental question. When we talk about strategic document, we are talking about the very essence of the organizations. We are taking about vision, mission, objectives and values of the company. I doubt that the Grade I contractors don't know where they are going after reaching Grade I level. They don't have detailed knowledge of the construction industry supply chain (forward and backward integration). Almost all the contractors are fully dictated by the market. They don't have well defined vision. They are not clear of their mission, very essence of their existence. Do they know why they have established a construction company rather than some other business? I doubt. They have not understood the true value of a strategic document. They are mostly forced by external parties, including banks, to prepare it. We have a long way to go as nation.

Interviewer: How is the organizational structure of the local construction companies and their projects? How about project core teams?

Respondent: The organizational chart of the companies could be good. The problem is at the execution stage. The construction companies The head office staff do not keep in mind the true value of projects when they do their routines. They don't also choose projects based on their strategic value to the organization. Also, they don't give value to projects and their team members. To be frank almost all might not be even aware of the project core team concept. There are informal teams meant for specific special project tasks. These informal teams stay for short period of time only.

Interviewer: Do they have a separate project management office that bridges the organization with its projects?

Respondent: No it is not separate office. They might assign somebody to overlook the projects but not at an office level.

Interviewer: Does the organizations consider project management processes defined by PMI?

Respondent: We have nationally studied the construction project management maturity level of Grade 1 to 3 contractors and consultants. Sadly their level ranges between 1 & 2 out of 5. Level 1 company is uninformed about the processes and practice. Level 2 organizations are project-centric but not standardized and depend on the individual performance of project managers. Yes, there are very few firms that reached level 3. But most of the contractors are at the uninformed process level.

Interviewer: Do the companies have ICT platforms to properly facilitate project tasks and also have a proper documentation?

Respondent: No, before going to information system design, the work procedures should be clearly defined. As I have previously mentioned the processes are not yet defined by the companies to the expected level. But the companies need to define their work processes and then need to move on to the usage of a well-designed platform.

Interviewer: How do you explain the behavior of the construction organizations?

Respondent: It is a good question. In construction project management there are three different issues to be addressed: Principles, techniques and practice. The techniques are the tools and whereas practice refers to the actual implementation trend. Principles are the underlying concepts behind the practice. In our construction industry professionals do not want to ask the principle behind their practice. Nobody questions. People in the industry think practice is always right. Culture and values are among the principles of construction management. But we even internalize the culture after our practice not by the principles set. Someone working at different warm areas may finally sense adaptability when he goes to very cold areas. But if work more and more at such principles at company level, the culture of the construction company would be established. An organizational culture is like an immune system. A damaged organizational culture is like someone affected by an HIV virus. The immune system will be damaged. Information and decision making path works as per the organizational

culture. Look if the culture is damaged the decision making process would be highly damaged. Don't forget that construction projects as other projects are full of frequent decision makings. Are the construction companies are participatory and democratic? Are the Project managers autonomous? If not, the company is infected.

Interviewer: How is the human resource management of construction companies being handled?

Respondent: People are joining to the construction industry due to lack of other options. The construction industry belongs to the most unstable industry. There are two types of HRM, a strategic and operational HRM. The operational focuses on sourcing including recruitment. They mostly focus on the operational HRM which is mostly enforced contractually. The major problem in Ethiopian construction companies come with the strategic HRM. If a proper strategic document was initially available, it would have incorporated a strategic HRM.

Interviewer: In your opinion what measures should be taken to redesign the local construction companies and make them competitive project-based organizations?

Respondent: There is no other option, adopt or die .If we lose the local contractors, we will also lose very big socio economic benefit as a nation. The government has already identified the poor competitiveness of the local contractors and has designed a 10 year holistic program to work on their capacity building. This is why I said your study is a very timely study. The construction company owners need to be ready for transformation. The other problem is the poor construction industry leadership resulting different outputs on the same context. I also want to stress on the quality of our strategic document, structure and others .After all such documents are as good as their implementation. We need to plan to the end, for a proper execution.

