Investigating the relationship between top management teams' characteristics and organisational innovation: The mediating role of dynamic capabilities

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By

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Dedication

To my parents, siblings and my friends for being true friends.

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Praise be to Almighty Allah who has blessed me and chose a right path for me to complete this doctoral research.

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Declaration

I hereby declare that the materials contained in this thesis have not been previously submitted for a degree in this or any other university. I further declare that this thesis is solely based on my own research. I declare that all information in this research has been obtained and presented in accordance with academic rules and ethical conduct.

Bader Aldawaish

Abstract

Despite the considerable role of TMT characteristics, a limited amount of interest has been paid to address the impact of top management teams' characteristics on the organizational innovation. Further, as organizational innovation is the main responsibility of lower- and middle-level managers, there is a possibility to have a number of factors (i.e. dynamic capabilities) that could mediate the relationship between TMT characteristics and organizational innovation. Nevertheless, there is an absence of studies that have empirically tested the role of mediators on such relationship. Moreover, in the Saudi Arabia, the related issues of TMT characteristics, DCs, and organizational innovation have not been well covered. Thus, the focus of this research is to empirically examine relationship between TMT characteristics and organizational performance by considering the mediating role of DCs within the context of small- and medium-sized construction organisations in Saudi Arabia.

A mixed method research design was adopted using both techniques: questionnaire survey and interviews. About 250 self-administered were collected using snowball sampling techniques to SME managers-owners of small construction firms in Saudi Arabia. Structured interviews, unstructured, open-ended discussion were also conducted to collect the qualitative data from 20 SME managers-owners in Saudi Arabia. The data collected by questionnaire were then tested using Structural equation model by facilitating AMOS software. According to statistical results, DCs were approved to have a significant mediating effect in the relationship between in the relationship between Educational Level, Tenure Diversity / Heterogeneity, Functional Experience and Organizational Innovation on the one hand, and performance on the other. These results are consistent with the results of the thirteenth question in the qualitative research which confirmed that the availability of Dynamic Capabilities gives organizations an advantage and enables them to achieve Organizational Innovation and improve performance.

This study will hopefully provide both practitioners and academics with more understanding about the aspects that shape the relationship between TMTs characteristics, DCs and innovation. This, in turn, will help managers to have the best managerial practices enhancing the current situation of innovation and performance in small- and medium-sized construction companies in Saudi Arabia. As the current study only focused on the construction firms in Saudi Arabia, other sectors and countries could be considered by future studies to see the

applicability of the current model on a larger scale. Further, future studies could consider other factors that could predict the organizational innovation as well as going further to discover the main consequences of the organizational innovation.

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1 Introduction and Background

1.1 Overview of the Chapter

The level of competition within the business environment has increased over the years and this has forced organisations to improve their innovativeness to stay in business. In this regard, top management is seen as a very important element in ensuring innovativeness and competitive advantage is created due to its impact on the company vision. This chapter presents the background of the research area which covers top management team (TMT) characteristics and organisational innovation. The chapter is divided into seven main sections: it first presents the background to the research and sets the basis for conducting this research; this is followed by the research problem to be solved; the third section presents the aim and objectives of the research followed by the key research questions; the fifth section discusses the significance of the research; and sections six and seven present an overview of the methodology adopted and an overview of the general research contributions to knowledge respectively. This chapter concludes with an overview of the structure of the thesis.

1.2 Theoretical Background

It is not possible to overstate the necessity for innovation in product and service delivery. As stated by Elenkov et al. (2005), innovation is crucial to ensure organisations stay competitive (Elenkov et al., 2005). Talke et al. (2011) state that innovation is of strategic significance for every organisation. In many organisations, responsibility for innovation is reserved for members of the TMT. Proponents of Upper Echelons Theory agree with this view. Talke et al. (2011) also argue that TMTs are best-placed to understand the strategic vision of their organisations as they are responsible for apportioning resources for the tasks of "conceptualising, implementing and evaluating" the innovative options that are open to their organisation as a whole.

TMTs have been the focus of much scholarly attention due to how crucial their influence can be over an organisation's performance (Eisenhardt, 2013). Alexiev et al. (2010) argue that the role of TMTs must also include collaborating with other members in the organisation to pool the required knowledge to improve the organisation. To achieve this, the process adopted by

TMTs should include vision formation with an emphasis on the future development of the organisation; communication of the vision to their subordinates; motivating the subordinates to support the vision; and engaging in strategic exchanges with the subordinates to support the vision. This means that the influence of the TMT is felt across the whole of the organisation, with all those that are part of the organisation being directed and encouraged to work towards achieving the group vision.

Tulung and Ramdani (2016) argue that the part that TMTs play and their importance for the overall success of the organisation needs those in the TMT to demonstrate specific characteristics. These should include ones that improve the organisation's performance, namely innovative solutions to problems, and novel ideas to increase performance and reach. Such characteristics have received a great deal of scholarly attention in relation to TMTs and organisational performance. The usual characteristics that are pinpointed are: "level of education, functional knowledge, tenure diversity and heterogeneity, age, technological related degrees, and industrial and international experience" (Alexiev et al., 2010; Nadolska et al., 2014; Heyden et al., 2015; Chen et al., 2018; Lin and Li, 2018; Kaplan and Sorensen, 2017). However, possessing such characteristics is not a guarantee of organisational success through improved performance. They also need to be put to good use to this end. This is where the importance of having a strategic vision comes to the fore. Another catalyst for success is one pointed out by Alexiev et al. (2010) who emphasise the importance of taking advice from both internal staff and external stakeholders. Based on this idea, the researcher states that what can be termed a dynamic capability (DC) plays a crucial role in enabling a TMT to innovate and improve performance. As well as the characteristics noted above, TMTs should have the ability to sense, seize and reconfigure opportunities. These are the three basic domains of DCs originally set out by Teece (2007).

Although what constitutes innovation is currently broadly accepted, its full extent is debated. One of the major perspectives is the Schumpeterian one. Early on, Schumpeter (1942) made the claim that innovation is destructive and involves creating something entirely new from a pre-existing product. There are other views on innovation. For example, Damanour (1996) argued that adapting an idea or behaviour of a product or service can be seen as innovation. O'Sullivan et al. (2008) consider innovation from a product/process perspective as making improvements to physical products and the methods of making those products. In contrast,

Jansen et al. (2006) suggest that innovation follows from taking an exploratory approach, either by building on new knowledge or diverging from established ways of doing things.
If all these perspectives are combined, innovation can therefore be said to be found in all parts of the business of the organisation: product, process, service and technological innovation. Damanpour et al. (2001) also state that adopting innovation is a way for an organisation to improve its effectiveness or maintain its position through adapting to a change in its environment to maintain competitiveness. The above discussion indicates that the Schumpeterian perspective that a destructive approach is required to produce profound changes is outdated and in fact innovation should not be destructive. All this notwithstanding, the deciding factor is whether such innovation satisfies client demands.

The overriding mission of innovation is improving the provision of goods and services by the improvement of the process and the products themselves as well as any attributes they might have for the overall improvement of performance of the organisation. The link between TMT characteristics, DCs, organisational innovation and firm performance is therefore the main focus of this research.

1.3 Research Problem Statement

The Kingdom of Saudi Arabia is witnessing a remarkable development in all economic and strategic sectors, especially those concerned with infrastructure and superstructure. One of the most important and promising sectors is the contraction one. The important of this sector could be returned to the large amount of human and financial resources invested in as well as to the value and contribution that construction sector could add to the other sectors in the Saudi Arabia. A part of construction sector is small- and medium-sized construction organisations which have been established with a high level of ambitions and aspirations. Additionally, the small- and medium-sized construction organisations have been early supported by the Saudi government as part of a comprehensive development plan to support local investment and domestic organizations.
However, there is a lot of challenges and critical problems that that this type of these organizations cope with in Saudi Arabia. This is in addition to the fact that there is a big concern regarding the performance of these organizations; for instance, about 70% of SMEs construction organizations in the Saudi Arabia face the risk of discontinuing their bids from

government projects (Alriyadh, 2007). According to more recent report published in 2017 by Asharq Al-Awsat, more than 40% of construction companies in Saudi Arabia suffer from tripping which has been reflected on their ability to support their employees and paying their Salaries. In details, the same report stressed that the rate of stumbling projects due to the dispute on the quality and technical specifications was estimated at about 70% (Asharq Al-Awsat, 2017). More importantly, it is estimated that the small enterprises 'default rate due to financial crises, lack of disbursement of the rights of workers and suppliers, lack of scheduling of abstracts, and banks' lack of cooperation in financing are estimated at 90% (Asharq Al-Awsat, 2017).

According to the above-mentioned discussion, there is a critical necessity the scientifically examine this sector and empirically identity the main factors predicting the performance of the small- and medium-sized construction organisations and their ability to get survive. In this regard, Alkhoraif and McLaughli (2018) argued that one of the big challenges that impact the performance of the small- and medium-sized firms in Saudi Arabia is related to the organizational culture and the people and top management team characteristics (i.e. mind-set, style of thinking). Alkhoraif and McLaughli (2018) also argued the role of innovation management to sustain the performance of SMEs in the KSA.

In the light of the current situation of construction sector in the KSA, there is an important to discover the main capabilities that the small- and medium-sized construction firms really need to capture their competitive advantage, and accordingly, reach the targeted level of their performance. In this regard, Teece et al. (1997, p. 516) assured that idea that "the firm's ability to integrate, build and reconfigure internal and external competences to address rapidly changing environments". This, in turn, clearly approves the crucial role of dynamic capabilities in the small- and medium-sized construction firms in Saudi Arabia to get out of their difficult situation. Such impact of DCs could also be returned to fact that DCs have positive role in enriching the ability of organizations to be more innovative and creative in their business solutions (see Teece, 2007). In fact, different aspects and functions of the organizational performance (i.e. product development, profitability, intellectual properties, and organizational learning) are closely related to DCs level existing in the organization (Lawson & Samson, 2001). Accordingly, this study found out that it is important to consider and discover the role of DCs on the organizational innovation and performance. As well as, this study would like to look at the main factors that could predict and impact the role of DCs.

Over the last 50 years, there have been many perspectives on the issue of leadership and the extent of the influence of leaders on performance (Smircich et al., 1982). One view is that leadership is inherent and innate (Clark et al., 1992). Another is that leadership can be learnt through training and education. Both these perspectives see leadership as synonymous with individual leadership – that such people can be transformative for an organisation (Gilley et al., 2008). However, there is a different perspective that views leadership as emanating from TMTs and not just individual members (Fiedler and Gracia, 1987).

Hambrick and Mason (1984) were the first to shift the debate on leadership away from individuals and towards a group, and others then followed (Menz, 2012; Higgs, 2009; Hsu et al., 2008; Pitcher and Smith, 2001; Thomas and Ramaswamy, 1996; Pettigrew, 1992; Hambrick and D'aveni, 1992). Upper Echelons Theory (Hambrick and Mason, 1984) changed the theoretical discussion by claiming that an organisation is a reflection of the characteristics of its top managers as it is they that take strategic decisions that affect organisational outcomes.

Hambrick and Mason's theory has received a variety of scholarly attention. Menz (2012) claims that the insights from TMT research have not been compelling because the fields of study have been limited to the areas of information systems, accounting, management and strategic management. This has therefore restricted our understanding of the variables and their relationships. Another criticism has been about the lack of fieldwork that would further explain TMT characteristics so that many research issues have been left neglected and unresolved (Menz, 2012; Higgs and Dulewicz, 1997; Kilduff et al., 2000; Higgs, 2006).

Not only has the literature on TMT and its effect on organisational innovation been unable to effectively predict the influence of TMT characteristics on organisational innovation (Hsu et al., 2008) but it has also not moved forward on identifying the factors that explain the effect of top managers on organisational innovation (Talke et al., 2011). In addition, the scarcity of conceptual and methodological contributions has resulted in weak theoretical development of the link between top managers and organisational innovation (Armbruster et al., 2008; Hsu et al., 2008; Scott and Bruce, 1994). This is despite the importance of the impact of TMT characteristics on organisational innovation (Menz, 2012; Finkelstein et al., 2009; Hambrick, 2007).

The direct influence of top managers on organisational innovation is rare as their involvement is considered to be 'micromanagement'. It is in fact lower- and middle-level managers that most undertake organisational innovation (Hsu et al., 2008). However, there is some indirect influence of organisational innovation. Elenkov and Manev urge more scholarly work be undertaken to investigate the factors that mediate the relationship (2005). This absence has limited our understanding of the significant role that these mediators play in explaining the link between top managers and organisational innovation (Hsu et al., 2008).

A mediator variable is crucial to create a balance in the relationship between top managers and organisational innovation. Penrose and Pitelis (2009) state that combining an organisation's resources would bring added value to organisational innovation. A capability-based perspective of an organisation was developed for this purpose (Teece, 2001), with a particular capability gaining the attention of researchers in strategic management, namely DCs (Winter, 2003; Teece, 1997, 2007). The idea behind this, as explained by Barreto (2010), is that an organisation with higher levels of DC has a correspondingly higher level of innovation. Despite the recognition of the importance of DCs as a mediator, a clear gap in knowledge exists in relation to organisational level (Dyer and Hatch, 2006). Moreover, DC literature remains disconnected, with research findings pointing in different directions (Barreto, 2010; Ambrosini et al., 2009); significantly more attention should also be given to the underpinning managerial theoretical.

In addition, the literature review found no study that links TMT characteristics, DCs and organisational innovation. For the few studies relating to this research, they were not relevant to the construction industry nor Saudi Arabia which it is argued has different characteristics from other countries. Based on the above discussion, it can be concluded that there is a lack of research on the link between TMT characteristics and organisational innovation. The focus of this research seeks to remedy this by identifying DCs as a mediator between these and therefore an influence on performance.

Given the gaps identified in the literature, a theoretical framework that investigates the mediating effect of dynamic capabilities on the relationship between top management teams characteristics, organisational innovation and performance is missing in the literature. This represents a problem that needs to be resolved. It is a problem because there is a certain interaction among the constructs that we know little about the outcome. Solving such problem will require significant amount of data collected and analysis to explore these outcomes and make recommendations. This is therefore the problem that this research seeks to address. Moreover, the above suggest the direct relationships within the construct are far from linear in the real world. This is because, there are other factors that combine to bring added value to performance. As suggested by Pitelis (2009), combining an organisation's resources would bring added value to organisational innovation. As a result, Teece (2001) developed the capability based perspective. This research therefore argues that adopting dynamic capability as a mediator could influence the effects of the independent variables on the dependent.

1.4 Research Aims and Objectives

The main aim of the research is to review literature on top management teams, dynamic capabilities, upper echelon, organisational innovation, firm performance to develop and test a conceptual framework that explore how dynamic capability mediate the relationship between top management teams characteristics, organisational innovation and performance in the private sector of the Saudi Arabian construction industry. This will help to shed more light on how TMT characteristics, dynamic capabilities and organisational innovation effect performance. Given this context, this research aims to:

1. To investigate the mediating effect of dynamic capabilities on the relationship between TMT characteristics, organisational innovation and performance; and
2. Provide practical guidance for implementation of the strategic framework to academia and the private industry.

To achieve the overall aims of the research, six specific objectives have been outlined:

Objective 1: Critically review the literature review in the field of TMT characteristics, dynamic capabilities, organisational innovation and performance.

Objective 2: Determine the construct validity of the proposed a framework, its potential benefits and limitations.

Objective 3: Examine the effect of TMT characteristics on performance, organisational innovation and dynamic capabilities.

Objective 4: Examine the effect of dynamic capabilities on performance and organisational innovation.

Objective 5: Explore the effect of organisational innovation on performance.

Objective 6: Examine the mediating effect of dynamic capabilities on the relationship between TMT characteristics, organisational innovation and performance.

1.5 Research Questions

In order to purse the objectives of the research, one important question need to be answered; How can the mediating effect of dynamic capability on the relationship between top management teams characteristics, organisational innovation and performance be best understood?" Answering this question enables us to uncover the direct and indirect effects of the constricts on the conceptual framework.

1.6 Significance of the Research

The current research seeks to investigate the mediating role played by the dynamic capabilities in the relationship between TMT characteristics and organisational innovation. This gives the research both academic and practical interest due to the importance of the need for innovation in construction organisations especially in Saudi Arabia. The need to understand the relationship between innovativeness of organisations and the characteristics of the TMT in charge of managing such organisations as well as the role played by dynamic capabilities will play a key role in ensuring improvements in construction organisations. The following importance of the likely outcomes of this research serve as justification for undertaking the research:

1. For the construction industry, this research has the potential to set the starting point for the development of theory in relation to TMT characteristics and organisational performance.
2. The research will also provide a systematic basis for developing a highly reliable measure for TMT characteristics, dynamic capabilities and organisational innovation.
3. The research seeks to highlight the importance of TMT characteristics, dynamic capabilities

and organisational innovation for the benefit of future strategies that organisations formulate and use to support their performance.

1.7 Research Contribution to Knowledge

The current research empirical analysis contributes to knowledge in many areas. First, the current work introduces TMT Characteristics (Average Age of TMT Members, Educational Level, Tenure Diversity / Heterogeneity and Functional Experience) which are key variables in this research.

The research delivers a theoretical understanding of how perceptions of the research variables such as TMT characteristics (Average Age of TMT Members, Educational Level, Tenure Diversity / Heterogeneity and Functional Experience) are considered important variables in improving performance in the context of the Kingdom of Saudi Arabia (construction sector).

Finally, this research adds knowledge in the area of dynamic capabilities and organisational innovation within developing culture, specifically in the Kingdom of Saudi Arabia (construction sector). Beside the academic contribution of this model, this study also presents practical contributions. The Researcher believes that there are many benefits that can be derived by revealing the findings in this research.

Practically, this research provides decision-makers and practitioners in the Kingdom of Saudi Arabia (construction sector), with information to assess the usage of TMT Characteristics from multiple perspectives. The results also could help in the development of organisational innovation procedures and strategies in organisations in the Kingdom of Saudi Arabia (construction sector). All this would improve the management process to provide better services to customers.

1.8 Overview of the Research Method Adopted

A mixed method research design was adopted that consist of questionnaires and interviews. The questionnaires where developed using 5 point likert scale from strongly agree to strongly disagree and was piloted to ensure there was no vagueness in the questions and to make sure

that the respondents understand the questions clearly. The questionnaires were self-administered and collected using snowball sampling techniques to SME managers-owners of small construction firms in Saudi Arabia. AMOS software was used to analyse the data while performing a series of test to determine reliability and validity of constructs. Also, confirmatory factor analysis was used to determine the factor loadings and explore other fit indices. Structural equation model was then used to identify path coefficients of the conceptual framework.

Qualitative analysis was conducted through interviews. The aim of the questions was to explain the results from the quantitative analysis and gain an in-depth understanding of the proposed model. Four main themes were developed, namely: TMT characteristics theme, organisational innovation theme, dynamic capability theme and performance theme based on the proposed research framework from the first phase, the quantitative analysis. However, this research adopted mixed methods, as illustrated in Table 1.1.

Desk Research	Field Research
▪ To perform critical evaluation of the academic TMT characteristics, organisational innovation and dynamic capability literature	▪ To collect and analyse the data collected through quantitative or qualitative means
▪ To define and discuss TMT characteristics, organisational innovation and dynamic capability literature gap	▪ To validate the role of organisational innovation and dynamic capability, in ensuring improved performance as well as the benefits and limitations of the variables
▪ To develop a framework for theoretical TMT characteristics, organisational innovation and dynamic capability that addresses the literature gap	▪ To provide practical guidelines for the TMT characteristics, organisational innovation and dynamic capability in relation to academic work and industry at Saudi Arabian

Table 1-1 Research Methodology
Source: Researcher

As shown in Table 1.1 above, the research has two main areas of focus: desk research; and field research. During the desk research stage, emphasis was placed on critical review of published work from journal articles, books and professional accounts to establish the theoretical basis for identifying TMT characteristics, organisational innovation, performance and dynamic capability. The second phase of the research involved the collection of empirical data through qualitative and quantitative data (Walonick, 1993).

1.9 Thesis Structure

The content of chapters of the thesis is illustrated in the following section below:
Chapter 1's purpose is to introduce the TMT characteristics, dynamic capabilities organisational innovation and performance. It presents the research motivation and problem as well as research questions, aims and objectives.

In Chapter 2, a brief history of TMT characteristics, dynamic capabilities, organisational innovation and performance is presented. It explores the concepts, and their development in particular from previous studies. The literature provides in-depth research on TMT characteristics and how they affect organisational innovation and performance through dynamic capabilities.

In Chapter 3, the principle theories are highlighted; these theories were merged to develop a conceptual framework, and this was proposed based on the propositions to address the research questions from the acknowledged gaps in the existing literature

Chapter 4 relates to the data theory, where the focus is on testing and validating the theoretical and proposed conceptual framework presented in Chapter 3. The research philosophy, design and methodology of the research project are explained in this chapter. Regarding the research philosophy, this chapter presents a discussion of an interpretive paradigm, which underpins this research. The research design is presented; this includes the research framework. There is an explanation of the specific methodologies adopted in this research with justification. This chapter also offers descriptions of the data analysis process; additional associated topics presented in this chapter are research reliability and validity, ethical considerations and lastly research limitations.

In Chapter 5, the use of structural equation modelling as the basis for data analysis for this research is presented. This chapter checks the key requirements of using the model and performs confirmatory analysis for all the variables in the instrument.

Chapter 6 presents the analysis of data collected from the quantitative phase of the research which helps in validating the conceptual framework developed in Chapter 3. This chapter alsopresents the analysis of data collected from the qualitative phase of the research through the use of interviews. This chapter seeks to corroborate the results from the quantitative phase by providing more in-depth analysis and views of participants on the link between TMT characteristics, dynamic capabilities and organisational innovation.

Chapter 7 presents a discussion of the findings from both the qualitative and quantitative phases of the research by comparing the outcomes to the literature on TMT, dynamic capabilities and organisational innovation and performance. This chapter also presents the implications of the research for construction organisations.

The final chapter, Chapter 8 presents an overview of the research and demonstrates how the aims, objectives and research questions have been answered or achieved. The chapter also presents the general conclusions of the research and makes recommendations for industry and for further studies. Figure 1.1 diagrammatically highlights the overall research thesis structure.

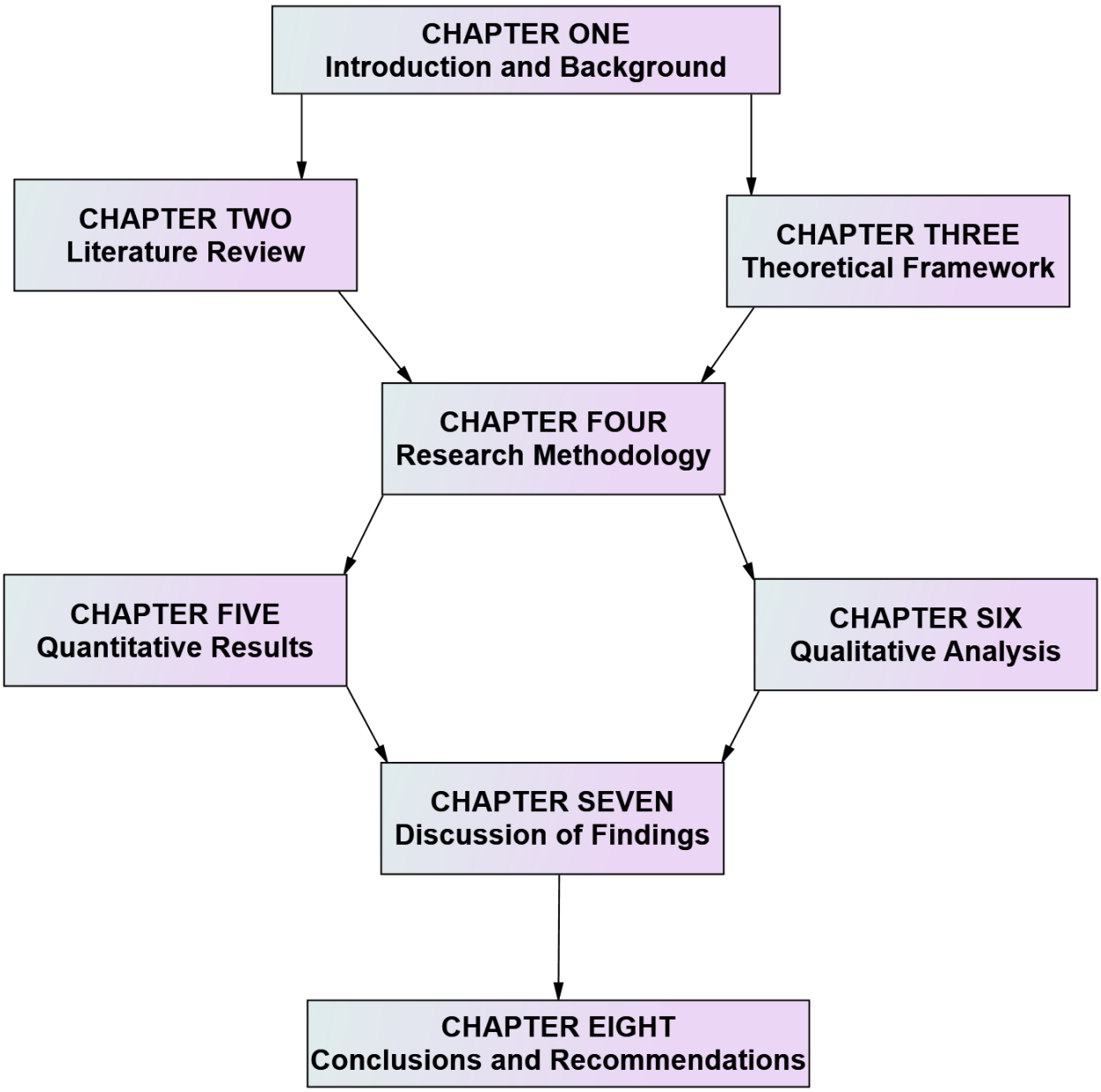

Figure 1-1 Thesis Structure

1.10 Chapter Conclusion

This chapter has provided an overview of the research by presenting the background to the subject under research and indicating the main research questions that need answering. The chapter has also discussed the main aim and objective of this research and has provided an overview of the outline of this thesis. As seen from the chapter, the need to investigate the relationship between TMT characteristics, dynamic capabilities, organisational innovation and performance cannot be over emphasised. Based on this background, the next chapter

presents a critical review of the existing literature on the subject to ensure that a better understanding of the prevailing views are captured.

2 Literature Review

2.1 Overview of the Chapter

With the background to the research being presented in Chapter 1, this chapter discusses the literature on TMTs, organisational innovation and performance, and the role of dynamic capabilities. To begin with, the significance and definitions of TMT are considered, followed by linking performance as an outcome of the characteristics of TMTs and organisational innovation.

2.2 Top Management Teams

Due to the increased attention in TMTs, there is a substantial amount of research on them, such as by Carpenter et al. (2004), Ou et al. (2017), Gracia-Granero et al. (2017) and Patock et al. (2018). There has been an especially significant input in relation to Upper Echelons Theory. This Upper Echelons approach, first described by Hambrick and Mason (1984), offered TMT research a "fresh lead" (Pettigrew, 1992, p. 164) and in fact can be treated as "a central catalyst" (Carpenter et al., 2004: 750) for TMT research. This brought about a change in the direction in organisational leadership literature. Where traditionally it had focused on the individual leader, it shifted to the TMT; and where it placed the power over the decision-making and output in the environment setting, it now took into account the characteristics of the leaders as well (Menz, 2012; Higgs, 2009; Pitcher and Smith, 2001; Thomas and Ramaswamy, 1996; Pettigrew, 1992). Pettigrew (1992) went as far as to say that the managerial elite's research is one of the most important, albeit difficult, new research areas.

In spite of the large quantity of research created in the area of TMTs and Upper Echelons Theory, Menz (2012) believes there are still lacunae and queries that would benefit from more research (Menz, 2012). The large amount of research is partly the result of the many different disciplines that have given it attention. The following paragraphs of the literature review adopt a critical perspective of the TMT concept and refer back to the research questions in the previous chapter. Definitions of TMT are first given and it is then clarified who can be considered TMT members, the acts that are associated with TMTs, and how these can be linked to the results of those acts, i.e. in relation to organisational outcome.

2.2.1 Concept of Top Management Teams

Given the dual role of Upper Echelons Theory as a theoretical framework and a research methodology, the definition of TMT is of central importance. As stated earlier, the literature gives many definitions of TMT. These should be considered to gain a deeper understanding which will aid in creating a precise and manageable working definition for this thesis.

The definition of TMT usually relates to its purpose and the discipline to which it is applied. Carpenter and Fredrickson (2001, p. 538) categorise only the top two management tiers as TMTs, stating that this includes the "CEO, chairman, chief operating officer (COO), chief financial officer (CFO), and the next highest management tier of a firm". Kor (2003) defines TMT, based on the concept of TMT competence and the impact this has on the capacity of the organisation, as "all inside top-level executives, including CEO, COO, business unit heads, and vice presidents".

On reviewing TMT theory literature, (Carpenter et al.2004, p. 753) explain that "the top team construct and team membership are often identified using the measurement heuristic of senior hierarchical level, as indicated by title or position, since individuals at higher levels are expected to have greater influence on strategic decisions". By following this logic, these authors suggest that CEOs can be considered key informants in the process of identifying team members who are likely to be part of strategic decisions.

TMT members for Menz (2012) are senior executives in the TMT who are in charge of one or more functional areas in their organisations.

Based on the above definitions, a working definition for TMT for this thesis is: "All inside top-level executives, including CEO, COO, business unit heads, vice presidents, chairpersons, general managers, vice general managers, vice presidents, chief accountants/chief financial officers, and other top-two tiers of executives". The hope is that this definition is comprehensive and detailed in that it includes all TMT managers in an organisation.

2.2.2 Characteristics of Top Management Teams

Table 2.1 below synthesises the different TMT characteristics mentioned in the literature on which there is some degree of agreement. The studies cited were chosen as they are the most appropriate and are line with the current research variables. Moreover, they are the latest studies in this area and are published in global journals.

No	Author/s	Year	Top Management Team Characteristics												Total
			Tenure diversity	Size	Gender diversity	Age diversity	Education level	Educational background diversity	Heterogeneity	More degrees	Team tenure	Functional diversity	international experience	previous experience	
1	Carpenter et al.	2004				×	×					×			3
2	Simsek et al.	2005	×	×		×	×					×			5
3	Herrmann & Datta	2005	×			×	×					×	×		5
4	Cho & Hambrick	2006	×						×						2
5	Carmen et al.	2006										×			1
6	Goll et al.	2007	×			×	×		×			×			5
7	Camelo et al.	2010	×				×					×			3
8	Chen et al.	2010	×			×	×					×			4
9	Buy et al.	2011										×		×	2
10	Liu et al.	2014	×	×	×	×				×	×				6
11	Yang & Wang	2014			×	×		×				×			4
12	Colombelli	2014				×	×							×	3
13	Bany-Ariffin et al.	2014				×	×					×	×		4
14	Doms & Aufseß	2014				×	×					×	×	×	5
15	Díaz-Fernández et al.	2015	×			×	×				×				4
16	Colombelli	2015				×	×							×	3
17	Tulung & Ramdani	2016			×	×	×	×							4
18	Sperber & Linder	2016	×			×	×					×			4
19	Yoon et al.	2016	×	×		×		×				×			5
20	Lee et al.	2017	×				×							×	3
Total			11	3	3	15	14	3	2	1	2	13	1	2	
Ratio of total author/s			55%	15%	15%	75%	70%	15%	10%	5%	10%	65%	5%	20%	
Rank			4	6	6	1	2	6	7	8	7	3	8	5	
Characteristics held by 50% or more			✓			✓	✓					✓			

Table 2-1 TMT Characteristics from a Relevant Sample of Researchers

Source: The Researcher

The following conclusions can be drawn from the table above:

1. The total number of studies in this area has increased over the years. For example, out of the 20 pieces of research reviewed, 14 were conducted after 2010 compared to 6 before 2010.
2. The number of measurement indicators varied between a maximum of 6 indicators as in Liu et al. (2014) and a minimum of 1 indicator as in Carmen et al. (2006).
3. Four indicators attracted higher than 50% of the total measurement indicators (Idris, 2014).

Based on the above table, this thesis identifies the following TMT characteristics as relevant to this research: age diversity, educational level, tenure diversity and functional experience. The next section reviews literature on each of the characteristics and their impact on performance.

2.2.2.1 Age Diversity Characteristic

A demographic variable that is particularly important in relation to TMT characteristics is age as it is an indicator of an individual's experiences. The reasoning goes that in general individuals of a similar age range share common experiences, which in turn means shared attitudes and beliefs (Yang and Wang, 2014). It is also expected that with differences in ages come differences in opinions on strategic issues that organisations face. This can influence the need for change and, as a corollary, the potential for organisational innovation. As such, the age of an individual can be said to influence viewpoints on strategic decision-making and choices (Knockaert et al., 2011).

Moreover, the differences in member ages may result in different experiences regarding economic, social and political settings and events. These inevitably lead to the formation of varying attitudes, values and visions which have a substantial impact on strategy and innovation. He and Liu (2010) claim that heterogeneous attitudes and values can foster team creativity, which is particularly helpful for overcoming difficult situations. Teams with members of different ages can therefore be said to be more innovative (He and Liu, 2010). Sessa and Jackson state that age has an impact on social relations (1995) to the point that team members of different ages are able to form broader ones. Since such a difference

increases the number of views on strategic issues, the enterprises they belong to will be better placed to pursue innovations in the future.

2.2.2.2 Educational Level Characteristic

Upper Echelons Theory posits that the characteristic of formal educational background reflects the abilities and skills of managers (Hambrick and Mason, 1984; Hambrick et al., 2005). Research by Hitt and Tyler (1991) and Koon et al. (2012) in this area indicates that an elite education has a particularly strong effect. In other words, educational background has an impact on strategic decision-making abilities and outcomes. For their part, Goll et al. (2008) state that there is a positive relationship between educational levels. In dynamic and uncertain settings, having varying educational background levels within the TMT will have a positive impact and widen the strategic boundaries of the organisations into new business opportunities (Liu et al., 2014). For complex issues, such as organisational innovation, it is believed that a TMT with executives from a broad educational base can better deal with a broader range of issues. This is because of the different types of knowledge they have.

2.2.2.3 Tenure Diversity Characteristic

Tenure means the common historical experience of the TMT members (Barkema and Shvyrkov, 2007). Possessing this is likely to help the TMT members to pinpoint the distributed functional knowledge within the TMT. The literature employs the term "transactive memory" to describe the convergence of the knowledge held by each member and a collective understanding of the individual members that hold it (Brandon and Hollingshead, 2004). Having a shared experience will allow TMT members to identify and employ the relevant knowledge more effectively. It can be reasoned that the longer the shared experience, the better they understand the place where the distributed knowledge is located (Austin, 2003), as well as the longer they have all had to decide on the trustworthiness and expertise of the advisers within the group of TMT members (Arendt et al., 2005). Following this, it can be stated that shared experience gives TMT members the ability to build up mutual understanding and find similarities within differences. Because of this, given that TMT members have such in-depth knowledge of each other, Simsek et al. (2005) argue that they should also possess the ability to improve the quality and quantity of TMT information sharing (Simsek et al., 2005). Another significant aspect is that shared experience will

increase the degree of familiarity between the TMT members, as well as increasing the familiarity of TMT members with TMT communication processes (Kor, 2003). Shared experience has the added advantage of creating time for interpersonal trust and psychological safety to build inside the TMT. According to Edmondson et al. (2003), these are major means of sharing specialist information. Organisational innovation might be restricted if such experiences are low.

2.2.2.4 Functional Experience Characteristic

In addition to the three characteristics above, research on the ground shows that patterns of associations between functional backgrounds, business-level strategies and organisational innovation exist (Peyrefitte et al., 2002). In their study, Miles and Snow (1978) proposed that the main groups of efficiency-orientated "defender" organisations would be mainly made up of managers with throughput-orientated backgrounds, for example, those in finance and production, while marketing-seeking "prospectors" would be headed by individuals with output-orientated skills, for example, those in marketing and product development, with skills needed to expand markets and bring innovation into organisations. Previous studies indicate that differences in functional background or functional experiences are associated in a positive way with adaptation and change (Bluedorn et al., 1994). Possessing different functional backgrounds has the potential to bring together TMT technical, legal and management skills, as well as new ways of thinking and indeed new information (Carpenter and Fredrickson, 2001). This also prevents short-sighted thinking, promotes innovative problem-solving, and helps to overcome unusual and complex problems (Jehn et al., 1999; Mayer, 2012), which all lead to greater innovation. Taking all this into account, the TMT can be viewed as a means of information-processing (Harrison and Klein, 2007). Differences in TMT functional experiences can increase the richness of information and perspectives, thus prompting more positive entrepreneurial efforts. Moreover, according to contingency theory (Knockaert et al., 2011), although homogeneous teams are better able to overcome simple everyday problems, heterogeneous teams are better able to overcome unconventional new problems, which surely stands them in better stead when faced with the complexities of entrepreneurial activities. For this reason, this research expects to conclude that TMTs are stronger when they possess a wide variety of functional expertise.

2.3 Dynamic Capabilities

The theory of dynamic capabilities (DC) has been employed in order to understand the competitive advantage of organisations (Tondolo and Bitencourt, 2014). DC has drawn the attention of scholars working in the field of organisational strategy, especially in terms of the development of resources and capabilities (Ambrosini and Bowman, 2009; Biazzi, 2012). However, there has also been criticism of DCs, mainly due to issues over terminology (Zahra et al., 2006); tautology (Zollo and Winter, 2002) and research methods (Delbridge et al., 2006). Therefore, an increase in the study of DCs has also brought with it an effort to develop the theory, as well as the review of a number of its concepts in relation to the practice of organisations (Wang and Ahmed, 2007).

Given that no general consensus on the nature and properties of DCs has emerged yet, the Researcher will provide a comprehensive overview of its evolution in terms of the concept itself and its dimensions.

2.3.1 Evolution of Dynamic Capabilities

Change has been central to the theoretical and empirical examination of DCs. Generally, it has been thought that DCs are employed to bring about a change in positions (Teece et al., 1997), resource configurations (Eisenhardt and Martin, 2000) or zero-level/operating capabilities (Winter, 2003). However, Winter (2003) states that there are a great number of ways to change, with deployment of DCs being just one way. By this, he means a non-routinised, quick response to fairly new challenges emanating from the environment or to other relatively unpredictable events.

Winter (2000) expands on this by stating that not every change or reaction to environmental shifts will be associated with DCs. The extent of their involvement will depend on the balance of costs of supporting DCs and the benefits following on from their deployment. There are personnel costs associated with the support of particular DCs that are employed for change activities. It is most likely that organisations will invest in DCs only when the opportunities to exercise them arise on a sufficiently regular basis. Otherwise, doing so would

place them at a cost disadvantage relative to their competitors who may rely on cheaper, one-off problem solving.

Teece et al. (2007) consider the development of positions that form organisational processes as being path dependent. Path dependency means that the evolution of DCs follows in sequence and in increments. organisations construct their future positions on their current positions, with certain future positions only capable of being developed through a set sequence of steps. These properties of DC development help to explain why incumbents are often "disrupted" in some industries (Christensen, 1997) by new entrants. DC development is also influenced by the ability of management to discern technological opportunities and correctly assess such opportunities. In rapidly-changing environments, it is essential for management to precisely develop its discernment skills in order to respond to environmental shifts in a timely and comprehensive way.

However, under their idea of DC path dependent evolution, Teece et al. (2007) argue that it is more accurate to describe the development in terms of learning mechanisms. In their view, it is these mechanisms that direct DC evolution. Teece et al. (2007) list the following as learning mechanisms: repeated practice, codification of experience, mistakes, small losses and pacing of experience

Repeated practice is important as it aids individuals to understand processes, thus allowing them to develop more efficient organisational processes, while repeated practice on its own contributes to the development of capabilities; codifying that experience into formal procedures means the experience is easier to apply and helps in developing DCs. In their study on alliance capability, Kale et al. (2002) concluded that the practice of concentrating alliance experience into a specific alliance function (for example, in a formal body or department) more powerfully predicted alliance success than experience on its own.

In addition, mistakes play a role in the evolution of DCs. For example, a rule followed by Yahoo when entering alliances arose from a negative experience it had in an exclusive relationship with a major credit card. The arrangement had the effect of reducing Yahoo's flexibility which led it to terminate the relationship at great cost. Its "no exclusive deals" rule was the product of this failed arrangement. Small losses are another factor. These contribute to learning in that they encourage individuals to pay greater attention to the processes while

not causing overwhelming frustration which would be the result of big losses. Finally, pacing of experience has positively influenced the evolution of DCs as experiences that come about too quickly may cause managers to make hasty generalisations, whereas experiences that happen infrequently can result in forgetting previous lessons.

While all three approaches to the evolution of DCs focus on relevant issues, none explain the mechanism's details. The approach described by Eisenhardt and Martin (2000) comes closest by discussing learning mechanisms but they fail to expound a coherent framework. Zollo and Winter (2002) address this deficiency of earlier attempts by constructing a framework of learning mechanisms that supports DC development.

In the framework created by Zollo and Winter, DCs are formed by the concurrent evolution of three learning mechanisms: experience accumulation, knowledge articulation and knowledge codification.

In general, organisations use a mix of semiautomatic accumulation of experience and deliberate investments in knowledge articulation and codification. They state that, in contrast to the prediction by Teece et al. (1997), organisations integrate, build and reconfigure internal and external competencies not just in rapidly-evolving environments. The term "operating routines" is significant in this definition as, given that these constitute competencies, the terminology can be said to be in line with that of Teece et al. (2007). Zollo and Winter's (2002) definition describes DCs as stable which indicates they are displayed by organisations whose operating processes are developed through process improvement activities that are relatively stable. As above, they also categorise approaches to process improvement activities as experience accumulation, knowledge articulation and knowledge codification. The central focus of their framework is the kind of mix activities that organisations are likely to pursue in different situations.

In environments that can be termed static, it is most likely that organisations will rely on experience accumulation. This is because in such environments even a small amount of learning can give an organisation organisational routines that allow a competitive edge to be discerned for a period of time, which makes DCs redundant. It is usually sufficient for a handful of key people in the organisation to gain experience accumulation in static

environments. However, under conditions of fast change, it may be dangerous to rely on unchanged routines over time. Such conditions may necessitate the development of routines of an even higher level than DCs. A specific investment needs to be made by organisations to develop routines that Zollo and Winter term knowledge articulation and knowledge codification routines. The former include processes by which implicit knowledge is articulated in group discussions, debriefings and performance evaluation processes. Knowledge codification routines constitute a step up from knowledge articulation ones and need a greater amount of cognitive effort. Individuals will nearly always achieve a higher level of understanding during processes of knowledge codification, such as when writing a manual or guidelines. This result of codification is regularly undervalued against more tangible results such as a set of guidelines. However, it represents an important contribution to the evolution of DCs.

Different kinds of learning mechanisms have different costs in investments. The lowest costs are incurred by organisations with experience of accumulation as individuals almost automatically adapt as a reaction to unsatisfactory performance. Higher costs result from knowledge articulation processes because of the time and energy invested to come together and discuss. However, knowledge codification processes need the highest investment as there is not only a requirement to meet and discuss but also to draft a document or fashion a tool (Zollo and Winter, 2002).

There are several instances when deliberate investments are justified as they are likely to bring about higher effectiveness of processes. These are the following (Zollo and Winter, 2002):

- Environmental conditions (e.g. the pace of technological development):
    - In high-tech industries, a trade off occurs between the advantages of cognitive simplification that arise from knowledge articulation and codification and the opportunity costs of time when key individuals are involved in processes of articulation and codification.
    - Knowledge articulation and codification appear superior to experiential knowledge building in less turbulent times.
- Organisational features: in organisations where the management has achieved widespread acceptance of change, higher returns are likely to be produced from learning at any given

level of investment because management tend to be more effective at directing behaviour to exploit new understanding.

- Task features:
  - Frequency: knowledge accumulation is, in general, more efficient at a higher frequency whereas at a lower one knowledge codification increases in effectiveness.
  - Heterogeneity: at higher levels of task heterogeneity, more explicit mechanisms will take on greater effectiveness in comparison to knowledge accumulation.
  - Causal ambiguity: in instances of higher causal ambiguity, learning investments will be more justified because cognitive efforts should help penetrate the ambiguity.

The idea that knowledge articulation and codification are superior when heterogeneity of tasks is high and their frequency is low goes against the current codification logic. As an example, it is probable that a bank will codify its branch operations but not its experience of an acquisition. The reason is the belief that only outputs justify the costs of codification not other aspects such as the learning benefits that can be taken from processes. The framework devised by Zollo and Winter (2002) is an important contribution to the task of re-examining this logic as it highlights that capability building exercises in the form of knowledge articulation and codification routines can affect the organisations performance from a better understanding of operating routines and DCs. In doing so, the framework also helps to build a coherent picture of DC evolution and the development of sources of competitive edge.

It can therefore be concluded that Zollo and Winter's (2002) framework sets out learning mechanisms that underlie the evolution of DCs in a comprehensive way. However, it does not extend to demonstrating how learning bolsters the development of products and services. For this, a model is needed which addresses the links between learning and development of DCs and between DCs and the development of products and services. Just such a model was devised by Helfat and Raubitschek (1997). Its aim was to explain how the concurrent evolution of organisational knowledge, capabilities and products over a long period of time can result in a competitive edge garnered from innovations and links between sequential generations of products. This model is made up of three components: systems of knowledge, product sequencing and systems of learning.

Systems of knowledge are made up of core knowledge and integrative knowledge. Core knowledge is the foundation for (multiple) products and services; integrative knowledge means the knowledge about how to integrate different activities, capabilities and products within or across vertical chains (the sets of activities that bring about the production of a product or service). These two are the basis for the matrix of potential product-market expansion paths. New product introductions that follow from this matrix are called product sequencing. Organisational knowledge is built up through systems of learning that are made up of incremental learning and step function learning. Incremental learning builds upon existing knowledge and does not significantly diverge from it. It can act as the basis of new product generations and also bolsters new configurations of activities due to such enhanced integrative knowledge. In contrast with incremental learning, step function learning involves fundamental changes to core or integrative knowledge. This is why it represents a particularly big challenge for organisations. It also necessitates continuous feedback about products, markets and technologies, all of which points to the need for new knowledge. Benchmarking is a means of providing such feedback and can, when there are wide disparities of the product portfolio of the firm relative to its competitors, signal the need for a major re-evaluation of integrative mechanisms (Helfat and Raubitschek, 1997).

The systems of knowledge and portfolio of products, along with a combination of two types of learning, provide real options for the firm (Brown and Eisenhardt, 1997). In general, firms will begin with different levels of knowledge and product portfolios. From this, they will evolve different configurations of activities, capabilities and products. Newly-developed knowledge will be impacted upon by the previous level and content of knowledge. Gaining success with a specific generation of products will create a richer set of viable real options and platforms upon which to construct future successful product generations (Helfat and Raubitschek, 1997). In other words, there is the potential for one successful outing to develop into another or more; better systems of learning that bolster ongoing product sequencing can act as the basis of a sustainable competitive edge.

Teece et al. (2007) claim that DCs can be broken up into the capacity (1) to sense and shape opportunities and threats, (2) to seize opportunities, and (3) to maintain competitiveness through enhancing, combining, protecting, and, when necessary, reconfiguring the business enterprise's intangible and tangible assets. DCs also extend over the enterprise's capacity to

fashion the ecosystem, such as in the open-user and component innovation it occupies, by developing new products and processes, and by designing and implementing viable business models.

Moreover, Teece et al. (2007) claim that a DCs framework can be used to explain issues such as how a business enterprise and its management can initially discern the opportunity to make financial profits, make the decisions and embed the disciplines to act upon that opportunity, and then stay agile so as to continuously refresh the foundations of its early success, thus creating an economic surplus over time. In conclusion, DCs can help to form competition and marketplace outcomes through entrepreneurship, innovation and semi-continuous asset "orchestration" and business reconfiguration.

Teece (1997) and Porter (1980) both believe that competitive advantage is an important aspect of a firms success but they differ in terms of how this advantage can be achieved. Porter sees that a firm's actions along with their environment (exogenous) determine their success and this include aspects such as government policies and the prevailing economic conditions. Yet he overlooks that market structure is the result of innovation and learning. In contrast, Teece et al. (2007) argue for the importance of DCs (sensing, seizing and managing threats/reconfigurations, which are all endogenous) as central to attaining and sustaining competitive advantage. Therefore, even though creating an enabling environment by the government could improve firm performance, the ability for firms to be able to sense, seize and reconfigure opportunities is even more crucial that the effect of the environment.

2.3.2 Dynamic Capabilities Concept

DCs are an emerging concept in the area of strategic management. The most important contributions to the DC literature include Teece et al. (1997), Eisenhardt and Martin (2000) and Winter (2003).

Teece et al. (1997) made the observation that leaders in the global market place demonstrate prompt reactions and quick and flexible product innovation, as well as the ability of management to manage and redeploy internal and external competencies effectively. Teece et al. (1997) refer to this ability to create new ways of gaining a competitive edge as "dynamic capabilities". In so doing, they emphasise two aspects of strategy that had not previously been

the main focus: the term dynamic emphasises the ability to renew competencies in order to align with an ever-changing business environment, and the term capabilities emphasises the central role of strategic management in adapting, integrating and reconfiguring internal and external organisational skills, resources and competencies, to match the requirements of the environment.

Winter (2003, p. 991) describes DCs as the "ability to reconfigure and change, whereas operational capabilities denote the ability to make a daily living". For their part, Zahra et al. (2006) define DCs as the ability to integrate and build a firm's resources and routines in order to respond effectively to a changing environment as deemed appropriate by its managers. Helfat et al. (2007) argue that DC is the ability of an organisation to purposefully build, expand or alter its resource-base.