APPENDIX VI: ANOVA RESULTS

A/ Relationship of antecedents of organizational design dimensions of full-fledged PBOs with type of organization of the respondents

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Project orientation	Between Groups	3.956	7	.565	1.068	.386
	Within Groups	91.014	172	.529		
	Total	94.970	179			
Project working	Between Groups	.534	7	.076	.155	.993
	Within Groups	84.774	172	.493		
	Total	85.309	179			
Fit	Between Groups	8.421	7	1.203	1.841	.082
	Within Groups	112.391	172	.653		
	Total	120.812	179			
Project culture	Between Groups	3.075	7	.439	.901	.507
	Within Groups	83.835	172	.487		
	Total	86.909	179			
Churn	Between Groups	3.465	7	.495	1.199	.306
	Within Groups	70.986	172	.413		
	Total	74.451	179			
History and context of the organization	Between Groups	2.334	7	.333	1.024	.416
	Within Groups	56.026	172	.326		
	Total	58.360	179			
Size	Between Groups	3.838	7	.548	1.163	.327
	Within Groups	81.085	172	.471		
	Total	84.923	179			
A shareholder versus stakeholder orientation	Between Groups	4.944	7	.706	1.517	.164
	Within Groups	80.078	172	.466		
	Total	85.022	179			
Control by behaviours or results	Between Groups	4.315	7	.616	1.287	.259
	Within Groups	82.386	172	.479		
	Total	86.701	179			
Uncertainty, dynamism and complexity	Between Groups	1.703	7	.243	.650	.714
	Within Groups	64.378	172	.374		
	Total	66.081	179			
Awareness and knowledge of project management	Between Groups	3.190	7	.456	.801	.588
	Within Groups	97.882	172	.569		
	Total	101.072	179			
Project core team	Between Groups	2.143	7	.306	.431	.882
	Within Groups	122.168	172	.710		
	Total	124.311	179			
Strategic project management information system	Between Groups	2.133	7	.305	1.161	.328
	Within Groups	45.150	172	.262		
	Total	47.282	179			
Dynamic capability and organizational learning	Between Groups	4.281	7	.612	1.464	.183
	Within Groups	71.871	172	.418		
	Total	76.153	179			
Upper management support	Between Groups	4.942	7	.706	.992	.438
	Within Groups	122.367	172	.711		
	Total	127.309	179			
Competency of project managers	Between Groups	1.175	7	.168	.314	.947
	Within Groups	91.873	172	.534		
	Total	93.048	179			

B/ Relationship between antecedents of organizational design dimensions of full-fledged PBOs and educational qualification of respondents

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Project orientation	Between Groups	.396	1	.396	.746	.389
	Within Groups	94.574	178	.531		
	Total	94.970	179			
Project working	Between Groups	.039	1	.039	.081	.776
	Within Groups	85.270	178	.479		
	Total	85.309	179			
Fit	Between Groups	1.121	1	1.121	1.667	.198
	Within Groups	119.692	178	.672		
	Total	120.812	179			
Project culture	Between Groups	.385	1	.385	.792	.375
	Within Groups	86.524	178	.486		
	Total	86.909	179			
Churn	Between Groups	.800	1	.800	1.933	.166
	Within Groups	73.652	178	.414		
	Total	74.451	179			
History and context of the organization	Between Groups	.714	1	.714	2.205	.139
	Within Groups	57.646	178	.324		
	Total	58.360	179			
Size	Between Groups	.311	1	.311	.654	.420
	Within Groups	84.612	178	.475		
	Total	84.923	179			
A shareholder versus stakeholder orientation	Between Groups	.469	1	.469	.987	.322
	Within Groups	84.553	178	.475		
	Total	85.022	179			
Control by behaviours or results	Between Groups	.334	1	.334	.688	.408
	Within Groups	86.367	178	.485		
	Total	86.701	179			
Uncertainty, dynamism and complexity	Between Groups	.581	1	.581	1.578	.211
	Within Groups	65.500	178	.368		
	Total	66.081	179			
Awareness and knowledge of project management	Between Groups	.890	1	.890	1.581	.210
	Within Groups	100.182	178	.563		
	Total	101.072	179			
Project core team	Between Groups	1.426	1	1.426	2.066	.152
	Within Groups	122.885	178	.690		
	Total	124.311	179			
Strategic project management information system	Between Groups	.005	1	.005	.017	.896
	Within Groups	47.278	178	.266		
	Total	47.282	179			
Dynamic capability and organizational learning	Between Groups	.305	1	.305	.716	.399
	Within Groups	75.848	178	.426		
	Total	76.153	179			
Upper management support	Between Groups	.037	1	.037	.051	.821
	Within Groups	127.273	178	.715		
	Total	127.309	179			
Competency of project managers	Between Groups	.609	1	.609	1.172	.280
	Within Groups	92.439	178	.519		
	Total	93.048	179			