2.3.3 Dynamic Capabilities Dimensions

The notion of DCs is built on four main ideas (Koporen and Pohjola, 2007). The first is that DCs give the ability to alter the resource base in relation to the changing environment. Hence, they are more valuable in unstable environments. The second is that DCs can bring about market change, not just respond to it. Added to this, DCs and the development of the market environment are intertwined. Third, the resource base of a firm is path dependent, and DCs can alter these paths. As with the previous point, DCs do not exist separately from the resource base of firms. Finally, DCs are context dependent so that it is impossible to comment on their performance in general or even recognise their existence without taking into account the institutional, environmental and market contexts in which they are found. Teece (2007) and Danneels (2002) argue that the indices of DCs include (1) an ability to sense opportunities, (2) an ability to seize opportunities, (3) ability to implement innovations, and (4) an ability to reconfigure.

The DCs that are proposed as instruments for reconfiguring existing operational capabilities are: (i) sensing; (ii) learning, (iii) integration, and (iv) coordination capabilities (Teece, 2007; Pavlou & El Sawi, 2011; Lin & Wu, 2014; Nieves & Haller, 2014; Tondolo & Bitencourt, 2014; Osisioma et al., 2016; Rezazadeh et al., 2016). The DCs set out below are not exhaustive nor are they enough to bring about reconfiguration but they are believed to be

important enablers for reconfiguring operational capabilities. The reciprocal relationships among these capabilities are theorised in the description of the proposed DCs.

2.3.3.1 Sensing Capability

The business environment is fast changing and for firms to be competitive, they have to be able to sense what is happening in their environment to make informed judgement. This is what Teece at al., (1997) refers to as sensing capabilities and they represent the generation of market intelligence, identification of market opportunities and the dissemination of market intelligence (Tecee, 2007). Generating market intelligence involves identifying what costumers need and this is a respond to the trends in the market (Day, 2011). It is also the detection of resource combinations (Justo et al., 2013) and a recognition of rigidities (Zhou and Li, 2010). Moreover, sensing events and development (Esper et al., 2010), the exploration of newly developing opportunities (Teece, 2007) represents the dissemination of market intelligence. This is because they help interpret market intelligence. According to Tecee (2007), plans to take advantage of emerging market opportunities or to pursue specific segments of the markets are all part of market intelligence for which firms have to respond to the intelligence they have gattered (Tsiotsou and Vlachopoulou, 2011). In summary therefore, firms generate market intelligence to help identify new opportunities for their growth, disseminate market intelligence to respond to customers' needs and respond to market intelligence for new products to meet the needs to the customers.

2.3.3.2 Learning Capability

When a market opportunity is pinpointed, the standard response is the launch of new products. This necessitates making the decision to overhaul operational capabilities that are in place, adding learning, and new knowledge and skills (Teece, 2007). In order for organisation units to make the most of market opportunities in a changing environment, it is necessary to enter into learning to create new solutions, new knowledge, and overhaul existing operational organisation capabilities to create new products. There is a mutually beneficial relationship between sensing and learning capabilities as learning increases the ability of organisation units to pinpoint new opportunities (Zahra and George, 2002). Sensing and learning capabilities are separate – sensing is concerned with the gathering of new market intelligence, and learning is concerned with the use of market intelligence to create new knowledge (Kindström et al., 2013).

These routines have related terms in the DC literature: acquiring knowledge equates to obtaining new knowledge (Camisón and Forés, 2010); assimilating knowledge equates to knowledge articulation (Li et al., 2010) and knowledge brokering (Eisenhardt and Martin, 2000); transforming knowledge equates to innovative problem-solving (Gero and Maher, 2013), brainstorming (Duan et al., 2013) and creative new thinking (Teece, 2012); and exploiting knowledge equates to pursuing new initiatives and seizing opportunities with learning (Teece, 2007), and overhauling operational capabilities (Grant, 2007). Therefore, learning can be seen as an enabler of reconfiguration in the way that it aids in the overhaul of operational capabilities in situ (Zollo and Winter, 2002).

2.3.3.3 Integrating Capability

Integration of new assets and resources helps firms in reconfiguring their capabilities (Galunic and Eisenhardt, 2001). According to Okhuysen and Eisenhardt, (2002), firms must use their shared interaction pattern and collective knowledge to reconfigure their already existing operating capabilities must use shared interaction patterns and collective knowledge (Okhuysen and Eisenhardt, 2002). Shared collective knowledge is important for every organisation or firm to use it's configure its operational capabilities. This is because, as a business unit, every individual has different skills, which are all relevant, and these skills do not work in isolation. Tecee (2007) calls for knowledge integration and interaction pattern into a collective system, which can be better managed as a business unit. This helps spread the contributions of individual input in the business (Okhuysen and Eisenhardt, 2002; Helfat and Peteraf, 2003) and helps explore how individual units based on skills will fit together (Crowston and Kammerer, 2005). In summary, the contribution of integration capabilities is in the fact that it helps merged and gather individual inputs, knowledge sharing and the establishment of a common grounds for operations.

2.3.3.4 Coordinating Capability

Coordination capability is about the administration of resources, activities, and tasks to use the new operational capabilities. This is because the new operational capability has to be efficient and the activities synchronisation (Helfat and Peteraf, 2003). This administration therefore involves the following; 1) Assigning resources to specific tasks (Helfat and Peteraf, 2003). 2) Assigning the correct person to the correct task (Eisenhardt and Brown, 2010). 3)

The Identification of synergies and complementarities between resources and tasks (Eisenhardt and Galunic, 2000). 4) The orchestration of collective activities (Henderson, 2009).

Despite the integrating capability being linked with the coordinating capability in a positive way as coordination is improved by a shared language (Galunic and Eisenhardt, 2001), these capabilities are distinct in theory and in practice (Kogut and Zander, 2006). Where coordination is concerned with synchronising individual tasks and activities, integration is concerned with enabling general collective sense-making and understanding (Crowston and Kammerer, 2008).

The coordinating capability helps in the reconfiguring of operational capabilities in three ways: it allows organisation units to recognise, assemble and allocate resources (Barreto, 2010) by helping the spread of market intelligence across the unit (Vorhies and Harker, 2000); it enables organisation units to match the appropriate individual with the appropriate task (Pavlou and El Sawy, 2011, 1999); and it allows organisation units to better coordinate their jobs and activities (Helfat and Peteraf, 2003).

Teece (2007, p. 1338) argues that: "both innovation and reconfiguration may necessitate assets being combined by management in order for (systemic) innovation to occur". For their part, Okhuysen and Eisenhardt (2002, p. 382) see that appropriate allocation of resources increases the flexibility of organisation units by helping to match the appropriate individual with the appropriate task, which is a crucial part of successful reconfiguration. Similarly, Quinn and Dutton (2005, p. 36) note that: "coordination is the process people use to create, adapt, and re-create organizations". The above analysis and quotes indicate that coordinating capability facilitates the implementation and deployment of operational capabilities that have been overhauled.

2.3.4 Effectiveness of Dynamic Capabilities in Different Environments

Teece et al. (2007) were the first to discuss strategy in dynamic markets in the area of strategic management. They saw the need to conceptualise strategy that would be appropriate for such markets. However, their work was limited as it did not tackle the characteristics of dynamic markets in any kind of detail. Eisenhardt and Martin (2000) tried to address this gap with a discussion on the effectiveness of DCs in settings with different market dynamism.

They take dynamic markets to mean those markets where there are frequent, fast and relatively ad hoc changes in technologies, market participants and successful business models. They determined two general categories: moderately dynamic markets and high-velocity markets.

In the former, changes happen frequently but along fairly foreseeable and linear paths. Industry structures in these are fairly stable. This means that the boundaries in the market are explicit and the players (competitors, customers, complementers) are well known. In such markets, DCs mainly depend on existing knowledge. Managers examine situations in relation to pre-existing knowledge and common practice, and order firm activities in a fairly organised way. Studies by Pisano (1994) and Fredrickson (1984) support the idea that in moderately dynamic markets, better decision-making requires structured, analytic and linear processes. The effective processes studied all shared sequential problem-solving steps that started with a detailed collection of data, the development of alternatives, and then with in-depth analysis of those alternatives which culminated in a choice being made.

In high-velocity markets, on the other hand, market boundaries are unclear, successful business models are not precisely stated and market players are not obvious. The structure of the industry in general is amorphous. In these markets, DCs rely to a lesser extent on pre-existing knowledge and more on the quick generation of situation-specific new knowledge. Effective DCs in these types of environments are uncomplicated and are often made up of only a handful of rules that specify boundary conditions. Yahoo's alliancing process is an example of these. Yahoo management employs two elementary rules when deciding whether to enter a strategic alliance – that there should be no exclusive alliance deals and that the basic service provided by the deal must be free. However, such basic DCs do not need to be wholly without formal organisation. They can give enough structure so that individuals can focus their attention in a setting defined by rapid movements and so they have enough belief in decisions made when it is possible to become easily overwhelmed by concerns. Managers in high-velocity environments depend on creating situation-specific knowledge to make up for the absence of relevant pre-existing knowledge.

Market dynamism has the following effects on DCs (Teece et al., 2007):

- Sustainability of the DCs varies according to the dynamism of the market:
    - In moderately dynamic markets, DCs become robust as managers continue to gain

experience with these routines and implement processes that are easily sustainable.

- In high-velocity markets, DCs become difficult to sustain as there is only a little structure for managers to depend on. This means that developed approaches are easily forgotten. Furthermore, the fragile nature of DCs in high-velocity environments requires managers to constantly expend energy on particular activities.

- Causal ambiguity of DCs varies according to the dynamism of the market:
  - In moderately dynamic markets, causal mechanisms of DCs (i.e. that which influences DCs and what DCs influence in their turn) are unclear as DCs are intricate and hard to observe in such markets.
  - In high-velocity markets, DCs are also causally ambiguous because of their simplicity. This is due to the presence of extensive details which makes it difficult to clearly see the causal mechanism. What emerges in terms of the sustainability issue is that in moderately dynamic markets, competitive advantage is gradually worn away from outside the firm whereas in high-velocity markets this threat comes from inside the firm and from the risk of collapse of DCs.

2.4 Organisational Innovation

Organisations, particularly those which are technologically-driven, need to be more innovative and pioneering than before to lead, to grow, to compete and to endure (Jung et al., 2003). The dual aspects of innovation and creativity have come to be seen as crucial for the competitiveness and success of firms in recent years. Much academic literature has been generated from the first of these. As such, innovation has been broadly defined and employed in a number of different ways (Dobni, 2008; Smith et al., 2008).

The research on it has focused on the approaches, concepts and source of organisational innovation. This will be replicated below.

2.4.1 Concept of Organisational Innovation

Innovation has different facets according to Schumpeter (1934) and involves for instance introducing new procedures, methods, goods, market and organisational structure. It could also be by combining fundamental resources (Croitoru, 2012; Chen et al., 2004). In general,

innovation is seen as the process of applying discoveries and new concepts; the outcome of such a process is the introduction of new outcomes, products and processes (Gloet and Terziovski, 2004). Such discoveries may include new technologies and new products to satisfy consumer's needs (Chen et al., 2004).

Organisational innovation is "the tendency of the organisation to develop new or improved products/services and its success in bringing those products/services to the market" (Gumusluoglu and Ilsev, 2009, p. 467). It is also defined as the organisational capability to refurbish ideas and knowledge into new products, services or processes on a continuous basis for the benefit of stakeholders. Actually, innovation is how pre-existing resources are combined. Much of the literature on innovation views it as the process of using new technology to develop new products. However, the concept of innovation is wider than this as it can mean successfully applying a new idea in an organisation – the place where this occurs in an organisation is irrelevant (Nisula and Kianto, 2013). These authors also believe that innovation is not limited to the process of developing a new product but extends to new processes, strategies, and even business ideas.

Innovation by this definition is a process of both knowledge possession and sharing in order to create new knowledge. Innovation is concerned with building new ideas and knowledge that will help a business to achieve new outcomes. The process behind this is to improve business structures and processes internally to launch products that meet the needs of the market (Plessis, 2007).

2.4.2 Approaches and Considerations of Organisational Innovation

A substantial area of research under the heading of organisational management has been what can be termed organisational innovation and how managers direct, form and manage organisational innovation. There are three general approaches to organisational innovation. First, innovation is a significant factor for improving firms performance (Gumusluoglu and Ilsev, 2009) as the focus of the innovation is for firms to develop new products to satisfy their customers' needs and improve their performance. Second, innovation is as a by-product of flexible development within organisations where the working culture enables workers to express themselves and in such way do things that are innovative which in any case was not

the intentions of management. Third, the performance of a firms is a function of innovation and associated factors (Lawson and Samson, 2001).

Critical analysis of the definitions in the literature indicate that the following three issues should be considered. The first is that innovation cannot be defined in a single-handed way. Innovation could refer to new administrative practices, new technologies, new services, or new products (Hage, 1999). Innovation therefore can either be the development of participation model, introducing new products, improvement of presentation styles and techniques, new additions of existing types and the diversification of the existing services and products. The other consideration is that although generally the properties of an organisation's innovation show consistency, the type and nature of an innovation under investigation alters over the course of many years. In the 1960/70s, organisations in the public sector and their changes were the central focus area. This changed in the 1980s and 1990s to the profound changes in private sector organisations (Hage, 1999). After this, investigations on innovation had a more analytical focus on advanced manufacturing technologies rather than specifying the amount of innovations in a particular time period (Zammuto and Connor, 1992). The third consideration is that the conceptual ordering of organisational innovation by scholars has not provided a logical theoretical framework that defines the concept in all its complexities. As such, the phenomenon remains susceptible to different interpretations and contextualisation (Razavi and Attarnezhad, 2013).

Lam (2004) categorises these diverse interpretations into three. Although there are overlaps in practice, he notes that in theory they are distinct to the point that they prevent developing a clear perspective on organisational innovation and the relationships between its different dimensions. The three categories are:

I. ***Organisational Design Theories:*** This set of theories defines organisational innovation in terms of the structural characteristics of organisations. Scholars such as Mintzberg (1979) and Teece (1998) have tried to determine the effects of organisational structural variables on product and process innovation through a focus on the extent to which organisations innovate according to their structural forms.

II. ***Theories of Organisational Cognition and Learning*:** These theories see organisational innovation in terms of micro-level cognitive foundations of organisations. By placing an emphasis on the learning and organisational knowledge creation process, researchers investigate innovation capabilities of organisations

according to their ability to form and exploit new knowledge (Nonaka and Takeuchi, 1995).

III. ***Organisational Change and Adaptation Theories*:** These theories define innovations as the results of the creation of new organisational forms and sees innovation as the response to change in the external environment and the influences, which shape it (Child, 1997).

Innovation is required for maintaining competitive advantage and that is why management of creativity are key to innovation and hence competitive advantage (Drucker, 1985; Woodman et al., 1993). As a result therefore, managers give priority to developing mechanisms that increases reativity and innovation within the organisation.

2.4.3 Sources of Organisational Innovation

A great deal of research has focused on understanding the different sources of innovations (e.g., organisational, individual and environmental characteristics) (Crossan and Apaydin, 2010; Damanpour and Wischnevsky, 2006; Taylor and McAdam, 2004). The following section therefore provides a review of these literaures.

2.4.3.1 Individual Factors of Organisational Innovation

A number of individual factors have been found that impact on the adoption of organisational innovation by firms. In terms of managerial characteristics, these include attitude to technology and change process (Piaralal et al., 2016), leadership (Tsai, 2010), formal education (Laforet, 2011), risk propensity and self-efficacy (Chong and Ma, 2010), as well as favourable attitudes to innovation (Damanpour and Schneider, 2009). Employee characteristics must also be taken into account. These include individual learning (Jensen, Johnson, Lorenz, and Lundvall, 2007), competence (Johannessen, 1997), and skill base and readiness (Snyder-Halpern, 2001).

2.4.3.2 External Factors of Organisational Innovation

It is noteworthy that external factors, for example, industry and global factors, since organisations have not been given as much attention, however they do correlate with organisations adopting innovation. In global factors there exists regulatory restrictiveness, demographic dynamism, technology dynamism, organisation competitiveness, external

pressure/supplier pressure, market uncertainty, and customer demand (Pasqualotto, 2015). Regarding industry factors, the exchange of information across firms, industry competitiveness, and supply chain/vertical boundaries (Mehrtens et al., 2001) can be grouped together. Walker (2008) examined the effects of environmental characteristics, e.g. population increases, diversity of needs, service needs, and the erratic political climate on adopting innovation in English public services.

2.4.3.3 Organisational Factors of Organisational Innovation

These factors have been the most extensively researched in the literature on the adoption of organisational innovation (Ganter and Hecker, 2014). This is because, in general, the structural and functional characteristics of organisations have been the main focus of this research area (Oldham and Hackman, 2010). It has been suggested that a focus only on the structural aspects of organisations gives too basic a picture of innovation and there may be more influential background management mechanisms within an organisation which have an impact on innovation such as strategy (Ayuso et al., 2011).

However, size and structure have been found to be the most consistently influential factors on organisational innovation. A study found, for instance, that the larger the organisation, the more likely it is to employ innovation (Alshamaila et al., 2013), due principally to the fact that they have more resources and leeway to do so. Structural complexity has also been found to impact on the adoption of innovation. The more complex the structure of an organisation, the more likely it is to be innovative (Pietrobelli and Rabellotti, 2011). A number of other studies have looked at different organisational factors to see how they correlate with organisational innovation. For example, Bowen (2010) used a meta-analysis of the connections between thirteen potential organisational determinants and innovation adoption and discovered that that amount of innovation organisations adopt within a given time frame is dependent on centralisation, professionalism, internal communication, administrative intensity, managerial attitude towards change, functional differentiation, external communication, specialisation, technical knowledge resources, and slack in organisations.

As this research is about TMT, its focus will be on TMT knowledge as a source of innovation in organisations. One of the major challenges in innovation management is to exploit existing

knowledge whilst exploring new knowledge or achieving organisational innovation (Andriopoulos and Lewis, 2009; Birkinshaw and Gupta, 2013; Nosella et al., 2012; O'Reilly and Tushman, 2008; Turner et al., 2013). The idea of exploitation and exploration (March, 1991) is a powerful theme in the research into innovation (Danneels, 2002; Lee et al., 2003; Rothaermel and Deeds, 2004). Different literatures claim that an organisation needs to pursue greater levels of innovation (Gibson and Birkinshaw, 2004; He and Wong, 2004) and construct exploitative and exploratory innovations simultaneously in various organisational units (e.g., Benner and Tushman, 2003; Tushman and O'Reilly, 1996). The units participating in exploratory innovation have tried to gather fresh knowledge and pursue the development of services and products for emerging markets or customers. Units pursuing exploitative innovation build upon pre-existing knowledge and increase existing services and products for existing customers (Benner and Tushman, 2003, p.243). Even though the worth of pursuing both of these kinds of innovations has reached a consensus in the literature, there is more which still needs to be understood regarding how an organisation orchestrates developing both exploitative and exploratory innovation in organisational units.

2.4.3.4 Exploratory and Exploitative Innovation

Firstly, it needs to be noted that there is a lack of systematic evidence regarding if units use different coordination mechanisms to develop exploitative and exploratory innovation. Even though past research asserts that organisation antecedents have different influences on exploitative and exploratory innovations (O'Reilly and Tushman, 2007; Andriopoulos and Lewis, 2009), ground research which examines these relationships with incremental and profound innovation types have not given a definitive result (Cardinal, 2001). Therefore, it seems that the main principle of units which use diverse coordination mechanisms for exploitative and exploratory innovation is still not proven. This mixture of findings might result from past research using the business or firm unit as a unit of analysis, overlooking the issues that innovative organisations may distinguish coordination mechanisms at the organisational unit level. Additionally, the research focuses on formal hierarchical structures, therefore not realising the increased importance of informal social relations in the orchestration of developing exploitative and exploratory innovations (Subramaniam and Youndt, 2995).

Researchers have debated how exploitation activity allows an organisation to improve resources research with central structuring. Even though this structuring supports innovation exploitation types, the evidence demonstrates that it restricts communications between departments and decreases both the quantity and quality of the organisation's available information. Thus, employees' motivation and skills are not adequate in the producing innovative and new ideas (Fernandez and Moldogaziev, 2012). Conversely, the evidence shows that should exploratory innovation be used then there is an increase in lateral communication and therefore there is support for the exploratory research. This produces new information in the centrifugal structure (Blindenbach et al., 2014). The organisations which simultaneously used exploration and exploitation practices create structures which are centrifugal and flexible and which can respond instantly to external environmental changes but which are mechanical and centralised with strict business processes and rules regarding the efficient and effective use of the resources available (O'Reilly and Tushman, 2004). That is, it can be argued that focussing solely on exploitation causes organisations' performance to increase over time, and also means that an organisation loses its ability to react to changes, whilst overly focusing on exploration causes the organisation to repeat itself in an ongoing research cycle in spite of information-based renewal (Raisch and Birkinshaw, 2008).

Researchers have argued that those who defend structural innovation attempt to differentiate through use of organisational strategies and structures in this direction. To accomplish this, they focus on exploitation and exploration tactics which will encourage innovation (Gupta et al., 2006). It would appear that those who defend contextual innovation focus more on the social and behavioural aspects of the dual structure, which aims to establish a working environment where cooperation with a sense of shared values can be built through team building, human resources, socialisation etc. (Andriopoulos and Lewis, 2009). Yet, both sides choose to design the management process by compensating for such dual tensions in the organisation with, paradoxically, thought rather than the exchange of it (Lewis, 2000).

2.4.4 Organisational Innovation in Saudi Arabia

Saudi Arabia is still looked upon as merely a supplier of crude oil by the rest of the world. Just two decades ago, Saudi Arabia seemed an unlikely place for a major drive at industrialisation (Ramady, 2010). However, it has made significant changes in its development in all areas. The country is now considered an emerging and quickly-developing nation among its peers. The positive economic results seen since 2010 are a reflection of the

efforts by the Saudi government to increase private business activity and investment. This is part of its effort to become a top-ranking business-friendly destination through its policies and procedures. In terms of organisational innovation, strategic partnerships have been built by the government with universities and corporations, not to mention the establishment of King Abdul Aziz City for Science and Technology (KACST). Recently, General Electric established an innovation centre with the aim of encouraging local innovation. Moreover, SABIC (the country's largest petrochemical company), 3M and others have also opened innovation centres. In 2013, Saudi GDP hit a record high of $745 billion, making it by far the largest GCC and Arab economy, and the 19th economy globally, larger than countries such as Switzerland, Sweden, Norway and Iran. However, it can be noted that the drop in oil prices in 2013 meant there was only modest growth of roughly two percent in GDP compared to much larger growth in previous years (Arab News, 2013).

The Saudi government has made the link between the development of a knowledge-based economy and increasing organisational innovation production (Al-Othman and Busch, 2009). However, the link between the level of knowledge in the broader community with the organisational innovation of organisations is unclear. It can be argued that a higher level of knowledge will create greater organisational innovation (Evangelista et al., 1998). However, there is a lack of clarity as to how knowledge contributes to increased organisational innovation of organisations. In particular, it is unknown how the knowledge cycles combine to positively influence the organisational innovation production of organisations (Darroch and McNaughton, 2002).

Saudi Arabia's membership in the WTO indicates clearly that it wishes to be a major partner to other economies. The move away from a natural resource-based economy to a knowledge-based economy does not happen easily or in an unsupported way. Carefully-drafted policies are needed which are built on accessing information about how other countries have managed similar transitions. Most countries developed their knowledge-based economy from a much more balanced and stable foundation than Saudi Arabia in relation to social, technological and economic areas. As well as external sources, research specifically directed at tackling the problems of Saudi Arabia is also necessary as a means of restructuring Saudi Arabia (Darroch and McNaughton, 2002).

The US-Saudi Arabian Business Council asserted in its Economic Review of 2014 that:

> "… preliminary macroeconomic data for 2014 indicate that the Saudi economy continued its strong performance from prior years. For 2014, the Ministry of Finance estimates that real GDP is expected to reach 3.59 percent compared to 2.67 percent in 2013. Over the same period, inflation remained low at 2.7 percent for 2014. In current prices, nominal GDP is anticipated to reach $752.5 billion (SR2.822 trillion), a 1.09 percent increase compared to 2013. Meanwhile, non-oil GDP is expected to grow by 8.21 percent, the non-oil public sector is expected to increase by 6.06 percent, the non-oil private sector is expected to increase by 9.11 percent and the oil sector is estimated to decline by 7.17 percent (US-Saudi Arabian Business Council, 2015)".

An issue that is of concern is the one noted in the UNESCO report of 2010. In this it was stated that countries like Saudi Arabia which are oil rich need to invest more in research and development compared to other countries.

2.5 Performance

Performance has been given attention in academic literature for a considerable amount of time as a means of measuring the quality of a firm (Tseng et al., 2013). This factor is important as it acts as an analysis of a measurement and a means of comparison of an achievement that results from a specific goal achievement (Yang, 2012a). Performance is attached to a multidimensional conceptualisation related predominantly to stakeholders, heterogeneous market circumstances and time (Richard, 2009).

Performance has been defined as the ability of an organisation to build employment, and increase effectiveness, efficiency and quality of work/life which results in organisational growth and survival (García-Morales, Moreno et al., 2006c). It has been identified as a complex and multidimensional concept (Prieto and Revilla, 2006) that comprises quantitative and qualitative components. As discussed, stakeholders consider different criteria when evaluating organisational performance (Espinosa and Porter, 2011).

Shareholder and stakeholder are the two main perspectives on performance. The focus of the former is on optimising the internal processes of a business for the sole benefit of shareholders (Neely, 2002). From this perspective, performance measurement has mainly

been done with financial performance indicators such as sales growth and return on assets (Hubbard, 2009). As for the latter perspective, it attempts to attend to all of the interests of stakeholders, including among others, those of investors, suppliers, customers.

An additional research group has described performance as "the economic outcomes resulting from the interplay among an organization's attributes, actions, and environment" (Combs et al., 2005, p. 261). According to this, performance can be considered synonymous with the concept of financial performance or corporate economic performance (Hamann et al., 2013).

From another standpoint, firm performance can be considered through two broad approaches: objective and subjective. The former uses the absolute values of performance measures such as sales growth and profitability (Greenley, 1995). These are obtained either by requesting them from respondents or from an examination of secondary sources (Vorhies & Morgan, 2003).

Richard et al. (2009) state that performance has three specific firm outcome areas: (a) financial performance (e.g. profit and return on assets); (b) product market performance (e.g. market share and sales); and (c) shareholder return (e.g. economic value added and total shareholder return).

Noruzy et al. state that performance is the main objective of an organisation's business process (2010). As such, all organisations wish to find ways to improve and grow their performance. It is also defined according to how well an organisation measures its effectiveness (Dirani, 2009), or how the organisational input compares with outcome. A number of studies have shown that performance is impacted on by features inherent to organisations (Martinez, 2009; Wetherington, 2010; Ellinger et al., 2002; Hung et al., 2010). Some research has also made use of financial performance (Noruzy et al., 2010; Sahaya, 2012) such as profitability, sales, sales growth, and return on investments. Others have used non-financial performance measures such as organisational commitment, job satisfaction, and other outcomes which are work related (Balay, 2012; Egan, Yang & Bartlett, 2004; Rose, Kumar & Pak, 2011; Chiva & Alegre, 2009; Hsu & Pereira, 2008).

Although organisation performance can be measured with both financial and non-financial measures, the majority of research in this area has had a financial bent, focusing on accounting measures of performance. O'Regan et al. (2008) claim there has been a shift towards much broader measures of performance that consist of both financial and non-financial measures.

2.6 TMT, Dynamic Capabilities, Organisational Innovation and Performance Alignment

2.6.1 Top Management Teams and Performance

A great deal of research has indicated that TMTs play a central role in influencing firm performance (Certo et al., 2006). Particularly, the demographic diversity of TMTs has been shown to have major performance implications (Cannella et al., 2008). This is based on the belief that TMT demographic diversity is associated with team behaviours, which are themselves integral to effective management. Therefore, it is likely to influence performance (Carpenter, 2002). Researchers have followed this reasoning and so broadly applied TMT demographic diversity to predict firm performance. However, these findings have been inconsistent. While some researchers have seen positive effects, others have found negative or non-significant effects of such demographic diversity (Nielsen and Nielsen, 2013; Wei and Wu, 2013). In order to be comprehensive and to better illustrate previous findings, earlier research has been classified and reviewed according to these results (i.e. positive, negative, and non-significant).

Pegels et al. (2000) showed a strong link between TMT demographic diversity and competitive market behaviour and subsequent performance of firms. In line with this, Barsade et al. (2000) carried out research on 62 US TMTs. They showed that TMT functional diversity was positively associated with firm stock market returns. Carpenter (2002) also found that TMT educational, functional and tenure diversity positively influenced firm performance at low levels of environmental complexity. Dwyer, Richard and Chadwick (2003) indicated there was a positive relationship between the gender diversity-growth orientation interaction and performance. They also claimed that gender diversity provides a team with novel insights, perspectives, creativity and experience, and this may encourage and aid expansion into new markets.

Gong (2006) gives evidence about the positive benefits of nationality diversity in TMTs on subsidiary performance. His findings show that such diversity is crucial to creating a successful subsidiary. Moreover, Nielsen and Nielsen (2013) claim that nationality diversity aids firm performance by giving access to diverse institutional experiences and multiple information processing. As well as these fieldwork studies, Certo et al. (2006) conducted meta-analysis to understand the relationship between TMT diversity and firm performance. Their analysis of previous studies reveals that, even though diversity in terms of demographics, such as functional backgrounds, experience and tenure, clearly boosts return on assets, this is not necessarily the case for every demographic and performance indicator.

TMT demographic diversity has been reported to offer beneficial multiple skills, knowledge and perspectives which provide firms with an increased level of information (Certo et al., 2006; Shin et al., 2012). This is principally based on the information/decision-making perspective (Williams and O'Reilly, 1998), which indicates that diversity gives a greater range of task-relevant knowledge and skills to the team, as well as varied viewpoints which improve their function and performance (Homan et al., 2008; Kearney, Gebert and Voelpel, 2009; Nielsen and Nielsen, 2013; Wei and Wu, 2013).

On the other hand, Amason, Shrader and Thompson (2006) claim there are negative effects from TMT demographic diversity (i.e. age, education, and functional background) on the performance of new ventures, seen in their sales growth. Their study shows that teams bound together by similarities were more successful when the ventures were very new because of their ability to engage in informal, regular and close interactions. Similarly, Olson, Parayitam and Twigg (2006) indicated that age diversity negatively correlated with strategic choice and firm performance.

2.6.2 Top Management Teams and Dynamic Capabilities

In 1959, Penrose and Pitelis set out the "resource based view" of organisations (Penrose and Pitelis 2009). According to them, companies are an accumulation of material and immaterial resources. Success and failure can be explained by the particular resource base of companies instead of by their environment (Penrose and Pitelis, 2009). However, this perspective has

fallen out of favour and is now viewed as simplistic and an awkward reworking of established doctrine (Kraaijenbrink et al., 2009).

However, the resource-based view has acted as a stepping stone in the development of organisational research, with their ideas being challenged (Barney, 2001; Kraaijenbrink et al., 2009). Based on this, academics have devised a capability based view of the company (Helfat and Peteraf, 2003; Nelson and Winter, 1982; Teece, 2001), arguing that there many capabilities that can be used to organise and control the use of resources which are particular to each organisation (Nelson and Winter, 1982).

The issue of how TMT characteristics and DCs relate to each other is still unclear (Proeller et al., 2011). Moreover, Andrews et al. (2009) argue that a sole rational planning approach, i.e., just having in place a formal planning process, does not create performance and innovation effects. TMT DCs use TMT knowledge taken from their internal and external networks, and this is the means by which they plot a strategic course. Upper Echelons Theory set out by Hambrick and Mason (1984) suggests that the relationship between TMT and the organisational outcomes of strategic choices and performance levels should be examined. A number of other scholars have agreed with this perspective and found a connection between TMT characteristics and strategic innovation and performance (Bantel and Jackson, 1989; Norburn and Birley, 1988). A TMT DC deduced from the Upper Echelons perspective is the ability of an organisation to predict and respond to opportunities or requirements for change, both internal and external (Wiersema and Bantel, 1992). This asset employment is called a DC, referring to management capability development and hard-to-copy combinations of technological, functional, and organisational skills to obtain and maintain competitive advantages (Teece et al., 1997). The TMT has a primary role in the process. DCs need TMT characteristics to evolve a total organisational coherence while recognising the specific characteristics of the external and internal environments.

2.6.3 Top Management Teams and Organisational Innovation

According to the Upper Echelons perspective, TMT perceptions and cognitive bases should have an influence over strategic choice and as a corollary, organisational outcomes. This perspective indicates that managers' demographic characteristics act as a proxy of the cognitive values and bases which are assumed to influence organisational innovation and

strategy. This means that a link is expected between organisational performance and business strategy, and demographic characteristics.

Yet, analysing the direct relationships between organisational outcomes, strategic decisions, and executive characteristics, generates inconsistent findings (Hambrick et al., 2005). TMTs have a lot of discretion in the setting out of organisational strategy (Finkelstein and Hambrick, 1990; Pegels et al., 2000). However, manager discretion varies between one industry setting and another. Some theoretical developments regarding executive job demands offer additional insight into managers' role in strategic decision-making and the subsequent implications. Executive job demands means the how much an executive sees their work as challenging or difficult (Hambrick et al., 2005, p. 473). Environmental factors are one if the vital aspects which contribute to executive job demands, since they are responsible for aligning the environment and the organisation. When additional job demands are made on them, managers increasingly rely on experience in strategic decision-making. Hambrick et al. (2005) argued that the making of decisions by executives under significant job demands might reflect their functional background, education experience and tenure and age to a large extent as they attempt to "economize" this decision-making. Job demands can moderate the relationship between decisions and management experiences. It is likely that executive job demands have a major impact on leadership and strategic choice but this is unsupported because of the lack of research about this (Hambrick et al., 2005).

2.6.4 Dynamic Capabilities and Organisational Innovation

In 1934, Shumpeter was the first scholar who defined innovation as generating new processes and products, new markets and supply sources, and unique ways to organise business. Scholars (e.g. Rogers, 2003; Damanpour and Schneider, 2006; Dobni, 2008; Goffin and Mitchell, 2010; Norman and Verganti, 2012) view innovation as one of the processes which when continuously repeated can assume many forms. Innovation's aim is to use recent opportunities and conditions which have been shaped in the environment for creating new value and achieve a competitive advantage (Damanpour and Schneider, 2006; Dobni, 2008). Implementing and realising innovation guarantees increases in the whole enterprise's competitive advantage. Thus, in today's global markets, innovations are thought to be the

basis of inevitable change (Vanhaverbeke et al., 2007; Bekkers et al., 2011; Baregheh et al., 2012).

Jimenez-Jimenez and Sanz-Valle (2011) stated that in the scientific literature innovations are usually conceived of as adapters of changed behaviour, results, or new ideas.

Many misunderstandings arise in an analysis of the different variables inside DCs and organisational innovation relations. The reason for this is an incomplete DC theory. Even though this concept has been examined from various attitudes and perspectives, the relationship with other variables, such as networks, organisational learning, innovation, and others, is still not clear. Further, it is vital analyse these relations since DCs have an insignificant direct impact on organisational performance results (Protogerou et al., 2008).

Some scholars have argued that simply holding common resources and capabilities may not be enough for organisations to become innovative. They also be able to mobilise their capabilities and resources to meet changing environmental opportunities (Liao et al., 2009). Regarding this, DCs can be differentiated from common or operational capabilities regarding their relationships with change (Ambrosini and Bowman, 2009; Wang and Ahmed, 2007). In particular, where common capabilities focus on performing the necessary daily activities to offer services, DCs dynamically choose services which match changing environments (Pavlou and El Sawy, 2011). There is an objective in this research to advance the field of performance and innovation by connecting DCs with innovations in the construction industry. In this industry, this research proposes that both an environmental orientation and the ability to take advantage of the opportunities that this environment has are required. Such advantages are in the form of sensing and learning capabilities. For its part, process innovation mainly has an internal focus. Therefore, it can be improved through an organisation's ability to generate a collective logic of interaction by integrating and coordinating capabilities by combining and integrating individual internal inputs.

2.6.5 Dynamic Capabilities and Performance

Capabilities are crucial for a firm's development. As they are often located in intangible resources, they are hard to imitate and so can be said to be firm dependent (Shane, 2002). It is their unique character that makes capabilities a source of competitive advantage. However, Eisenhardt and Martin (2000) claim that the value of DCs for competitive advantage can be found in the resource configurations that they create. This leads them to conclude that DCs

have equifinality, are replaceable and mutually interchangeable, and so many firms in fact have similar DCs.

According to Zott (2000), there is a general lack of knowledge about the ways in which DCs affect the emergence of differences in intra-industry firm performance. On one end of the spectrum is the argument by Teece et al. (1997) that there is an explicit link between DCs and competitive advantage. The conclusion is a circular one in that if an organisation has a DC, it must perform well, and if performing well, it should have a DC. At the other end, Zott (2003) claims that DCs are indirectly linked to the performance of organisations as the aim is to change a firm's bundle of resources, operational routines and competencies, which in turn affects economic performance.

Wilden, Gudergan and Lings (2013) argue that DCs affect organisational performance indirectly and directly, and that the indirect positive influence on performance is achieved through creating, extending and modifying the resource base (Eisenhardt & Martin, 2000; Helfat et al., 2007; Kale, Dyer & Singh, 2002). Moreover, they state that DCs have a direct effect on performance from a cost perspective as costs are created by the creation, maintenance and use of DCs.

While exploring the link between DCs and performance, Protogerou, Caloghirou and Lioukas (2012) found that the direct effect of DCs on performance was not significant and that DCs affected operational capabilities; this in turn impacted performance.

2.6.6 Organisational Innovation and Performance

An uncertain and strongly competitive nature of a business environment makes innovation crucial if firms wish to survive. Confronted with an upward market and business turbulence, a firm needs to engage with innovation (Damanpour & Gopalakhrisnan, 2001; Hurley & Hult, 1998). This means that only those firms that pursue innovation in order to achieve "innovative organisation" and so fully grasp the knowhow process of daily operations will survive. Organisations actively seek to innovate as a way of acquiring new knowledge, new process and new products and services in order to strongly connect with organisational performance (Aragon-Correa et al., 2007).

In order to remain responsive, organisations must meet the needs of customers and the demands of investors through its capabilities and communication among members. Research in this area suggests that organisational performance is impacted upon by organisational innovation in a number of ways, as demonstrated by Hurley & Hult (1998) who integrated market orientation and organisational learning with innovation. Calantone et al. (2002) also contribute to this by suggesting that innovation design and innovation speed are positively related to organisational performance. Irwin, Hoffman & Lamont (1998) also found from their research that unique product innovation resulted in improved performance. Hult, Hurley, & Knight (2004) conducted fieldwork from which they found that market orientation, learning orientation, entrepreneurial orientation and innovation related to organisational performance and caused an organisation to become more adaptable.

2.7 Mediating Effect of Dynamic Capabilities

The Resource-Based View (RBV) is a method used to identify competitive advantage in the form of resources instead of the traditional product-market view. Barney and Wernerfelt are two reputable researchers in resource-based theory so their definitions are generally accepted among scholars. Barney (1986, p. 101) defines resources as "all asset, capabilities, organisational processes, firm attributes, information, knowledge, etc. controlled by a firm that enables a firm to conceive of and implement strategies that improve its efficiency and effectiveness". Wernerfelt (1997, p. 172) states that a "firm's resources at a given time could be defined as those (tangible and intangible) assets which are tied semi-permanently to the organisation". Examples of such resources are: brand names, in-house knowledge, employment of skilled personnel, trade contacts, machinery, efficient procedures and capital.

Successful firms in the global marketplace are those that have been able to demonstrate timely responsiveness and fast, flexible product innovation, in addition to effective coordination and redeployment of internal and external competences by management (Teece, 2009, p. 555). Teece (2009) refers to this ability of DCs to emphasise two key aspects that have not been given a great deal of attention in the strategic management literature. The term "dynamic" used here refers to the capacity to renew competences in order to achieve congruence with the changing business environment in which there is a rapid rate of technological change and where the nature of future competition and markets is difficult to

determine (Teece, 2009). It is clear that TMT has a large part to play in terms of this perspective and is the reason why the Researcher intends to focus on the characteristics of TMTs to understand the effects that it can have on organisational innovation.

A general conclusion that can be taken from the literature is that DCs may be rare or at least may not be held by all competitors equally (Eisenhardt and Martin, 2000). Furthermore, Eisenhardt and Martin (2000) state that DCs can be a source of competitive advantage but are not sustainable as many of the resources under resource-based theory are. This is the main difference between a resource and a DC. Small- and medium-sized organisations and new ventures will need novel and DCs that act as the basis for them to survive, achieve legitimacy and reap the benefits of their innovation (Zahra Sapienza et al., 2006).

A well-composed TMT seems to meet these criteria to a certain degree as TMTs can be imitated and are often non-sustainable. In this regard, a TMT can serve as a DC, especially for start-ups, where the TMT has a great impact on every part of the organisation (Shrader and Siegel, 2007). Verona (1999) claims that the influence of a strong TMT can positively affect the result of product development. It is also of importance to clearly highlight the relationship between capabilities and performance in product development. Teece (2004) argues that the ability to identify opportunities is largely dependent on the individual's capabilities and extent of knowledge, particularly about the needs of the users and customers in relation to existing and new solutions. Teece (2009) also states that the competitive edge of organisations lies within its managerial and organisational processes. These are formed by its asset opposition and the paths available to it. Deed et al. (2000) state that the skills, knowledge and background that executives bring all play a crucial role in determining the organisations strategic choices. However, top managers impact organisational innovation indirectly; more studies are needed to investigate the factors that mediate the relationship (Elenkov and Manev, 2005). In this context, DC as a mediator factor has not yet been comprehensively investigated. This limits our understanding about the important role of this mediator in explaining the link between top managers and organisational innovation (Hsu et al., 2008; Penrose and Pitelis, 2009).

2.8 Need for Improvement in the Saudi Arabian Construction Industry

The construction industry is reported to make a substantial contribution to the Saudi Arabian economy. Ikediashi et al. (2014) report that it contributes 40% of Saudi GDP. This contribution notwithstanding, the industry has been under investigation for poor performance (Almahmout et al., 2012; Ali et al., 2013). Client satisfaction is reported to be at a low in the construction industry, which has been blamed on the low level of innovation (Abdul-Hadi et al., 2005). Research by Trigunarsyah and Al-Solaiman (2015) indicates that client satisfaction is also low due to delays in projects being completed (Al-Kharashi and Skitmore, 2009; Faridi and El-Sayegh, 2006;); poor health and safety performance (Al-Haadir and Panuwatwanich, 2011; Jannadi and Bu-Khamsin, 2002); poor awareness of technologies usage, such as BIM (Sodangi et al., 2018); poor knowledge management implementation (Abukhader, 2016); and regular project overspend. Mahamid (2016) categorises the main causes of poor performance in this Saudi industry into poor communication among project participants, poor labour productivity and poor planning and scheduling.

After performing an analysis of the industry, Ikediashi et al. (2014) set out eight factors which they believe are responsible for the high failure rate: (1) project management deficiencies, (2) risk challenges, (3) project team commitment, (4) ethical issues, (5) government interference, (6) constraints imposed by stakeholders, (7) financial and schedule challenges, and (8) user requirements (Ikedashi et al., 2014). A cursory glance at these factors points to the fact that management plays a major part in poor performance. This points to the need for improvements in management within which the role of TMT cannot be overemphasised.

A number of suggestions have been made to improve performance in the Saudi Arabian construction industry. For example, Sarhan et al. (2017) argue that this could be done by adopting lean construction principles. Similarly, Mazher et al. (2015) recommend total quality management principles as a solution. For their part, Panuwatwanich et al. (2017) believe that improving the safety culture and climate would be a major step forward for the industry. Sustainability is another area in which there are calls for improvements. Banani et

al. (2016) specify that this area could be tackled through the development of criteria for assessing the sustainability of building projects.

From a review of the current state of the construction industry in Saudi Arabia and the need for better performance, it can be argued that innovation will play a key part in producing greater client satisfaction and better management of projects.

2.9 Overview of the Upper Echelons Theory and other Theoretical Approaches for Understanding TMT Characteristics

In th following subsections more discussion will be provided regarding the Upper Echelons Theory, Dynamic Capabilities and Resource Based View Theory, and Contingency Theory to Organisational Innovation.

2.9.1 Upper Echelons Theory to TMT Characteristics

The premise of Upper Echelons Theory is that the strategic choices that executives make are directed by their own experiences and biases. The theory argues that demographic information is a good measuring tool for these constructs. Finkelstein and Hambrick (1996) set out a TMT model that explains the relationship between top managers, the strategic decision-making process and organisational outcomes. Upper Echelons Theory is explained in Figure 2.1. Using the theory of social psychology, these authors explain how contextual factors such as the environment and the organisation itself directly lead to the composition, structure and processes of TMTs. In their turn, these direct the strategic decision-making process to create organisational outcomes such as strategy and organisational performance. TMT members collaborate throughout, with the TMT composition, structure and process necessarily affecting the results of this collaboration. The composition of the team relates to its homogeneity/heterogeneity, in other words, the degree to which TMT members are demographically similar or dissimilar.

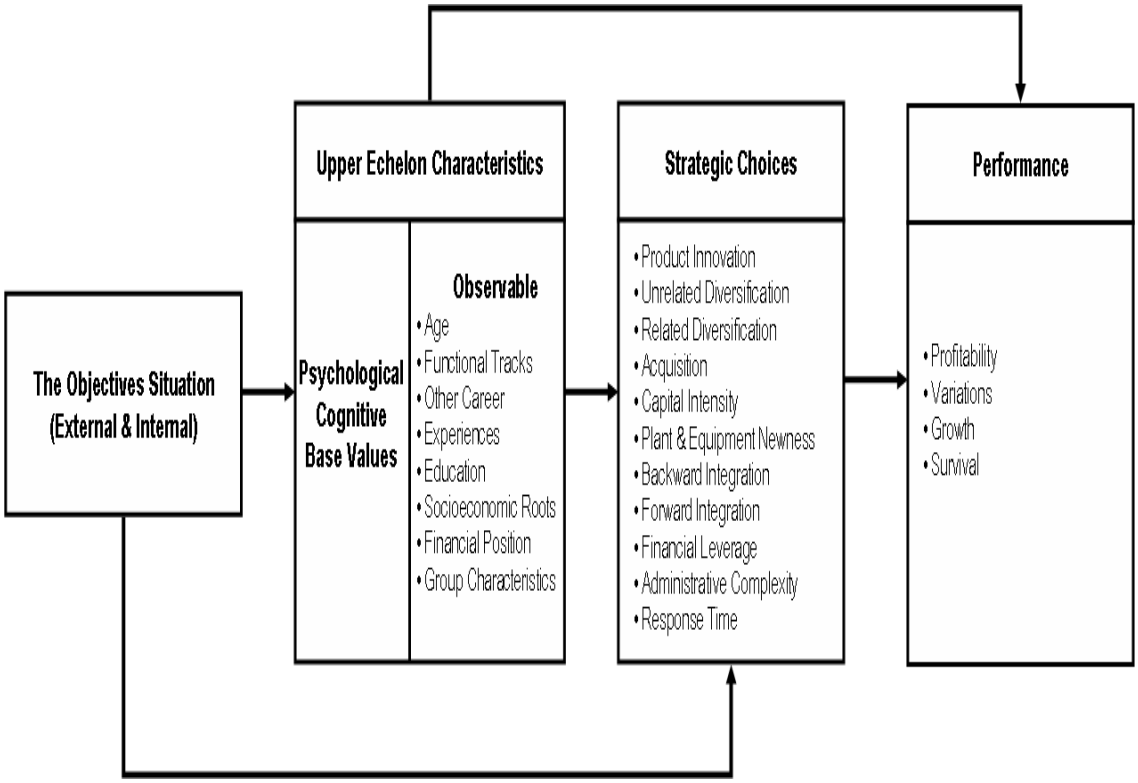

Figure 2-1 Outline of Upper Echelons Theory (UET)
Source: Hambrick and Mason (1984).

2.9.2 Dynamic Capabilities and Resource Based View Theory

Most scholarly output on organisational performance has focused on DCs and RBV theory. RBV considers resources to be key assets of organisations which themselves have the potential to produce competitive advantage. These ideas were taken up by other scholars who focused on specific aspects, such as architectural innovation (Mehrizi and Rodon, 2014), configuration competence (Kor and Mesko, 2013), and combinative capabilities (Lin and Wu, 2014). Teece et al. (1997) went further by developing the notion of DCs, and in a later work, establishing a framework for DCs (Teece, 2007). Teece and his colleagues (Teece et al., 1997; Teece, 2007) claim that competitive advantage in uncertain environments is a function of DCs instead of competitive positioning or industry conflict. As stated in the literature, the DC perspective follows the RBV (Makadok, 2001; Pavlou and El Sawy, 2011). RBV emphasises resource picking whereas DCs emphasises resource renewal. Given that managers are regularly confronted with the need to renew existing operational capabilities, creating ones that are more in line with a changed environment, engaging with DCs can be said to be an important hurdle for managers in their efforts to produce a sustainable competitive advantage. If we are to gain an understanding of DCs, it is therefore important to recognise how they differ from the operational capabilities that they are trying to reconfigure.

2.9.3 Contingency Theory to Organisational Innovation

In the field of organisational innovation, it is accepted that there is "one best way to organise". Researchers who have been most influential on this are Weber (1947) and Chandler (1962), having respectively conducted research on bureaucracy and the multidivisional form. However, during the 1960s and 1970s this was challenged based on contingency theory which explains the variations in organisational forms being due to the different contexts that they operate under. Contingency theory claims that the ideal structure for an organisation is one that best fits a particular operating contingency, such as the operating environment (Burns and Stalker, 1961); the scale of operation (Blau, 1970); and the technology available (Woodward, 1965). This theory points to an understanding of how an organisation's activities relate to technological environments, structure and performance. The opposing typologies posited by Burns and Stalker (1961) of "mechanistic" and "organic" organisations shows the degree to which organisational structures and innovation

management are affected by differences in technology and complexity of the market environment.