C/ Relationship between antecedents of organizational design dimensions of full-fledged PBOs and Experience of the respondents' organizations

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Project orientation	Between Groups	.498	3	.166	.309	.819
	Within Groups	94.472	176	.537		
	Total	94.970	179			
Project working	Between Groups	.214	3	.071	.148	.931
	Within Groups	85.095	176	.483		
	Total	85.309	179			
Fit	Between Groups	2.603	3	.868	1.292	.279
	Within Groups	118.209	176	.672		
	Total	120.812	179			
Project culture	Between Groups	.924	3	.308	.631	.596
	Within Groups	85.985	176	.489		
	Total	86.909	179			
Churn	Between Groups	2.089	3	.696	1.694	.170
	Within Groups	72.362	176	.411		
	Total	74.451	179			
History and context of the organization	Between Groups	1.685	3	.562	1.744	.160
	Within Groups	56.675	176	.322		
	Total	58.360	179			
Size	Between Groups	.192	3	.064	.133	.940
	Within Groups	84.732	176	.481		
	Total	84.923	179			
A shareholder versus stakeholder orientation	Between Groups	.364	3	.121	.252	.860
	Within Groups	84.658	176	.481		
	Total	85.022	179			
Control by behaviours or results	Between Groups	2.886	3	.962	2.020	.113
	Within Groups	83.816	176	.476		
	Total	86.701	179			
Uncertainty, dynamism and complexity	Between Groups	.888	3	.296	.799	.496
	Within Groups	65.193	176	.370		
	Total	66.081	179			
Awareness and knowledge of project management	Between Groups	.288	3	.096	.167	.918
	Within Groups	100.784	176	.573		
	Total	101.072	179			
Project core team	Between Groups	1.215	3	.405	.579	.630
	Within Groups	123.096	176	.699		
	Total	124.311	179			
Strategic project management information system	Between Groups	.556	3	.185	.698	.555
	Within Groups	46.727	176	.265		
	Total	47.282	179			
Dynamic capability and organizational learning	Between Groups	1.146	3	.382	.897	.444
	Within Groups	75.006	176	.426		
	Total	76.153	179			
Upper management support	Between Groups	.698	3	.233	.323	.809
	Within Groups	126.612	176	.719		
	Total	127.309	179			
Competency of project managers	Between Groups	1.162	3	.387	.742	.528
	Within Groups	91.886	176	.522		
	Total	93.048	179			

APPENDIX VII: ProMAC 2021 CONFERENCE PRESENTATION CERTIFICATE

Certificate

The Organizing Committee of ProMAC 2021 certifies that the paper mentioned below has been selected by full paper-review by two anonymous reviewers and published in the proceedings and it has been presented by the authors at ProMAC 2021 in Kumamoto, Japan, 25-26 Nov. 2021.

Transforming Ethiopian Construction Firms into Competitive Project Based Organizations: a Literature Review & Reflection for Future Research

Henok Asfaw Hailu

M. D. Pantaleo Rwelamila

Chair, Program Committee of ProMAC 2021

Tetsuro Seki, Dr. & Prof.

Organizer

The Society of Project Management

APPENDIX VIII: LANGUAGE EDITING CERTIFICATE

Dr Marthie de Kock
Academic Consultant and Editor
DLitt et Phil

Mr Henok Asfaw Hailu
Graduate School of Business Leadership
UNISA, SA

20 November 2022

Dear Mr Hailu

This letter is to confirm that I have language edited your DBA thesis:

A Conceptual Model for Transforming Ethiopian Construction Firms

into Full-fledged Project-based Organisations

Language confirmed: UK English (except Appendices)
General checks: Spelling, grammar, and sentence structure.
Punctuation: Including consistent use of ellipses, hyphens, and quotation marks.
Numbering: Headings, sub-headings, and pages.
Passive voice: Acceptable in academic writing.
No reformatting was done.
Citations in Text must be checked against Reference list.

The utmost care has been taken to identify errors in the document with a high level of attention to detail. However, it is inconceivable that errors will be missed due to human error. If any rules have been applied that you are unhappy with, if you have any questions, or if you require any changes, please let me know.

I wish you the best with the examination and confirmation of your research thesis.

Kind regards

MdeKock

Marthie de Kock (DLitt et Phil)

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APPENDIX IX: TURNITIN REPORT

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