The field of strategic management places a great deal of emphasis on a organisation's competitive environment. The literature claims that the effectiveness of a strategic orientation (Hambrick, 1983; Snow and Hrebiniak, 1980), entrepreneurial orientation (Boling et al., 2015), or innovativeness (Dotzel et al., 2014) is largely dependent on environmental aspects. Dotzel et al. (2014) claims that less research has been done on the contingency view that emphasises the effectiveness of a unit's exploratory and exploitative innovation under different contextual conditions. Schilke (2014) argues that environmental aspects, such as environmental dynamism and competitiveness, play a moderating role between innovation and performance. Innovation found in organisations can be measured according to exploitative and explorative innovation as these variables are given attention by several researchers (Guan and Liu, 2016; Popadic et al., 2016).

Mintzberg's (1979) work synthesises the work on organisational structure and offers a categorisation of organisations that operate in different environments. He argues that organisations that succeed design their structures to be in line with their situation or environment. This implies that effectual structuring needs consistency in terms of design criteria and contingency factors. The key conclusion arrived at is that bureaucratic structures are efficient in stable environments but cannot innovative or cope with change.

Organisation Archetype	Key Features	Innovative Potential
Simple structure	An organic type centrally controlled by one person but can respond quickly to changes in the environment, e.g. small start-ups in high-technology	An organic type centrally controlled by one person but can respond quickly to changes in the environment, e.g. small start-ups in high-technology
Machine bureaucracy	A mechanistic organisation characterised by high level of specialisation, standardisation and centralised control. A continuous effort to routinise tasks through formalisation of worker skills and experiences	A mechanistic organisation characterised by high level of specialisation, standardisation and centralised control. A continuous effort to routinise tasks through formalisation of worker skills and experiences

Professional bureaucracy	A decentralised mechanistic form which accords a high degree of autonomy to individual professionals. Characterised by individual and functional specialisation, with a concentration of power and status in the 'authorised experts'. Universities, hospitals, law and accounting firms are typical examples	The individual experts may be highly innovative within a specialist domain, but the difficulties of coordination across functions and disciplines impose severe limits on the innovative capability of the organisation as a whole
Divisionalised form	A decentralised organic form in which quasi-autonomous entities are loosely coupled together by a central administrative structure. Typically associated with larger organisations designed to meet local environmental challenges	An ability to concentrate on developing competency in specific niches. Weaknesses include the 'centrifugal pull' away from central RandD towards local efforts, and competition between divisions which inhibit knowledge sharing
Adhocracy	A highly flexible project-based organisation designed to deal with instability and complexity. Problem-solving teams can be rapidly reconfigured in response to external changes and market demands. Typical examples are professional partnerships and software engineering firms	Capable of fast learning and unlearning; highly adaptive and innovative. However, the unstable structure is prone to short life, and may be driven over time toward the bureaucracy

Table 2-2 Mintzberg's Structural Archetypes and their Innovative Potentials
Source: Lam (2000)

2.9.4 Evaluation of Frameworks Related to Research Variables

2.9.4.1 Wanjiru & Kilika (2017) Framework

Framework Content: Wanjiru & Kilika (2017) proposed a theoretical framework that related TMT characteristics to distinctive capabilities, innovation and organisational performance, and they revealed that there is a positive relationship between distinctive capabilities, innovation and organisational performance, as clarified in Figure 3.2.

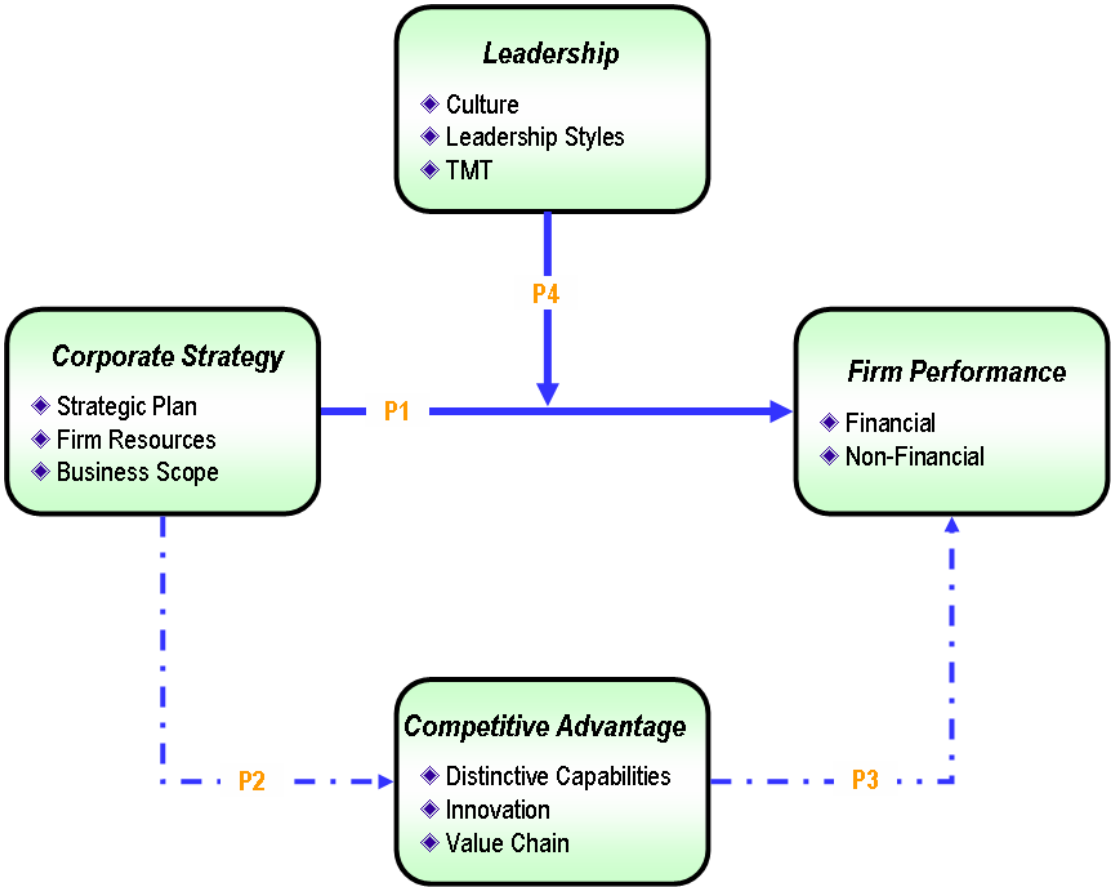

Figure 2-2 Direct and indirect effect of corporate strategy on firm performance and the mediating effect of leadership: Wanjiru and Kilika Proposed Framework (2017)
Source: Wanjiru and Kilika Proposed Framework (2017)

Evaluation: Wanjiru & Kilika's (2017) framework did not take into account the implications of dynamic capabilities; additionally, it considered innovation to mediate the variable of corporate strategy and performance; TMT characteristics were a moderating variable. This was the opposite of the finding from the literature review. The difference is that the Researcher in his current research according to the literature review that emphasised that TMT characteristics often have an independent effect on dynamic capabilities and innovation directly, and dynamic capabilities are made up of all of the TMT characteristics owned by the leaders of the organisation, which is reflected in the innovation achievement.

2.9.4.2 Rezazadeh et al. (2016) Framework

Framework Content: Rezazadeh et al. (2016) proposed a theoretical framework that related to Technology Orientation, Dynamic Capabilities and SMEs Performance, as clarified in Figure 3.3. Rezazadeh et al. (2016) revealed that of the three different types of dynamic

capabilities, learning capability most effectively mediates the impact of technology orientation on performance.

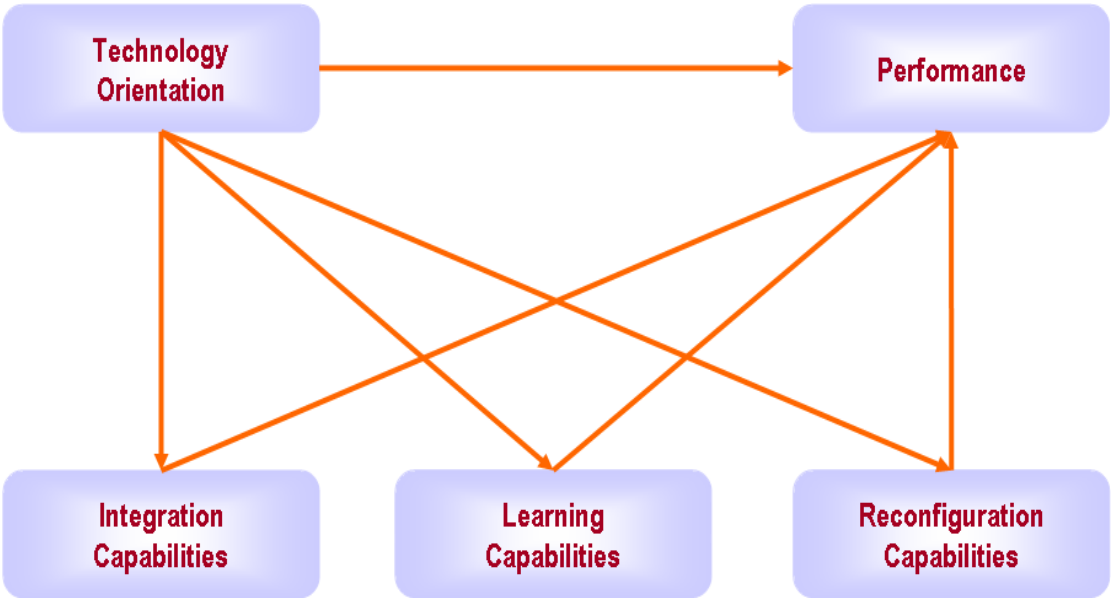

Figure 2-3 The mediating effect of dynamic capability on the effect of technology orientation and firm performance: Rezazadeh et al. Proposed Framework (2016)
Source: Rezazadeh et al. (2016) Proposed Framework

Evaluation: Rezazadeh et al.'s (2016) work falls in with the idea that technology orientation is linked to developments and changes in the field of work, that is the organisations need some time to meet the requirements of market developments in terms of the need to be more oriented to technology orientation than previously; thus technology orientation was supposed to be a moderating factor. The meaning here was that dynamic capacity was to become an independent factor and technology orientation was moderate. This differed from the current research; in the current research, the Researcher considered that the dynamic capabilities are a mediating variable influenced by TMT characteristics but affecting organisational innovation.

2.9.4.3 Yoon et al. (2016) Framework

Framework Content: Yoon et al. (2016) in their research, proposed a theoretical framework that related TMT characteristics and organisational creativity from Upper Echelons Theory, as clarified in Figure 3.4. They found that a high number of members in the TMT had a substantial and negative effect on organisational creativity. There was also a negative

association between the average age of the TMT members and organisational creativity. This contrasts with functional diversity of the TMT which had a significantly positive impact on organisational creativity. By arguing that TMT characteristics logically preceded factors that influence organisational creativity, their study improved the understanding of the relationship between TMT characteristics and organisational creativity.

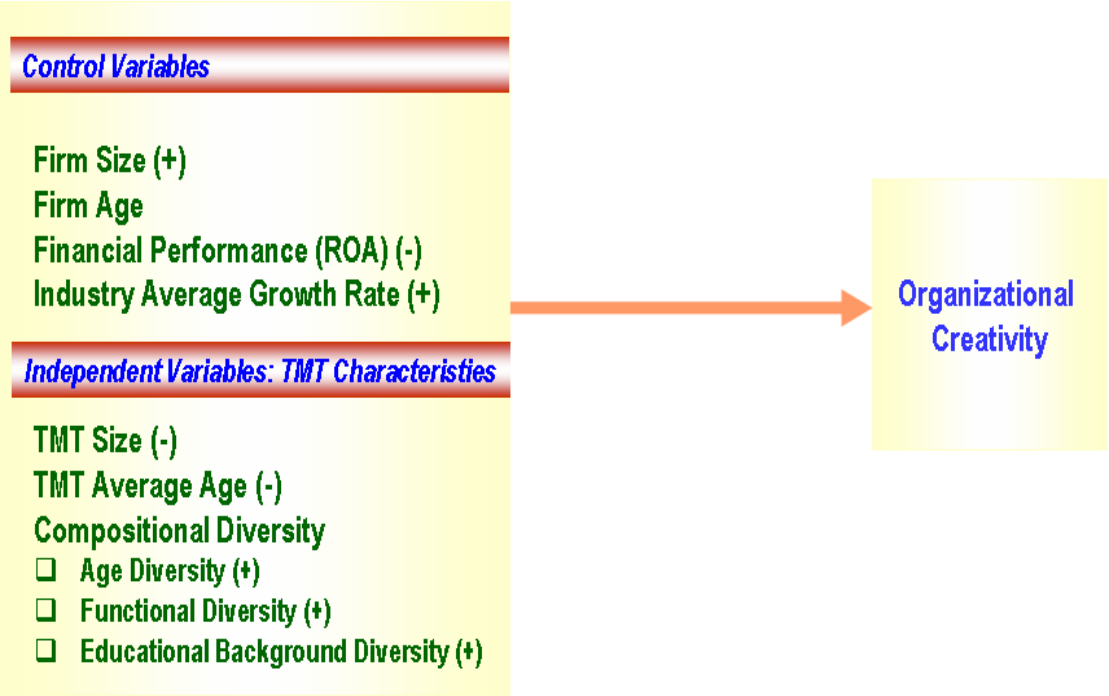

Figure 2-4 The effect of TMT on creativity: Yoon et al. Proposed Framework (2016)
Source: Yoon et al. (2016) Proposed Framework

Evaluation: Yoon et al.'s (2016) framework did not have dynamic capabilities; they also studied the effect of TMT characteristics on organisational creativity, which differed from the current study in two respects. The first difference is related to the lack of dynamic capabilities. The second is related to the adoption of organisational creativity instead of innovation. Yoon et al.'s (2016) framework did not take into account the role of dynamic capabilities in the achievement of organisational creativity, as confirmed by many studies. The difference here lies in the fact that innovation is different from organisational creativity, in addition to the fact that the dynamic capabilities are a factor in achieving innovation.

2.9.4.4 Lin & Wu (2014) Framework

Framework Content: Lin & Wu's (2014) proposed theoretical framework explores the role of dynamic capabilities in organisational performance under the resource-based view framework, as clarified in Figure 3.5. They revealed that the dynamic capabilities can mediate the organisation's valuable, rare, inimitable and non-substitutable (VRIN) resources to improve performance.

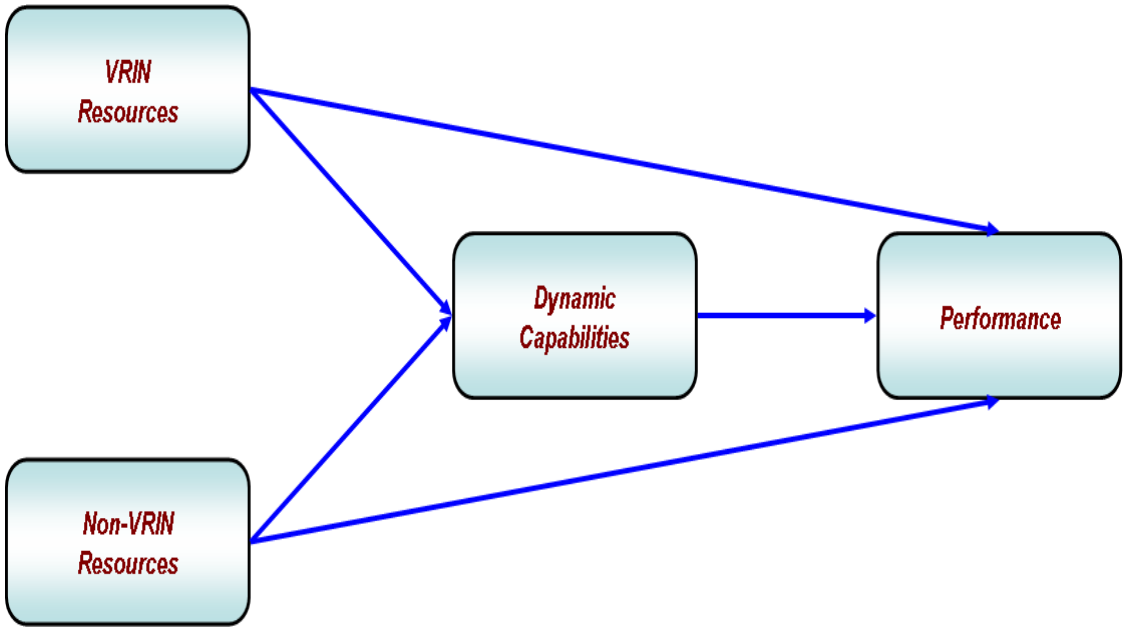

Figure 2-5 DC: Dynamic capability mediating the effect between VRIN and Non-VRIN resources and firms performance: Lin & Wu Proposed Framework (2014)
Source: Lin and Wu (2014) Proposed Framework

Evaluation: Lin & Wu's (2014) framework did not have TMT characteristics; they also studied the role of dynamic capabilities in organisational performance under the resource-based view framework, which differed with the current study in terms of two aspects. The first aspect is related to the lack of TMT characteristics. The second is related to the adoption of performance instead of innovation. Yoon et al.'s (2016) framework did not take into account the importance of TMT characteristics in achieving innovation, and the main role of dynamic capabilities in the relationship between TMT characteristics and innovation.

2.9.4.5 Kariyapperuma (2013) Framework

Framework Content: Kariyapperuma (2013) set out a theoretical framework that provides a detailed description of antecedents or determinants of dynamic service innovation; illustrates

dynamic service innovation capabilities at the TMT level which includes express identifiable factors that suggest that dynamic innovation capabilities are not unclear and abstract but in fact specific processes which can be explored further in theory and practice; and pertains to service innovation of Upper Echelons Theory as set out in Figure 3.6. The antecedents which Kariyapperuma (2013) describes are human capital intensity, internal advice seeking and external advice seeking behaviour. TMT heterogeneity, internal connectedness and external connectedness play a moderating role over the influence of these variables on dynamic service innovation capabilities.

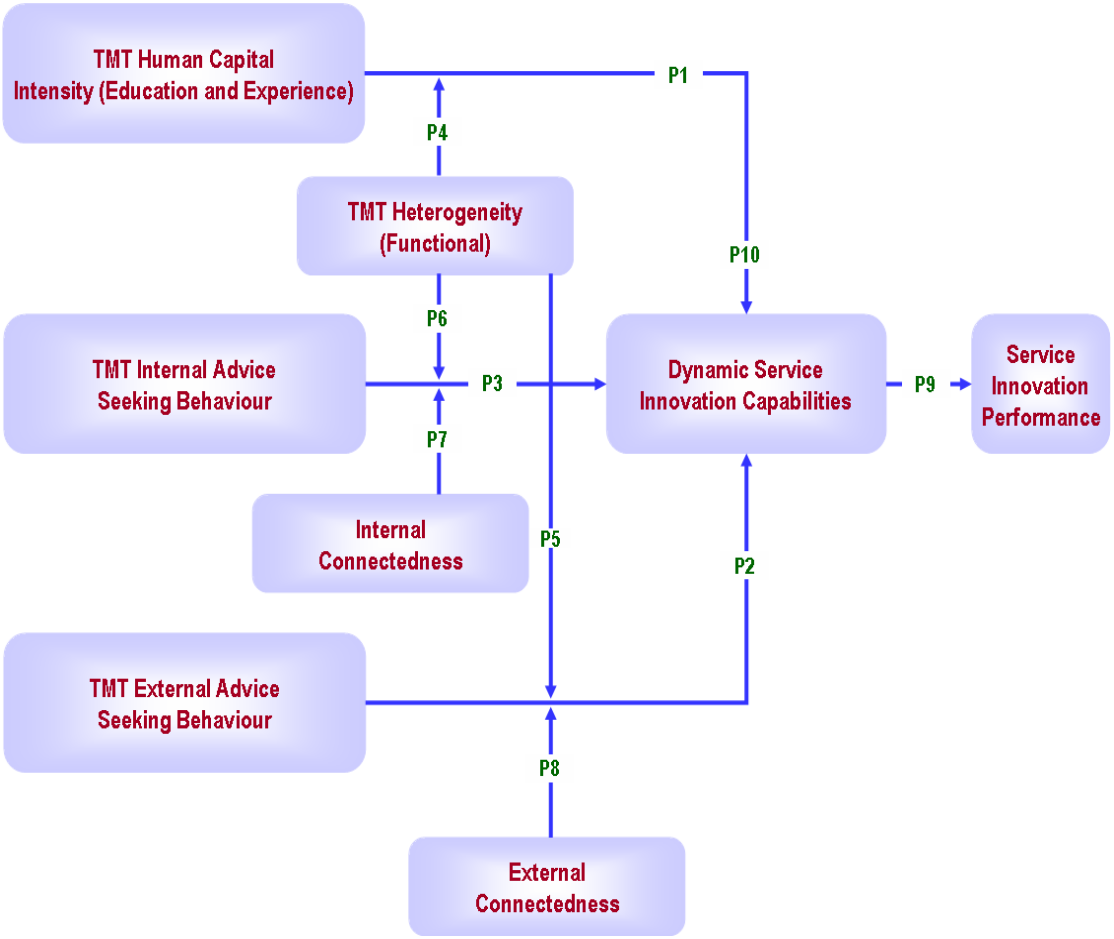

Figure 2-6 Antecedence of dynamic capability and firms performance: Kariyapperuma Proposed Framework (2013)
Source: Kariyapperuma (2013) Proposed Framework

Evaluation: Kariyapperuma's (2013) framework has a main weakness, clarified by the large and wide variety of variables and influences among them, which is reflected in the control of this multiplicity, and thus the inability to give clear perceptions of the relationship and effects

between the variables adopted; in addition to this, the model took service innovation performance in contrast to the current study considering innovation as the final outcome of the two factors, TMT characteristics on the one hand, dynamic capabilities on the other.

2.9.4.6 Camelo et al. (2010) Framework

Framework Content: Camelo et al. (2010) set out a framework with which to examine how the educational level and diversity of a organisations TMT, managed by strategic consensus, influences its innovation performance. This is set out in Figure 3.7. They demonstrated that a higher educational level across the TMT has a positive and direct effect on innovation performance. In contrast, functional diversity and tenure diversity have a direct and negative effect. However, should there exist strategic consensus within the TMT, then a positive relationship arises between functional diversity and innovation.

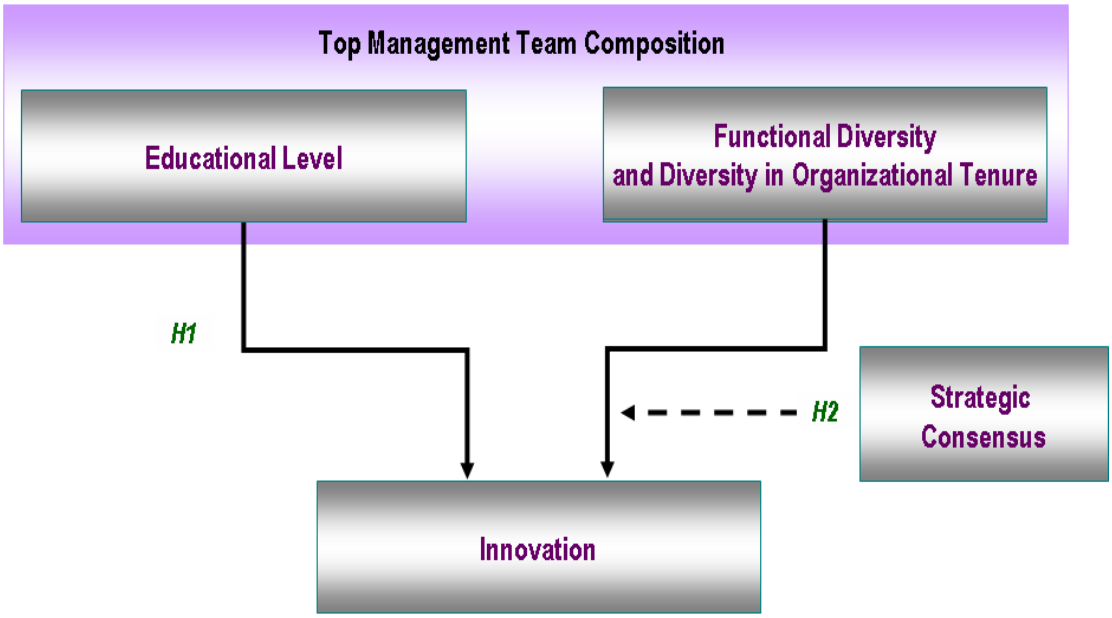

Figure 2-7 The effect of TMT on innovation: Camelo et al. Proposed Framework (2010)
Source: Camelo et al. (2010) Proposed Framework

Evaluation: Camelo et al.'s (2010) framework did not have dynamic capabilities; they also studied the effect of some TMT characteristics on innovation, which differed from the current study in terms of two aspects. The first aspect is related to the lack of dynamic capabilities. The second is related to the adoption of some TMT characteristics. Camelo et al.'s (2010) framework did not take into account the other TMT characteristics such as average age, as confirmed by many studies.

2.10 Gaps in the Literature

The gaps in the literature are:

-Although there are calls for improvements in the performance of firms in the construction industry in Saudi Arabia, there is no clear evidence of research into understanding how TMTs of firms can contribute in this regard, namely by using their capabilities to create innovative solutions to problems.

- The influence of DCs and how they could lead to improvements in the construction industry is not widely researched. Eisenhardt and Martin (2000) mention in their theoretical discussion that DCs of successful companies have certain commonalities which can therefore be identified as best practices.

- It is clear from a review of the content of the fieldwork on DCs that there is a lack of research on multidimensional constructs of DCs; most of the research employs simple proxies or constructs with which to investigate firms in general (e.g. Boccardelli and Magnusson, 2006; Sawyers, Pretorius, Oerlemans, 2007; Wu, 2006; Rindova and Kotha, 2001; Athreye, 2005). Such approaches do not fully represent the complexities of DCs (Wang and Ahmed, 2007). In other words, they fail to examine real world phenomena from a DC perspective.

- This discussion leads to the conclusion that the antecedents to DCs require more intense analysis since there is a clear gap in the DC literature. Although some scholars have identified a unique source of DC determinants and the individual level of analysis is well developed, there is a gap at the organisational and social levels within which these capabilities operate. However, many researchers such as Hawass (2010), Teece (2007), Zollo and Winter (2002), Eisenhardt and Martin (2000), and Rothaermel and Hess (2007) agree that the antecedents to DCs make it necessary to develop a theoretical support to understand the relationship.

- The relation between TMT characteristics and DCs remains unclear (Proeller et al., 2011). Andrews et al. (2009) found that a rational planning approach alone, i.e., just having a formal planning process in place, does not necessarily produce positive performance and innovation. TMT characteristics are also likely to improve innovation through the use of more developed DCs (Proeller and Siegel, 2010). Moreover, a number of researchers (Yuan et al., 2014; Mihalache et al., 2012; Heyden et al., 2013; Yang and

Wang 2014) have given attention to the relationship between top level managers and the degree of innovation in their organisation, and stated that it is important to examine this relationship in a different context.

- An analysis of different variables inside DCs and organisational innovation relations shows that many misunderstandings have arisen because of an incomplete theory of DCs. It is one of the key aims of this research to examine the relationship between DCs and innovation.

- DC as a mediating factor has not yet been fully investigated and this has restricted our understanding of the important role of this mediator in explaining the connection between TMT and organisational innovation (Hsu et al., 2008; Penrose and Pitelis, 2009). This has motivated the Researcher to study the mediating role of DCs and to consider the challenges in practice because of the absence of fieldwork to support this issue.

- It is also understood that DCs on their own do not directly lead to sustainable competitive advantage (Cepeda and Vera, 2007; Eisenhardt and Martin, 2000; Weerawardena and Mavondo, 2011). This makes it necessary to fully examine and understand the process by which DCs are generated, evolve and die (Eisenhardt and Martin, 2000). Finally, a stronger argument needs to be made for the influence of DCs at both a process and firm level on innovation (Drnevich and Kriauciunas, 2011). Stronger practical support for this is necessary in the literature. Table 2.2 gives a summary of the identified knowledge gap from the literature review.

Area	Research Author / Year	Gap
Top Management Teams ↔ Performance	Guo et al. (2018)	Investigate the TMT diversity in shaping the performance of business model innovation only, and not taking into consideration the characteristics of other TMT characteristics
	Tanikawa et al. (2017)	Investigate the TMT age diversity on firms' financial performance only, and not taking into consideration the characteristics of other TMT characteristics and operational performance
	Tulung & Ramdani (2016)	Investigate the relation between TMT composition and BPD performance; do not investigate operational performance
	Li et al. (2015)	Investigate the nonlinear relationship between TMT heterogeneity in education level and educational background and corporate performance, and do not take into consideration other TMT characteristics
TMT ↔ Dynamic Capabilities	Ruiz-Jiménez and Fuentes-Fuentes (2016)	Investigate the role of gender diversity in TMTs in terms of the relationship between management capabilities and innovation performance of technology-based SMEs

	Maghzi et al. (2015)	Improve understanding of how firms deploy dynamic capabilities by identifying that we need to first understand the specific decision-making approaches (rational reasoning vs. heuristics) that TMTs apply and how environmental conditions (highly vs. moderately dynamic) interact with such decision-making.
	Proeller et al. (2011)	Relation of TMT characteristics and dynamic capabilities is still unclear
	Proeller and Siegel (2010)	TMT characteristics might be using more developed dynamic capabilities, resulting in better innovation
	Andrews et al. (2009)	Sole rational planning approach, that is, simply having a formal planning process implemented, does not result in performance and innovation effects
TMT ↔ Organisational Innovation	Lee et al. (2017)	Investigate the relationship between characteristics of the firm's TMT and its research and development (R&D) activities. Specifically, this research analyses how observable characteristics of the TMT, such as functional experiences or educational background, and average tenure affect the firm's proportion of explorative R&D activities.
	Sperber1 & Linder (2016)	Firm innovativeness reflects the fit of the TMT to its tasks and that, therefore, diverse strategic paths can lead to the same output of innovative performance.
	Yuan et al. (2014)	Pay attention to the relationship between top level managers and their organisation's innovativeness
	Yang and Wang (2014)	
	Heyden et al. (2013)	The importance of investigating the relationship between top level managers and their organisation's innovativeness in different contexts
	Mihalache et al. (2012)	

Area	Research Author / Year	Gap
Dynamic Capabilities ↔ Organisational Innovation	Jimenez-Jimenez and Sanz-Valle (2011)	Innovations are conceptualised as the adapter of new ideas, results or changed behaviour
	Danneels (2010)	Process innovation can be enhanced by organisation's ability to combine and integrate individual internal inputs into a new collective logic of interaction through integrating and coordinating capabilities
	Agarwal and Selen (2009)	Dynamic capabilities are of vital importance in service organisations, as they provide a systematic and proactive way to explore new opportunities and anticipate threats from competitors
	Protogerou et al. (2008)	Important to examine such relations as dynamic capabilities are recognised as having insignificant direct impact on organisation's performance results
	Verona and Rabasi (2003)	To maintain sustained levels of innovation, organisations must develop dynamic capabilities that allow the simultaneous and continuous creation, absorption and integration of knowledge
Dynamic Capabilities ↔ Performance	Nyachanchu, et al., (2017)	Examine the influence of the three dimensions of dynamic capabilities (sensing capabilities, seizing capabilities and reconfiguration capabilities) on firm performance do not investigate operational performance
	Ringov (2017)	Investigates the relationship between codified dynamic capabilities and firm performance at different levels of environmental dynamism, and does not take into consideration the other environmental factors
	Soumodip et al.	Analyse the relationship between market, entrepreneurial

	(2017)	and learning orientations, dynamic capabilities, and performance using an integrative approach hitherto little explored, not taking into consideration that dynamic capabilities mediate variables
	Fainshmidt et al. (2016)	Evaluate the two core theoretical tenets of the DCV: (1) dynamic capabilities are positively related to performance, and (2) this relationship is stronger in industries with higher levels of technological dynamism, not taking into consideration the other technological factors
	Osisioma & Nzewi (2016)	Examine the relationship between sensing capability only and the performance of selected commercial banks in Awka
	Kihara et al. (2016)	Determine the influence of dynamic capabilities on performance of large manufacturing firms in Kenya, focused on large manufacturing firms.
Organisational Innovation ↔ Performance	Rajapathirana & Hui (2017)	Investigate the relationship between innovation capability, innovation type, and firm performance, focused on insurance companies
	Suhag et al. (2017)	Investigate the relationship of innovation with organisational performance of the telecommunication sector, focused on telecommunication sector and employees
	Gomes & Wojahn (2017)	Consider innovation as a mediating variable, not taking into consideration the contingency factors for innovation
	Valmohammadi (2017)	Considers innovation as a mediating variable, focused on Iranian manufacturing firms only
	Prifti & Alimehmeti (2017)	Investigate the market orientation relation with innovation and firm performance; do not investigate operational performance
	Moreira et al. (2017)	Analyse the influence of the performance of healthcare organisations; inconclusive about the idea that innovation in healthcare units has an overall impact on their financial performance
Mediating Effect of Dynamic Capabilities	Hsu et al. (2008) Penrose and Pitelis (2009)	Consider the limited understanding the role of dynamic capability in explaining the relationship between top managers and organisational innovation; in addition, consider that there are some difficulties in practice due to the lack of empirical work in support of this issue

Table 2-2 Research Literature Gap
Source: The Researcher

2.11 Chapter Conclusion

It is clear that DCs are intricate phenomena. The impact that DCs have on organisation performance cannot be over-emphasised. In terms of TMTs, this chapter claims that DCs have a part to play in the extent to which the TMT influences organisation performance. This may take the form of the ability of the organisation to comprehend and interpret market opportunities and threats. The continually changing nature of markets in which organisations function make innovative solutions crucial to their success. This is also the case for innovation. As stated in this chapter, in order for firms to remain competitive and survive market conditions, there is a need for innovation. This can take the form of exploitative

(which seeks to improve existing products and services to maximise the economic advantage of an existing opportunity) or exploitative innovation (which is long-term oriented and involves experimenting and developing more profound innovation). This chapter argues that TMT characteristics and DCs may assist organisations in their process of innovation. In this chapter, further discussion is also provided regarding the main theories over the related area such as the Upper Echelons Theory, Dynamic Capabilities and Resource Based View Theory, and Contingency Theory to Organisational Innovation.

Another aspect of this chapter was the critical review of the literature on TMT and pinpointing the characteristics of TMT that are most likely to impact the performance of organisations. As one part of the critical review task in this chapter, this research has considered how DCs mediate the TMT and organisational innovation relationship, and how to coordinate organisational innovation. In relation to the example of construction companies in Saudi Arabia, there is a clear need to improve performance in the construction industry generally. It is argued that TMTs will play a crucial role in developing innovative solutions to problems. This ties in with the need to investigate the relationship between TMT, DCs, innovation and performance generally.

In the next chapter, a number of theories will be considered in order to create a framework and explain the relationship between the variables in order to formulate hypotheses for this research.

3 Theoretical Framework

3.1 Overview of the Chapter

The literature review of the previous chapter identified gaps in the literature on the impact of TMT characteristics and organisational performance. Where the previous chapter explained in detail the main elements in this research – TMT characteristics, DCs, organisational innovation and performance. In the line with what has been discussed in the prior chapter regarding the main theories over the related area, further justifications are also added why these theories are applicable to this research with a view to explaining the process of the proposed model and the sub-variables of each variable. The chapter is divided into a review of the theories on TMT characteristics, and the relationship between TMT and the performance and development of the proposed framework.

3.2 Theories Adopted in the Current research

As mentioned above, this research will build a model using contingency theory and Hambrick and Mason's (1984) Upper Echelons Theory of strategy in order to answer the research questions posed. The model includes DCs in a mediating role and integrates it with RBV theory which views resources as part of their capabilities.. There are two reasons why most research on TMTs has focused on this area: this was the focus of Hambrick and Mason's (1984) initial proposals; and the data are easily available. Demographic information will also be a large part of this research although the heterogeneity/homogeneity issue will not receive special attention. According to Upper Echelons Theory Role interdependence and size represent important aspects of the structure component of top management interaction. When there is an interdependence of roles among top management, there is a greater need for resource sharing and cooperation between individuals. However, this does not necessarily mean consensus or cohesion among the individuals concerned (Finkelstein and Hambrick, 1996). Team size may also be significant in that smaller teams which tend to interact more may display greater cohesion as fewer "coalitions" may emerge. Interaction occurs between both the structure and composition of the TMT and this serves to determine the process through which they make decisions as a unit. This aspect of TMT interaction includes social integration and consensus. As stated in Chapter 1, few studies have investigated the process

that takes place between TMT demography and organisational outcomes (Smith et al., 1994). More commonly, researchers have pursued social-psychological explanations for the link between them (Hambrick and D 'Aveni, 1992; Michel and Hambrick, 1992; Murray, 1989). Such studies have claimed that team demographic characteristics have an influence on such aspects as communication and social integration of the organisation, which then impact on organisational outcomes. The group's heterogeneity will have an impact on the extent of social integration, which in turn will produce cohesion and consensus.

The core of Upper Echelons Theory is that demographic characteristics can be used to explain psychological attributes and this then explains how TMTs interact and function. In practical terms, this mean that the heterogeneity of the team in terms of education, age, background, etc. might explain the willingness or otherwise of team members to interact with other team members, and that this then increases or reduces social integration and as a corollary, the quality of decision-making.

This research will also use Dynamic Capabilities and Resource Based View Theory for identifying a set of appropriate DCs. The starting point for this is the four set out in Teece et al. (1997) (reconfiguring, learning, integrating and coordinating) as well as sensing the environment to seize opportunities and reconfigure assets mentioned in his later work (1997). In relation to this research, DCs are considered tools that help to reconfigure existing operational capabilities. This is different to RBV because although it can explain how an organisation can utilise its intangible resources to create and implement valuable strategy from which increased performance can emerge, it does not explain the reason for some organisations performing better than others in a fast-paced environment. The end goal of DCs is maintaining fitness for purpose despite changing times and the avoidance of rigidities by reconfiguring operational capabilities and creating new ones (Teece, 2007). Reconfiguration can be described as appropriateness (Carlos, 2011), timeliness (Zott, 2003), and efficiency (Nieves and Haller, 2014) of reconfiguration.Contingency Theory to Organisational Innovation points to an understanding of how an organisation's activities relate to technological environments, structure and performance. The opposing typologies posited by Burns and Stalker (1961) of "mechanistic" and "organic" organisations shows the degree to which organisational structures and innovation management are affected by differences in technology and complexity of the market environment. Their research groups organisations into two main types: a rigid and hierarchical one better suited to stable conditions; and a fluid one that adapts to conditions of rapid change and innovation. They argue that none of these types is wrong but rather they appear according to the environment within which the organisation operates. For their part, Lawrence and Lorsch (1967) argue that technical-economic and scientific sub-environments of markets of different industries have a crucial impact on an organisation's development. What emerges from this is that Burns and Stalker (1961) see an organisation as just one thing, either mechanistic or organic in nature, whereas Lawrence and Lorsch (1967) perceive such opposing structures to coexist within the same organisation because of the different requirements of sub-environments. These arguments have had a significant impact on the development of theory in this area and provide useful design guidelines for innovation management.

3.3 Synthesis of the Research Variables Theories

Mason and Fredrickson (2001) state that Upper Echelons Theory can only be said to hold true if we accept that TMTs normally operate in conditions of great uncertainty. Further to this theory, it can be stated that the more uncertain the decision-making situation, the more likely TMT demographic characteristics will impact on organisational outcomes. Due to the difficulty in measuring these features of executives, research has suggested that managerial characteristics can take their place to determine the effects of cognitions on organisational innovation (Carpenter, 2004; Hambrick, 2008). These can take the form of age, functional background and educational experiences.

The construction industry has a highly-complicated nature and suffers from great uncertainty, not least because of the one-off nature of its projects and the multitude of organisations that work on them. TMTs in this industry will therefore be continually tasked with difficult decision-making to keep the project afloat and meet the needs of the client.

As argued by Yunlu and Murphy (2012), because these psychological constructs cannot be avoided, those constructs that can be observed act as proxies and give reliable indications of the forms of the unobservable ones. For a construction company, this will need the TMT to adopt strategic decision-making and will act as the basis for all its policies and practices across all its projects. Hambrick and Mason (1984) also argue that strategic outcomes indicate the impact of demography on cognitive processes. Their model predicts that resultant organisational outcome as innovation and performance, which influence the profitability of the organisation as well as the basis for survival of the organisation.

The specific research questions that the Researcher seeks to answer in this research are: To what extent do TMT characteristics affect organisational innovation? To what extent do TMT characteristics affect DCs? To what extent do DCs affect organisational innovation? To what extent do TMT characteristics affect organisational innovation via DCs? For the construction industry specifically, the question is: To what extent do TMT characteristics influence innovation in the delivery of projects (through innovative processes and technologies)? The research will also consider how TMT characteristics affect the DCs of construction companies and how these in turn translate into innovative practices. The last issue is to try to

identify how TMT innovativeness translates into improved performance of the construction company.

The Researcher also intends to address the lack of fieldwork that explains TMT characteristics. Furthermore, over the last 30 years, the TMT literature and its effect on organisational innovation has not reliably predicted the influence of TMT characteristics on organisational innovation (Hsu et al., 2008), and there is still little in the literature that explains the relation between top managers and innovation in organisations (Talke et al., 2011). It is hoped this research will draw some conclusions on this.

3.4 Formulation for the Proposed Theoretical Framework

3.4.1 Based on the outcome of the literature review and the review of theories related to TMT characteristics and organisational innovation, this section formulates hypotheses that form the basis for the development of a theoretical framework for investigating TMT and organisational innovation in small- and medium-sized construction organisations in Saudi Arabia.**Proposed Research Framework**

From the discussion above, it is apparent that the different theories on TMT characteristics all make contributions to the development of the subject area. For this reason, a conceptual framework is developed and evaluated in this research in terms of the different variables that impact on TMT characteristics and organisational innovation and performance and the mediating role played by dynamic capabilities.

TMT characteristics, dynamic capabilities, organisational innovation and performance discussed in Chapter 2 of this research represent a need to consider alignment between TMT characteristics, dynamic capabilities and organisational innovation to lead to high performance. The literature gap discussed in Chapter 2 highlights key shortcomings in alignment between TMT characteristics, dynamic capabilities, organisational innovation and performance (see Table 2.2 in Section 2.8 in Chapter 2). Based on the review in this chapter and the previous chapter, the proposed framework for the current research investigates the mediating effect of dynamic capabilities on the relationship between TMT characteristics, organisational innovation and performance, with dynamic capability added as a mediator

which is integrated with RBV theory, as well as the relationship between TMT characteristics, organisational innovation and performance, as the following Figure (3.9) illustrates:

From the previous review of the other frameworks, the Researcher can summarise the gap as follows:

- The study of dynamic capabilities is not a mediating variable, and dynamic capabilities are not considered as a driving factor in achieving innovation.
- Most of the frameworks considered the TMT characteristics as a moderating variable, which is opposite to the literature review.
- The lack of the studies that studies the dynamic capabilities are mediate variable influenced by TMT characteristics but affect organisational innovation and performance.
- The current research considers the dynamic capabilities as the driving factor in achieving innovation, which is not taken into consideration by previous studies.
- There is an importance of TMT characteristics in achieving innovation, and the main role of dynamic capabilities in the relationship between TMT characteristics innovation and performance.
- The TMT characteristics in the current research are adapted based on the sample of researchers' points of view.
- The current research according to the literature review emphasised that the TMT characteristics are often independent in terms of their affect the dynamic capabilities, innovation and performance directly, and the dynamic capabilities relate to all the TMT characteristics owned by the leaders of the organisation, which is reflected in the innovation and performance achievement.

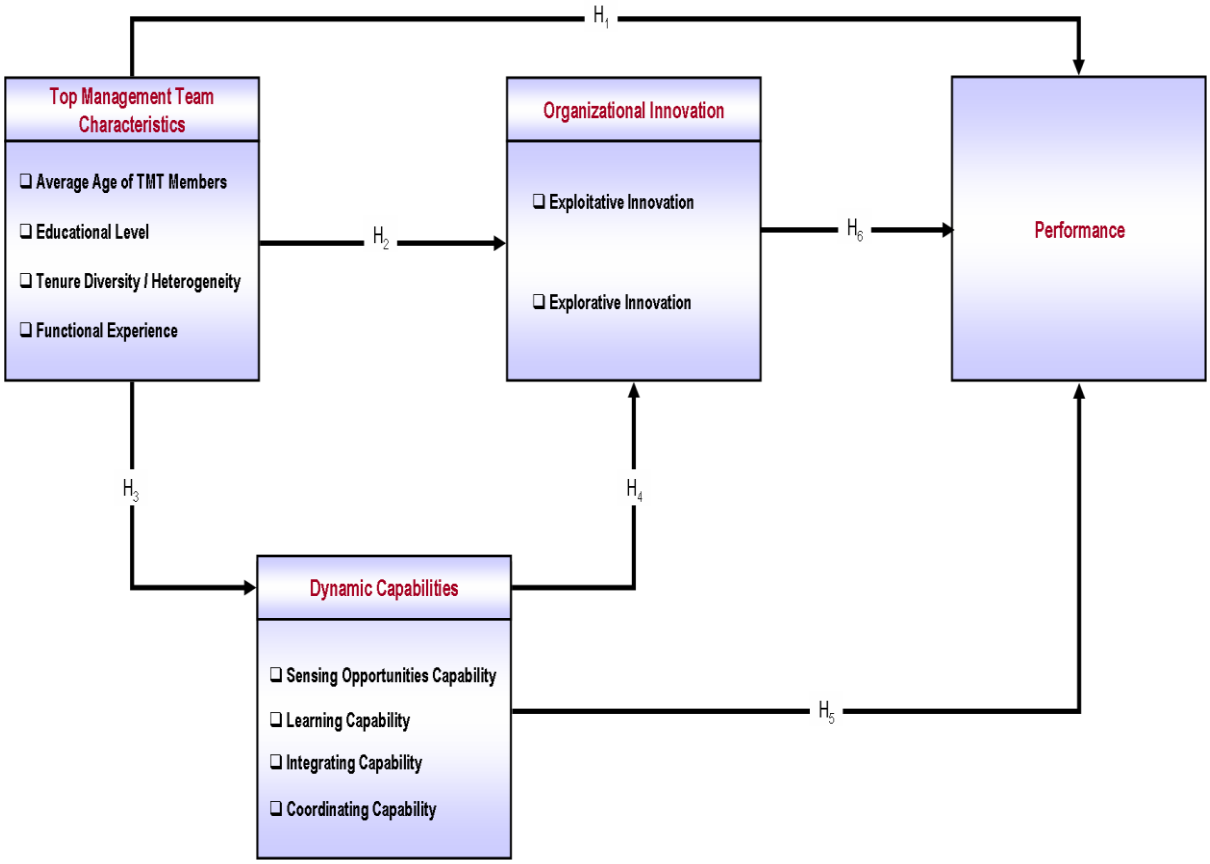

Figure 3-1 Proposed Research Framework
Source: The Researcher

Figure 3.9 illustrates the Proposed Research Framework that consists of a set of variables, giving a preliminary view of a set of correlations and effect between the research variables, which will be quantitative. In the light of the intellectual ideas, theorists and researchers on the importance of TMT characteristics, dynamic capabilities in achieving organisational innovation and performance. The limited studies that incorporate the datum of these variables, interaction in a single framework.

The Proposed Research Framework aims to contribute to the stream of literature on TMT characteristics; dynamic capabilities; organisational innovation and performance through investigation of the mediating effect of dynamic capabilities on the relationship between TMT characteristics, organisational innovation and performance.

The Researcher evaluates his Proposed Research Framework based on four phases, as mentioned in Chapter 3. Table 3.2.

First Phase: Inputs

TMT Characteristics as an independent variable and input to the Proposed Research Framework has a positive direct effect on other research variables (dynamic capabilities, organisational innovation and performance) based on Upper Echelons Theory to analyse the relationship between TMT Characteristics, dynamic capabilities, organisational innovation and performance.

Second Phase: Process

Dynamic capabilities as a mediating variable it affects by TMT Characteristics directly, influences on organisational innovation and performance directly, plays a mediating role in the relationship between TMT Characteristics and organisational innovation, additionally, it plays a mediating role in the relationship between Management Teams' Characteristics and performance. Based on RBV theory, the emphasis of DCs is on resource renewal. In other words, it is on reconfiguring resources into new combinations of operational capabilities. Given that managers are regularly called upon to make decisions on the renewal of existing operational capabilities that are a better fit for a changed environment, DCs represent a substantial test for managers in their efforts to secure a sustainable competitive edge.

Third Phase: Outputs

Organisational innovation (exploitative innovation and exploratory innovation) is a dependent variable directly and positively influenced by TMT characteristics and DCs. It also has a positive and direct effect on performance based on contingency theory that supposes a highly organic and flexible form of organisation that is capable of radical innovation in an unstable environment.

Fourth Phase: Outcomes

Performance as an outcome of the Proposed Research Framework is directly and indirectly affected by TMT Characteristics, dynamic capabilities and organisational innovation.

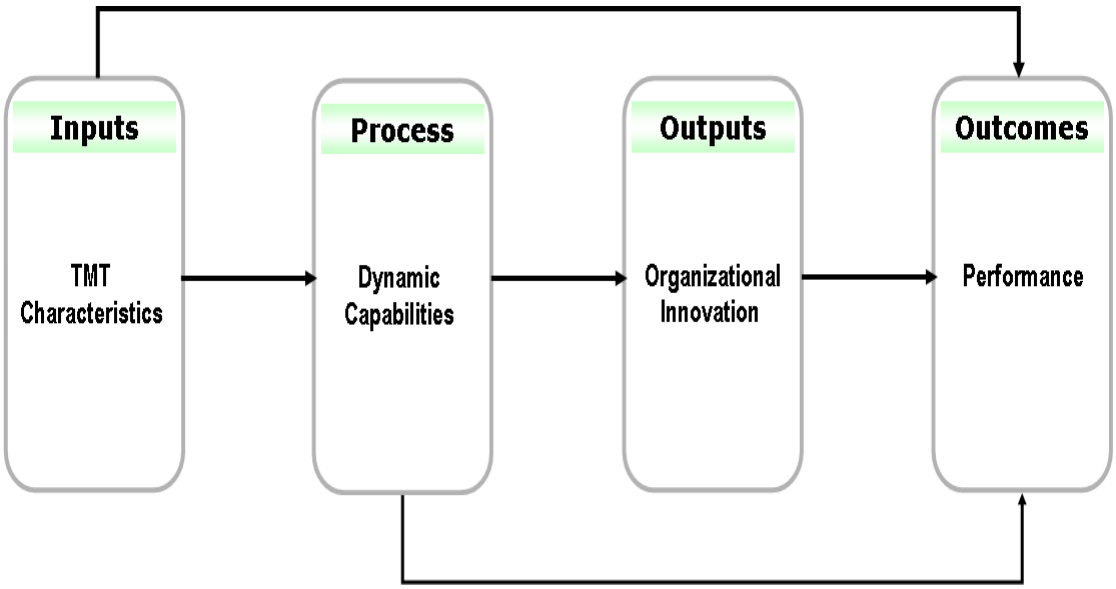

Figure 3-2 Proposed Research Framework Evaluated
Source: The Researcher

The proposed framework can be translated into the idea that the characteristics of TMT in construction organisations will determine their dynamic capabilities which in turn will determine or influence the organisational innovation of the organisation which will lead to increased performance of the organisation.

3.4.1.1 TMT Characteristics and Performance

The first hypothesis relates to the relationship between TMT characteristics and performance. In fact, TMT Characteristics (Average Age of TMT Members, Educational Level, Tenure Diversity / Heterogeneity and Functional Experience) could play a vital role in predicting the level of organizational performance (i.e.). This could be attributed to the fact that TMT characteristics will considerably reflect on the quality decisions taken, which in turn, on the overall outcomes for the organization. As well as, over the prior literature, it has been widely discussed that the level of collaboration and coordination between TMT Members is affected by their own characteristics, and therefore, the contactual efficiency among them. In this regard, A number of studies have found positive effects of demographic heterogeneity, such as increased innovation by Bantel and Jackson (1989), openness to change by Virany et al. (1992), and a greater volume of information sources by Jackson (1992) and Wiersema and Bantel (2010). For example, Guo, Pang & Li (2018) investigate the role of TMT diversity in shaping the performance of business model innovation. Their study was based on a sample of 906 observations of small- and medium-sized enterprises between 2009 and 2011 from the China Startups Stock Market. They found that diversity in TMTs has a substantial threshold effect on the relationship between organisational performance and business model innovation. In particular, when TMT functional diversity reaches a specific level, the positive aspects of the relationship between a novelty-centred business model and organisational performance increase. At the same time, in relation to TMT tenure diversity, the positive relationship between an efficiency-centred business model innovation and organisational performance will increase when diversity reaches a certain level.

Tanikawa, Kim & Jung (2017) also demonstrate that TMT age diversity has a substantial negative effect on return on equity. This suggests that the negative relationship between TMT age diversity and organisational performance is weakened when the TMT members are older. Tulung & Ramdani (2016), using Upper Echelons Theory, investigated the relationship between TMT composition and the performance of an Indonesian bank, BPD. They demonstrated that age, educational level, gender and functional background characteristics had significant influences on the bank's performance. By integrating Upper Echelons Theory and RBV, Díaz-Fernández, González-Rodríguez & Simonetti (2015) studied not only the overall effect of human capital diversity in TMTs but also the moderating effect of corporate strategy on performance. They showed that there is a relation between TMT diversity,

corporate strategy, human capital and performance. Using a panel smooth transition regression (PSTR) model, Li, Zhang & Zhang (2015) studied the non-linear relationship between TMT heterogeneity and corporate performance. For his part, Awino (2013) investigated the relationship between TMT diversity, quality decisions and organisation performance, and found that the two moderating variables had a significant effect on the relationship between TMT diversity and quality decisions and TMT diversity and organisation performance. All things considered, it could be anticipated that organizational performance is more likely to be contributed by the role of TMT characteristics and performance. Therefore, , it is hypothesised that:

H1: Top Management Team Characteristics (Average Age of TMT Members, Educational Level, Tenure Diversity / Heterogeneity and Functional Experience) will have a direct positive effect on performance.

H1-1: Average Age of TMT Members will have a direct positive effect on performance

H1-2: Educational Level will have a direct positive effect on exploitative innovation

H1-3: Tenure Diversity / Heterogeneity will have a direct positive effect on exploitative innovation

H1-4: Functional Experience will have a direct positive effect on exploitative innovation

3.4.1.2 TMT Characteristics *and Organisational Innovation*

The second hypothesis in this research is the relationship between TMT characteristics and organisational innovation. The main characteristics of the TMT largely shape organizations' ability to provide innovative solutions to their actual problems or developing their strategy to be more competitive. For example, within the business environment, it is very noticeable that there is a relationship between the level of enthusiasm and passion in the strategic vision and direction of an organisation, and the extent to which it offers creative solutions and the age of TMT. This has been largely approved over prior studies that have discussed the impact of age (i.e. Camelo-Ordaz et al., 2005; Hsu et al., 2008; Colombelli, 2014; Liu et al., 2014; Yang and Wang, 2014; Kraiczy et al., 2015). On the other hand very few studies that have disapproved significant effect age as a team characteristic on organisational innovation (Yoon et al., 2016).

Moreover, the level of knowledge, skills, awareness, and wisdom will be also reflected by the educational of TMT. This, in turn, predicts the organizations' ability to design their own strategy and vision in more innovative and competitive manner. In the line with this thought, a number of studies (i.e. Rajan and Zingales, 2001; Kaplan et al., 2009; Colombelli, 2014) stated that TMT level of education will significantly influence the innovation in organisations. However, other researchers (Yang and Wang, 2014; Yoon et al., 2016) reported that the innovativeness in an organisation is insignificantly affected by the educational level of the TMT.

The third characteristic of TMT is functional experience, which relates to the diversity of experiences that TMT members have. Such kind of diversity could also enrich the decision making process as well as will help to have more comprehensive view of the organization strategy, and accordingly, having more promising vision. This will surely contribute to the level of organization innovation. Over the prior literature, there is a good number of studies (i.e. Yang and Wang, 2014; Bany-Ariffin et al., 2014; Liu et al., 2014) that have supported that the more the team has a variety of experiences, the higher innovativeness is in organisations. In contrast, other researchers have illuminated that more diversity among TMT members does not affect innovation due to the conflict of TMT experiences (Yoon and Wang, 2014; Colombelli, 2014).

The final characteristic that is investigated in this research is tenure diversity. TMT members are more likely to be able effectively apply the relevant knowledge and experience if they have a common experience. It can be reasoned that the longer the shared experience, the better they understand the place where the distributed knowledge is located (Austin, 2003), as well as the longer they have all had to decide on the trustworthiness and expertise of the advisers within the group of TMT members (Arendt et al., 2005). Following this, it can be stated that shared experience gives TMT members the ability to build up mutual understanding and find similarities within differences. This, in turn, will directly reflect on the organizational innovation as demonstrated by a number of studies over the related area (i.e. Buy et al., 2011; Liu et al., 2014; Li, 2014; Qian et al., 2014) Yet, other studies explained that the influence of tenure diversity on innovation in organisations is insignificant (Simsek et al., 2005; Cannella et al., 2008).

According to past studies, the conceptual relationship between TMT characteristics and organisational innovation is positive. In this research, it is therefore hypothesised that:

H2: Top Management Team Characteristics (Average Age of TMT Members, Educational Level, Tenure Diversity / Heterogeneity and Functional Experience) will have a direct positive effect on Organisational Innovation.

H2-1: Top Management Team Characteristics (Average Age of TMT Members, Educational Level, Tenure Diversity / Heterogeneity and Functional Experience) will have a direct positive effect on exploitative innovation

H2-2: Top Management Team Characteristics (Average Age of TMT Members, Educational Level, Tenure Diversity / Heterogeneity and Functional Experience) will have a direct positive effect on explorative innovation

3.4.1.3 TMT Characteristics and Dynamic Capability

The second hypothesis is the linkage between TMT Characteristics and Dynamic Capability. According to Upper Echelons Theory, Dynamic Capability is more related to the organization ability to predict and respond to opportunities or requirements for change, both internal and external (Wiersema and Bantel, 1992). This is more related to management capability development and hard-to-copy combinations of technological, functional, and organisational skills to obtain and maintain competitive advantages (Teece et al., 1997). The TMT has a primary role in the process. DCs need TMT characteristics to evolve a total organisational coherence while recognising the specific characteristics of the external and internal environments. This assist with strategy customisation, whilst focusing on the adaptation, integration and reconfiguration of relational and internal resources to achieve opportunities in the local and global marketplace (Dierickx and Cool, 1989; Teece et al., 1997). TMT decisions about the direction and use of strategic key resources are frequently the things which create organisational value. Therefore, DCs can be called organisational and strategic routines by which an organisation achieves newer resource reconfiguration as markets emerge, collide, split, evolve and die (Eisenhardt and Martin, 2000). Therefore, In the absence of TMT characteristics that can create effective strategic leadership, the chances are greatly reduced that the organisation can meet the challenges found in the global economy (Davids, 1995). DCs are the antecedent organisational and strategic routines with which the

TMT changes its resource base by taking on and doing away with resources, and bringing them together to create new value-creating strategies (Grant, 1996; Pisano, 1994). There are many previous studies which have been conducted into the relationship between TMT Characteristics and Dynamic Capability (Cabrera and Cabrera, 2003; Helfat and Martin, 2014; Lohmann and Muehlen, 2015; Maghzi et al., 2015). Nonetheless, there is inconsistency in the results revealed in previous studies; some of the previous studies found a significant relationship between TMT characteristics and dynamic capability (Herrmann and Datta, 2005; Fernández-Mesa et al., 2013; Leiblein et al., 2016), while a few studies found that there is an insignificant relationship (Lubatkin et al., 2006; Tecee, 2016; Lin et al., 2016).

Furthermore, this research includes TMT characteristics as an important predictor for dynamic capability. Referring to past studies, the conceptual relationship between TMT characteristics and dynamic capability is significant. Given that, the Researcher hypothesises that:

H3: Top Management Team Characteristics (Average Age of TMT Members, Educational Level, Tenure Diversity / Heterogeneity and Functional Experience) will have a direct positive effect on Dynamic Capability

H3-1: Top Management Team Characteristics (Average Age of TMT Members, Educational Level, Tenure Diversity / Heterogeneity and Functional Experience) will have a direct positive effect on Sensing Opportunities Capability

H3-2: Top Management Team Characteristics (Average Age of TMT Members, Educational Level, Tenure Diversity / Heterogeneity and Functional Experience) will have a direct positive effect on Learning Capability

H3-3: Top Management Team Characteristics (Average Age of TMT Members, Educational Level, Tenure Diversity / Heterogeneity and Functional Experience) will have a direct positive effect on Integrating Capability

H3-4: Top Management Team Characteristics (Average Age of TMT Members, Educational Level, Tenure Diversity / Heterogeneity and Functional Experience) will have a direct positive effect on Coordinating Capability

3.4.1.4 Dynamic Capability and Organisational Innovation

The second hypothesis is the linkage between dynamic capability and organisational innovation. As stated by Agarwal and Selen (2009), DCs could play a vital role in helping organisations due to the ability of DCs to provide a proactive and systematic method by which to explore new opportunities and predict competitor threats. In this respect, Verona and Rabasi (2003) claim that an organisation needs to develop DCs which allow the continuous and simultaneous creation, absorption and integration of knowledge to maintain higher innovation levels. Zheng et al.'s (2011) fieldwork also shows a strong relationship between innovation performance and DCs. Hsu and Sabherwal (2012) found that DCs positively affect innovation. Likewise, Danneels (2010) examined how organisational inability to change the resource base prevents it from generating viable, competitive new products. Furthermore, there are different examples of the previous studies have found a significant relationship between different dynamic capabilities considered in this research (sensing opportunities capabilities, learning capabilities, integrating capabilities and coordinating capabilities) (Morgan et al., 2004; Lisboa et al., 2011; Gao and Zhu, 2015; Giniuniene and Jurksiene, 2015; Janssen et al., 2015). In contrast, a few studies found that these different dynamic capabilities have an insignificant consequence on organisational innovation (Bessant and Phillips, 2013; Nieves and Haller, 2014; Tondolo and Bitencourt, 2014; Camisón and Villar-López, 2014; Zitkiene et al., 2015).

The conceptual relationship between dynamic capability and organisational innovation as showed in previous studies, shows a significant relationship between dynamic capability and organisational innovation. Thus, this Research hypothesises a significant relationship as follows:

H4: Dynamic capability (Sensing Opportunities Capability, Learning Capability, Integrating Capability and Coordinating Capability) will have a direct positive effect on Organisational Innovation

H4-1: Dynamic Capability (Sensing Opportunities Capability, Learning Capability, Integrating Capability and Coordinating Capability) will have a direct positive effect on exploitative innovation.

H4-2: Dynamic Capability (Sensing Opportunities Capability, Learning Capability, Integrating Capability and Coordinating Capability) will have a direct positive effect on explorative innovation.

3.4.1.5 Dynamic Capability and Performance

Capabilities are not only important for the aspects related to the organizational performance but also they could have crucial role in contributing a firm's development. As DCs are often located in intangible resources, they are hard to imitate and so can be said to be firm dependent (Shane, 2002). It is their unique character that makes capabilities a source of competitive advantage. In this respect, Eisenhardt and Martin (2000) claim that the value of DCs for competitive advantage can be found in the resource configurations that they create. This leads them to conclude that DCs have equifinality, are replaceable and mutually interchangeable, and so many firms in fact have similar DCs. Therefore, competitive advantage is one of the main aspects that is largely correlated by DCs As stated by Teece et al. (1997). The conclusion is a circular one in that if an organisation has a DC, it must perform well, and if performing well, it should have a DC. At the other end, Zott (2003) claims that DCs are indirectly linked to the performance of organisations as the aim is to change a firm's bundle of resources, operational routines and competencies, which in turn affects economic performance. In details, DCs and performance have mainly been considered in terms of either a firm's economic performance or changes in operational capabilities. However, the mechanisms through which DCs have an impact on performance have not been clarified. The researcher has found six studies that perceive a direct relationship between DCs and performance. Kenya (2017) examines the influence of the three DC dimensions (i.e. sensing capabilities, seizing capabilities and reconfiguration capabilities) on organisational performance. The primary data for this study was taken from 271 organisations in Nairobi County, Kenya, and showed that sensing capabilities influenced their performance. Zhou et al. (2017) studied the mediator role of innovation between DCs and organisational performance from a sample of 204 organisations in China. Results using partial least squares structural equation modelling support the hypothesis that innovation does play such a role. Soumodip, Dulce & João (2016) examine the relationship between market, entrepreneurial and learning orientations, DCs, and performance using a little-used integrative approach.

They showed a direct positive effect on performance that learning orientation and an aspect of entrepreneurial orientation can have. At the same time, DCs mediate the relationships between some strategic orientations and organisational performance. Overall, organisational performance is enhanced when DCs are mixed with the appropriate strategic orientations. Osisioma and Nzewi (2016) studied the relationship between DCs and the performance of some banks found in a Nigerian city called Awka. The objective was to understand the relationship between sensing capability and bank performance. They found a significant positive relationship between the two in two of the banks under research which prompted the conclusion that such capabilities do indeed enhance organisational performance. A study by Kihara, Ngugi and Ogollah (2016) focused on the influence of DCs on the performance of selected manufacturers in Kenya. The results showed that DCs have a positive and substantial effect on the performance of such Kenyan organisations Naldi, Wikström and Rimscha (2014) adopted Teece's DC concepts to investigate small- and medium-sized organisations competing in the creative industries, specifically the audiovisual production industry in Europe. They found that both sensing and seizing capabilities enhanced the innovative performance of firms. Given this, a further hypothesis in this Research is that:

H5: Dynamic Capability (Sensing Opportunities Capability, Learning Capability, Integrating Capability and Coordinating Capability) will have a direct positive effect on performance

3.4.1.6 Organisational Innovation and Performance

It has been largely argued the key mechanisms of innovation as leverage of the performance by helping organizations in acquiring new knowledge, new process and new products and services (Aragon-Correa et al., 2007). Therefore, organizational innovation has been increasingly considered as competitive necessity rather than comparative advantage over highly dynamic environment. Through empirical research on the Sri Lankan insurance industry, Rajapathirana and Hui (2017) consider the relationship between innovations capability, innovation type and the different parts of organisational performance, including innovation, market and financial performance. This fieldwork verified their hypothesis as it confirmed the strong relationship between innovation capabilities, innovation efforts and organisational performance. The recommendations of this study could mean effective

management of innovation capability; this would help to deliver more effective innovations outcomes and increase performance which would benefit the insurance companies. In the study by Suhag, Solangi, Larik, Lakho and Tagar (2017) on the telecommunications sector, the relationship between innovation and organisational performance was studied. It was concluded that product innovation, process innovation and organisational innovation positively impact upon organisation performance.

For their part, Gomes and Wojahn (2017) studied small- and medium-sized companies. It was shown that organisational learning capability influences their innovative performance. Valmohammadi (2017) studied Iranian manufacturing firms within a framework which analysed the relationships between customer relationship management practices, organisational performance and their innovation capability. The results showed that such practices have a positive albeit not profound effect on organisational performance and their innovation capability. Improvements in innovation caused by customer relationship management practices also bring about improved organisational performance. Moreira, Gherman and Sousa (2017) conducted empirical research on the innovativeness-performance relationship by examining the kinds of innovation that influence the relevant performance measures in healthcare institutions. Through this, they showed that organisational innovation correlates with process innovation and service innovation. Moreover, the influence on service and process innovations can be seen on operational performance. As such, a further hypothesis is that:

H6: Organisational Innovation (exploitative innovation and explorative innovation) will have a direct positive effect on performance

3.4.1.7 Dynamic Capability as a Mediator between TMT Characteristics and Organisational Innovation

The fourth hypothesis relates to the mediating role of dynamic capability between TMT characteristics and organisational innovation. Importantly, the ability to identify opportunities is largely dependent on the individual's capabilities and extent of knowledge, particularly about the needs of the users and customers in relation to existing and new solutions (Teece, 2004).Teece (2009) also states that the competitive edge of organisations lies within its

managerial and organisational processes. To put differently, the skills, knowledge and background that executives bring all play a crucial role in determining the organisations strategic choices (Deed et al., 200). However, top managers impact organisational innovation indirectly; more studies are needed to investigate the factors that mediate the relationship (Elenkov and Manev, 2005). In the current study sitting, there is no study that has tested DC as a mediator factor comprehensively. Therefore, there is a lack of the current understanding about the important role of DCs as mediator in predicting the link between top managers and organisational innovation (Hsu et al., 2008; Penrose and Pitelis, 2009).

Additionally, there are inconsistent findings, some previous studies found a significant impact for dynamic capability between TMT characteristics and organisational innovation (Venkatraman, 1989; Teece, 2007; Edelman et al., 2005; Lin and Wu, 2014). Fainshmidt, Pezeshkan, Frazier, Nair and Markowski (2016) investigate the relationship between DCs and performance, and the mediating role of technological dynamism. The findings are that, not only are DCs positively related to performance, but also that higher-order DCs are more strongly related to performance than lower-order ones, with lower-order ones partly mediating the relationship between higher-order DCs and performance, and DCs assist more towards performance in developing economies than in developed ones. In their study, Rehman and Saeed (2015) analysed the impact of DCs on organisational performance, and the moderator role of organisational competencies.

Their results were that DCs directly impact on a firm's organisational performance, and that organisational competencies have a positive moderating role between organisational performance and DCs. Genc, Volberda and Sidhu (2015) stated that the positive effect of DCs on management innovation helps a firm to introduce product or service innovations whether they are exploitative or exploratory in nature. The result is an increase in the organisations performance. The findings show that DCs have a partial mediating effect on organisational performance through the variables of management innovation and exploitative innovation. Furthermore, there is a positive relationship between management innovation and exploratory innovation although their mediating effect on organisational performance is insubstantial. Nedzinskas et al. (2013) reviewed the influence of small- and medium-sized enterprises' DCs on organisational performance, as well as the interaction between DCs and

organisational inactivity in an unstable environment. They found that DCs have a positive effect on non-financial relative organisational performance. A small number of studies also found that there was a minimal effect for the mediating role of DCs (Lin and Wu, 2014; Osisioma et al., 2016). Thus, based on the above findings, the Researcher hypothesises that:

H7: Dynamic Capability will mediate the relationship between TMT characteristics and Organisational Innovation

H7-1: Dynamic Capability will mediate the relationship between Average Age of TMT Members and Organisational Innovation

H7-2: Dynamic Capability will mediate the relationship between Educational Level of TMT Members and Organisational Innovation

H7-3: Dynamic Capability will mediate the relationship between Tenure Diversity / Heterogeneity of TMT Members and Organisational Innovation

H7-4: Dynamic Capability will mediate the relationship between Functional Experience of TMT Members and Organisational Innovation

H8: Dynamic Capability will mediate the relationship between TMT characteristics and Performance

H8-1: Dynamic Capability will mediate the relationship between Average Age of TMT Members and Performance

H8-2: Dynamic Capability will mediate the relationship between Educational Level of TMT Members and Performance

H8-3: Dynamic Capability will mediate the relationship between Tenure Diversity / Heterogeneity of TMT Members and Performance

H8-4: Dynamic Capability will mediate the relationship between Functional Experience of TMT Members and Performance

3.5 Development of the Research Framework

The hypotheses discussed above have created theorised relationships between the variables of this research. Based on the variables, the theoretical framework developed suggests that the different variables in the research are related to one or more variables in relation to TMT characteristics, dynamic capabilities, organisational innovation and performance.

The aim of this section is to develop theoretical guidance for implementation of the strategic framework to academia and the private industry that relate to TMT characteristics, dynamic capabilities, organisational innovation and performance in the construction sector (medium and small).

This chapter discusses the derivation of all the proposed components of the Proposed Research Framework (TMT characteristics, dynamic capabilities, organisational innovation and performance) based on the literature gap highlighted in Section 2.8 in Chapter 2. All key elements of the framework are presented and explained in theoretical terms.

The theoretical assumptions underlying the proposed framework form the basis for the collection and analysis of data which then leads to the validation of the framework. Evidence of this is presented in Chapter 5 of this research.

3.5.1 Derivation of the Theoretical Proposed Framework

This section examines the derivation of the proposed theoretical framework as it relates to one or more variables in relation to TMT characteristics, dynamic capabilities, organisational innovation and performance through the evaluation of the framework mentioned in Chapter 3 Section 3.5.1. as well as, the formulation of the literature gap in Section 2.8 in Chapter 2.

The proposed theoretical framework was initially inspired by existing approaches to Upper Echelons Theory to TMT Characteristics, Resource Based View Theory, Contingency Theory to Organisational Innovation and supported by various academic and industry contributions to TMT characteristics, dynamic capabilities, organisational innovation and performance research in the last two decades.

In an attempt to address all relevant gaps revealed by the research Section 2.8 in Chapter 2, the framework is derived from the literature based on the existing theories, rather than from a single theory. Contributions to that literature have been classified based on the research literature gap Table 2.2, Section 2.8 in Chapter 2.

As concluded in the research literature gap Table 2.2, Section 2.8 in Chapter 2, in the first area (relationship between TMTs and performance) it is mentioned that it is essential to investigate the effect of TMTs on performance as Guo, et al., (2018), Tanikawa, et al., (2017), Tulung & Ramdani (2016) and Li et al. (2015) stated. In the second area (relationship between TMTs and Dynamic Capabilities) it is mentioned that the fact that TMT characteristics might be using more developed dynamic capabilities could result in better innovation; additionally, the relationship between TMT characteristics and dynamic capabilities is still unclear (Ruiz-Jiménez and Fuentes-Fuentes, 2016; Maghzi et al., 2015; Proeller et al., 2011; Proeller and Siegel, 2010 and Andrews et al., 2009).The third area (relationship between TMTs and Organisational Innovation) mentions that it is important to investigate the relationship between top level managers and their organisation's innovativeness in different contexts, in addition to paying attention to the relationship between top level managers and their organisation's innovativeness (Lee et al., 2017; Sperber & Linder, 2016; Yuan et al., 2014; Yang and Wang, 2014; Heyden et al., 2013 and Mihalache et al., 2012). In the fourth area (relationship between Dynamic Capabilities and Organisational Innovation) it is mentioned that dynamic capabilities are of vital importance in service organisations, as they provide a systematic and proactive way to explore new opportunities and anticipate threats from competitors; additionally, the process of innovation can be enhanced by an organisation's ability to combine and integrate individual internal inputs into a new collective logic of interaction through integrating and coordinating capabilities (Jimenez-Jimenez and Sanz-Valle, 2011; Danneels, 2010; Agarwal and Selen, 2009; Protogerou et al., 2008; Verona and Rabasi, 2003). The fifth area (relationship between Dynamic Capabilities and performance) mentions the importance of analysing the relationship between markets, entrepreneurial and learning orientations, dynamic capabilities, and performance using an integrative approach hitherto little explored (Nyachanchu, et al., 2017; Ringov, 2017; Soumodip et al., 2017; Fainshmidt et al., 2016; Osisioma & Nzewi, 2016; Kihara et al., 2016). The sixth area (relationship between Organisational Innovation and performance) mentions the importance of analysing the influence of the performance of healthcare organisations, unconcluded that innovation in healthcare units has an overall impact on their financial performance (Rajapathirana & Hui, 2017; Suhag et al., 2017; Gomes & Wojahn, 2017; Valmohammadi, 2017; Prifti & Alimehmeti, 2017; and Moreira et al., 2017). The seventh area (Mediating effect of Dynamic Capabilities) mentions the limited understanding of the role of dynamic capability in explaining the relationship between top

managers and organisational innovation; additionally, there are some difficulties in practice due to the lack of empirical works in support of this issue (Hsu et al., 2008; Penrose and Pitelis, 2009).

Using the seven areas depicted in Table 2.2, Section 2.8 in Chapter 2, which allows meticulous categorisation of research and identification of the literature gap,
Table 3.2 summarises the derivation of the proposed theoretical framework.

Variable	Phases and Literature Reference
Inputs	
TMT Characteristics	Guo et al. (2018); Tanikawa et al. (2017); Tulung & Ramdani (2016); Li et al. (2015); Ruiz-Jiménez and Fuentes-Fuentes (2016); Maghzi et al. (2015); Proeller et al. (2011); Proeller and Siegel (2010); Andrews et al. (2009); Lee et al. (2017); Sperber & Linder (2016); Yuan et al. (2014); Yang and Wang (2014); Heyden et al. (2013) and Mihalache et al. (2012)
Process	
Dynamic Capabilities	Jimenez-Jimenez and Sanz-Valle (2011); Danneels (2010); Agarwal and Selen (2009); Protogerou et al., (2008); Verona and Rabasi (2003); Nyachanchu et al. (2017); Ringov (2017); Soumodip et al. (2017); Fainshmidt et al. (2016); Osisioma & Nzewi (2016); Kihara et al. (2016)
Outputs	
Organisational Innovation	Rajapathirana & Hui (2017); Suhag et al. (2017); Gomes & Wojahn (2017); Valmohammadi (2017); Prifti & Alimehmeti (2017); Moreira et al. (2017)
Outcomes	
Performance	

Table 3-1 Derivation of Theoretical Proposed Framework

3.6 Chapter Conclusion

In this chapter, the hypotheses of this research have been stated. The chapter has also explained thoroughly the steps taken to create and construct the proposed framework for this Research. The first part was explaining the adopted theory which is Upper Echelons Theory which is related to TMT characteristics that are based on the premise that executives make strategic choices in line with their own experiences and biases, and that demographic information is a good measure of these constructs. Contingency theory which is connected to organisational innovation emphasises the effectiveness of a unit's exploratory and exploitative innovation under different contextual conditions. RBV theory, which can be considered as a basis for DC, explains how a organisation can use its intangible resources to conceive of and implement valuable strategy that increases performance.

Furthermore, the relationships between the factors were explained and justified as TMT characteristics and their link to organisational innovation which is the independent variable and performance, while dynamic capabilities represented the mediator variable to see if these capabilities help in improving the relationship between TMT characteristics, organisational innovation and performance; additionally, the hypotheses were formulated based on the relationship justification. Then the conceptual model was figured to the direct and indirect relationships between the factors.

4 Research Methodology

4.1 Overview of the Chapter

The research methodology is considered to be the systematic or scientific framework that sets the procedures in order to solve the research problem (Saunders et al., 2007). This makes the research methodology very critical to the attainment of the research objectives. Choosing the proper research methodology will show how the research should be conducted and influences the quality of the results for the research (Creswell, 2014). This chapter presents a review of the basis for selecting a research methodology and presents a justification for the chosen research methods. The chapter is divided into seven main sections. This includes an overview of research methodology, followed by a review of research paradigms. The third section covers aspects of research design followed by the sampling approach adopted for this research. The fifth section discusses sampling methods, and data collection. This section is followed by the discussion on structural equation modelling as the approach adopted for this research. The seventh section presents the test for reliability and validity for this Research. The eighth section presents the pilot study conducted prior to collecting data for this Research.

4.2 Research Methodology

Academic literature emphasises that research methodology is a critical part of research. Creswell (2014) states that a number of aspects influence the research method that is chosen: the type of questions that need to be answered, the philosophical views held by the researchers, the extent of the investigation and the pre-existing amount of information on the subject. The research methodology represents a loose framework that the researcher can use to decide how to answer the research questions and achieve the research objectives. This normally includes a description of the manner of data collection and how they are related to data sources, the way data will be processed and the ethics behind the data.

The choice of research methodology also includes choosing the research design, research methods and research paradigm that is part of the research design (Creswell and Clark, 2007). As stated by Golafshani (2003), the research paradigm sets out the fundamental philosophical

values for selecting the research methods which, in their turn, determine the research design. Careful consideration of these three key components helps to determine the most suitable research methodology in the research study (Chen and Hirschheim, 2004).

The methods used in this research are questionnaire surveys and interviews. The survey research method is popular in strategic management as it enables the effective collection of significant amounts of data from a large population (Abareshi and Martin, 2009).

4.3 Research Paradigm

The research paradigm is the philosophical perspective on which the research is based. As stated by Lincoln et al. (2011), its role is to steer the exploration of a certain phenomenon, with the paradigm consisting of a set of beliefs and perceptions that facilitate this (Lincoln et al., 2011). The research paradigm has a number of tasks. It defines how the research works, how knowledge/information is extracted, the questions posed and the proper methodologies necessary to answer these questions (Dill and Romiszowski, 1997). Lincoln et al. (2011) also state that a research methodology comprises three aspects which are ontological, epistemological and methodological in nature. Ritchie and Lewis (2003) explain that ontology relates to the nature of the phenomenon, whether it is neutral or formed by the researcher himself. As for epistemology, this relates to the nature of knowledge. This focuses on whether the knowledge is evaluated by empirical theories or created by the researcher following a study of the social context. The third aspect is the methodological one. This concerns the method for gathering and examining the information to bring about conclusions. Lincoln et al. (2011) explain that methodology refers to making a choice over the method employed for gathering and evaluating data, namely between quantitative and qualitative research.

Selecting a research paradigm normally means choosing between positivism and interpretivism. These two differ in relation to the three aspects of the research methodology described above and in Table 4.1. Positivism is based on the rationality of science and with a perspective that the world works according to laws just as the physical world works. It is for the most part “represented through (a) the interpretation and the objective of the data for the research, (b) the hypotheses formulation, framework and models, or explaining the constructs

causal relationship, and (c) the quantitative method way of use" (Chen and Hirschheim, 2004). Further, the main assumption of the positivist perspective largely depends on the thought that the social research problem could be objectively addressed and tested by using more empirical and quantitative data (Myers, 1997). Due to the nature of the current study which requires researcher to be involved with the research problem and subjectively evaluate different aspects related to the Saudi context, more qualitative data are requested. This especially in the light of the fact that there is a lot of aspects related to the Saudi construction context are absent and needs more clarifications based on the thoughts of the people who are associated with the current study problem there. So that, it is not enough to examine the current study problem based only on what has been suggested on the prior theories over the related area. The main criticism of positivism is that it does not offer an in-depth understanding of phenomena as the researcher is the one conducting the analysis.

Assumption	Explanation	Paradigm	
		Positivism	**Interpretivism**
Ontology	What is the nature of the world?	Reality exists objectively and independently from the researcher.	Emphasises the subjective meaning of the reality constructed and reconstructed through a researcher and social interaction process.
Epistemology	How do I know the world?	Concerned with the hypothetic deductive testability of theories. Scientific knowledge should allow verification or falsification and seek generalisable results.	Scientific knowledge should be obtained through the understanding of human and social interaction by which the subjective meaning of the reality is constructed.
Methodology	What is the best way for gaining the knowledge about the world?	Researchers need to take a value-free position and employ objective measurement to collect research evidence using quantitative methods.	Researchers need to engage in the social setting investigated and learn how the interaction takes place from participants' perspectives using qualitative methods.

Table 4-1 Research Paradigms
Source: Carson et al., 2001

In contrast, interpretivism holds a more social sciences view than a physical worldview. This takes a subjective understanding of the social world. "Interpretivism is for the most part seen through (a) the subjective elucidation for the data of the research, (b) the association of the specialist in the particular social settings in the examination, and (c) qualitative method using" (Mertens, 2009; Creswell and Clark, 2010). The main drawback of interpretivism is the absence of an explanation for the research findings due to the small sample sizes in the research study (Creswell and Clark, 2010). To put differently, the interpretive approach does not consider the existence of theoretical foundation which based on the social research problem could be empirically examined. Therefore, the main source of knowledge based on this paradigm is qualitative data (Hussey and Hussey, 1997). Yet, as discussed in the prior chapter, the current study proposed its conceptual model base on the solid theoretical foundation. This, in turn, requires collecting large amount of statistical quantitative data from large number of people who are engaged with the current reseaech problem in Saudi Arabia to validate the current study model. This would not be able to achieved using exclusively interpretivism.

In order to build on the strengths of these two paradigms whilst reducing their weaknesses, a third paradigm termed pragmatism was suggested recently (Denscombe, 2008). Pragmatism is not associated with any philosophical system but aims to combine existing research methods in certain ways to offer objective answers to the research questions. It does this by focusing on the "what" and "how" questions to solve research problems. The Researcher will employ the pragmatism paradigm in this research because only those concepts that support action are seen as relevant. Proponents "recognise that there are many different ways of interpreting the world and undertaking research, that no single point of view can ever give the entire picture and that there may be multiple realities" (Saunders et al., 2012). The research question is all-important in the pragmatism paradigm as it is a determinant of the philosophy employed.

As shown in the table below, in contrast to the other two research philosophies, pragmatism can combine more than one research approach and strategy within the same study (Wilson, 2010).

	Research Approach	Ontology	Axiology	Research Strategy
Positivism	Deductive	Objective	Value-free	Quantitative
Interpretivism	Inductive	Subjective	Biased	Qualitative
Pragmatism	Deductive/ Inductive	Objective or Subjective	Value-free/ Biased	Qualitative and/or Quantitative

Table 4-2 Positivism, Interpretivism and Epistemologies
Source: Wilson, 2010

4.4 Research Design

The research design is the layout created by the researcher to facilitate collection and synthesis of the research data to deliver the findings of the research. The research design is a means of helping the researcher decide on four issues: (a) the types of questions that need to be answered, (b) the types of data appropriate for the study, (c) the way the data should be collected, and (d) the way the data should be analysed (Creswell and Clark, 2010). An effective research design is one that offers the researcher valuable recommendations and guidelines to achieve the research objectives and enable a timeline to be set for this purpose (Creswell and Clark, 2010).

Table 4-4 gives a detailed description of the research design.

Method	Approach	Description
Quantitative	Laboratory Experiment	The investigation of exact connections between controlled variables utilising non-stockholding members for tackling a simulated issue.
	Field Experiment	An analysis including members for managing a genuine issue. The quantity of variables is typically limited.
	Survey	A preview of presumptions or a true circumstance at a specific point in time, generally using a survey to all members and analysed using a statistical method.
	Forecasting	The utilisation of different extrapolation routines to take actualities or sentiments utilising specific presumptions as a part of request to conclude future results.

	Simulation	An examination of conduct in a framework which is a reflection of this present reality with controlled variables; however, not to the degree of a lab test.
Qualitative	Interview	A continuous discussion between the specialist and members for finding the perspective of the members. It runs from structured interviews through to unstructured, open-ended discussion.
	Action Research	An examination of connections in one or more associations where the exploration is included and the researcher's impact must be acknowledged.
	Case Study	A centred examination of guessed connections in one or more associations. A researcher is an observer. A large number of variables are involved with little or no control.
	Grounded Theory	Exploration situated in the perceptions or information from which it is created. It utilises a mixture of information sources, including audit of records, meetings and perception.

Table 4-3 Research Design
Source: Creswell and Clark, 2010

4.4.1 Choice of Research Design

Following the discussion above, a choice of research design has been made that will help achieve the aim of the research. The decision is based on the nature of the research questions and the level of knowledge sought from an investigation into TMT characteristics and DCs. Pragmatism is believed to be the most relevant paradigm to form the basis for this investigation. As stated in the previous section, a mixed-method approach will be adopted using questionnaire surveys and interviews. The surveys will be employed to analyse TMT characteristics, organisational innovation, performance and the mediating role of DCs, as well as the causal relationships (Hair et al., 2010). On the other hand, the interviews offer in-depth insights into the survey results. The use of surveys is appropriate in the quantitative phase as a means of testing and confirming the conceptual framework set out in Chapter 3, and to consider the relationship between the TMT, organisational innovation, performance and DCs through fieldwork.

There are limitations to the use of surveys for this kind of study – the main one being that they give a brief description for certain circumstances at a certain point, which means that only a small amount of information is delivered for the study. Instead of questionnaire

survey, interview approach would help interviewees to capture explanations and explanations for any questions that may arise immediately from interviewer. This will enrich the quality and quantity of the data collected (Bhattacherjee, 2012). It is common to use both as a means of complementing data and overcoming their individual weaknesses. On this, Attewell and Rule state that the "traditional survey approach is strong in areas where field approaches such as interview are weak", and they go even further by claiming that "each is incomplete without the other" (Attewell and Rule, 1991). In addition, Gable (1994) argues that the benefits of integrating the interview and the survey research are twofold: it creates context within the research, and it improves the quantitative results by increasing the internal validity. This is the reason why interviews were also employed, namely because they will explain the survey results and any unexpected results. It is also important to justify selecting survey as a one of the main research design for the current study. Firstly, for the purpose of the current study there is a need to collect a large amount of quantitative data from adequate number of participants in the KSA, survey is one of the most effective research design to systematically approached the targeted participants and capturing a lot of information regarding their emotional, behavioural, and cognitive reactions (Bhattacherjee, 2012; Saunders et al., 2003). This is in addition the high degree of generalisability reached in the yielded results based on the survey data (Bhattacherjee, 2012).

Having determined that a combination of quantitative and qualitative approaches would give the best results, the next step is to decide the most effective way to combine the two approaches to maximise their advantages. Creswell and Clark (2010) set out three aspects that should be considered in this: priority, implementation and integration. Priority is determined according to the research objectives (Chapter 1) or the interests of the researcher. As the first phase aims to identify the causal relationship between TMT, organisational innovation and performance through the mediating role of DCs in Saudi Arabia (construction sector), which can be achieved by using a survey approach, a quantitative survey approach has been given precedence as the main means of data collection in the design of a mixed method approach, with the qualitative interview approach in a complementary position.

Implementing the mixed method approach to gather and review the data can be done in sequence or in parallel. In this research, the Researcher has followed a sequential explanatory

review. Specifically, the quantitative survey approach is used first to investigate the role of TMT characteristics to achieve organisational innovation and performance through DCs. This is followed by a qualitative interview approach to help explain the significance of such factors for achieving innovativeness in organisations. This was set out earlier in Figure 4.1.

In practical terms, the first phase will involve distributing surveys to TMTs to confirm the appropriateness of the conceptual model of Chapter 3. The second phase will involve semi-structured interviews conducted with top managers to help interpret and confirm the results of the statistical analysis and explain any unexpected results from the survey. To restate the thinking behind the choice of sequential explanatory analysis, quantitative analysis will explain the relationships between the factors and qualitative analysis will expand on the statistical results with in-depth views of participants.

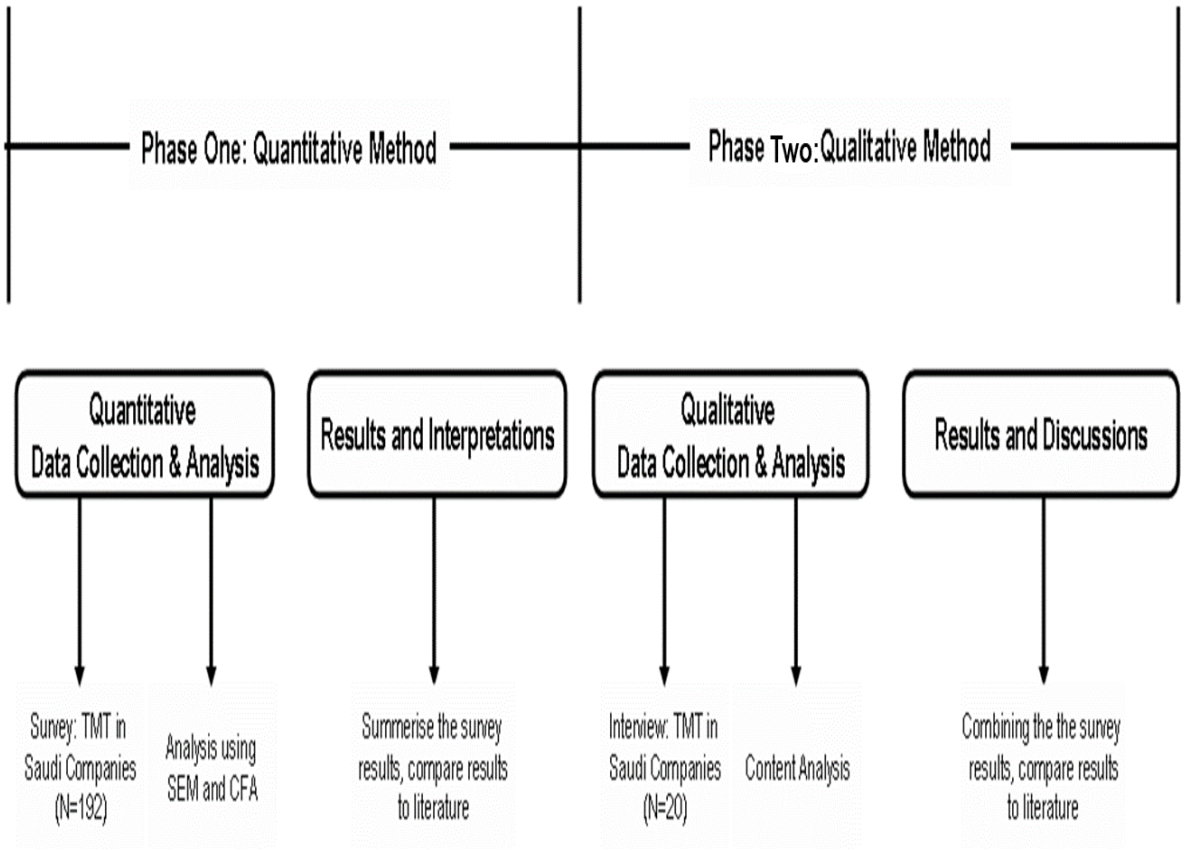

Figure 4-1 An Overview of the Explanatory Sequential Mixed-Method Design
Source: Creswell and Clark, 2010

4.5 Sampling

This section considers the sampling techniques that are suitable for mixed research and specifically sample composition. Normally, quantitative research is based on a large random sample while qualitative research is based on a smaller, purposive sample. A number of sampling techniques considered by the Researcher are discussed below.

Creswell (2012) states that the point of qualitative research is to identify clearly participants and settings in order to better understand the research problem. Purposive sampling of this kind stands in contrast to the random sampling of larger populations that occurs in quantitative research. Patton (1990, p. 169) states that purposive sampling involves "selecting information-rich cases for study in depth". This method requires research participants to have practical experience of the topic under discussion and be willing to share their views about it. In deciding on a sample, it is important for the researcher to establish a clear rationale and criteria.

Sampling methods can be classified as probability or non-probability ones. In the first, every individual in the population holds a non-zero probability of selection. Typical probability methods are random sampling, systematic sampling and stratified sampling. In random sampling, the nature of the population is defined and all members have an equal chance of selection. Non-probability approaches such as convenience sampling, judgment sampling, quota sampling, and snowball sampling involve choosing participants from the population in some non-random manner (Cochran, 2007).

4.6 Sample Size and Data Collection

The sample frame for this research consists of small- and medium-sized enterprises in the construction sector in Riyadh in the Kingdom of Saudi Arabia. The government is now more focused on countering house shortages due to increasing growth in the population. While there are big contractors in sector, there is the influx of

international firms winning international contracts and operating within Saudi Arabia. The rise in demand has led to the rise in many consortia developing locally and working alongside the big firms and the international firms. This situation is therefore not different from Western countries if it were not for the fact that the Saudi government prefers to work with Saudi firms more than international firms. The Researcher also wishes to state that he has a construction business within this region and also has more than seven years of relevant experience in the construction sector in Riyadh. So, in terms of research participants, the Researcher was well connected and this facilitated the administering of the questionnaire and interviews.

According to Creswell and Clark (2010), data collection is considered to be the process of organising and gathering useful information for the purposes of answering the research questions. The collection of data in this research starts with a questionnaire survey, which is followed by interviews. The next sections describe the processes adopted in collecting the survey and interview data. Various methods of identifying participants were therefore employed. This involves the use of business directories from the Ministry of Commerce to identify some participants for which a random sampling technique was then used to make sure respondents have equal chances of being selected. This was also facilitated by a snowball sampling technique which has been widely utilised in business research (Njinyah, 2018) and which relates to the Researcher's experience in the sector.

Practically, so as to reach the targeted participants, the process of data collection has started by visiting Chamber of Commerce and Industry in Riyadh as well as Ministry of Commerce & Investment. Accordingly, and based on information provided by these two official institutions, It was able to capture full details (i.e. addresses, phone numbers, the size of company, number of employees) about 64 Small and Medium size Enterprises in the Saudi consecution sector. Then, during two months, about 250 questionnaires were allocated over these 64 companies for those who are members in the top management team or engaged in the decision making process. Yet, out of 250 questionnaires were administered, 58 being rejected because the participants opted out and some did not provide enough information that was required. Accordingly, the valid responses subjected for further analyses were 192 with a response rate of 76.8%,

which is an acceptable response rate necessary for producing reliable results (Alexiev et al., 2010).

Once the collected questionnaire data was tested and yielded it their results, the interview questions were formulated based on the outcomes or the prior stage and researcher was able to approach 20 mangers in 64 companies which have been already targeted over the questionnaire stage. This stage had taken about one month from the total period of the data collection time. It is also important to mention that the vast majority of those participants were handed out the questionnaire or interviewed at their own workplace while quite few of them had been met at a suitable place selected by them. The questionnaire and interview were self-administered for the following reasons: 1) to make sure respondents provide answers to all questions as far as possible. 2) to maximise time and cost since I had very limited time to administer the questionnaires and interviews given the delay in obtaining clearance from the Saudi Embassy in London. Any other method could have delayed the process as respondents could have completed it at a time not appropriate for my Research completion.

The questionnaires were constructed both in English and Arabic and vice versa. This was to ensure that the meaning remained the same when interpreted in both languages. It was also to make sure participants who were not proficient in English but in Arabic could participate, as it is the native language of Saudi Arabia (see appendix). Due to my experience, network and involvement in this sector, I was able to arrange different time slots for respective participants in a booked room in a coffee shop where we all used to meet and have coffee. However, some participants were kind enough to complete the questionnaire and return it in good time.

4.6.1 Operationalisation of Variables

The definitions of the variables used in this research has already been done in Chapter 2 in which the Researcher reviewed the relevant literature with respect to TMT executive characteristics, dynamic capabilities, organisational innovation and organisation performance. In the section, the Researcher want to show how these variables are being measured. The main constructs are latent variables while the various questions used to capture them are categorised as observed variables.

The critical review leads the Researcher to the identification of these instruments: **Top Management Team Characteristics** (Average Age of TMT Members, Educational Level, Tenure Diversity and Functional Experience), **Dynamic Capabilities** (Sensing Opportunities Capabilities, Learning Capabilities, Integrating Capabilities and Coordinating Capabilities), **Organisational Innovation** (Exploitative Innovation and Explorative Innovation) and **Performance**. Therefore, these factors are the main constructs that are embedded in the survey. In order to measure the current instrument of the research, the Researcher used a five-point Likert-scale which is used widely in business research (Hair et al., 2010). This scale ranges from 1= strongly agree to 5 = strongly disagree. The benefit of such a scale is that it prevents the participants from recalling their responses from previous scales and also reliability increases with increased scale number and decreases as the scale starts going above six (Robeson and O'Connor, 2013; Tashakkori and Teddlie, 2003).

4.7.1.1 Top Management Team (TMT) Characteristics

The sub factors of TMT characteristics are: Average Age of TMT Members, Educational Level, Tenure Diversity/ Heterogeneity and Functional Experience. Table 4.4 describes the constructs and the items for measuring the TMT characteristics, and the origin of these instruments.

Constructs	Categorisation		Origin of Categorisation
Age	Less than 30 Years	From 30 – 34 Years	Gool et al., 2007; Camelo et al., 2010; Bany-Ariffin et al., 2014; Liu et al., 2014, Yang and Wang, 2014; Yoon et al., 2016
	From 35 – 39 Years	From 40 – 44 Years	
	From 44 – 48 Years	49 and above	
Educational Level	BSc	High Diploma	
	Master	PhD	
Tenure Diversity / Heterogeneity	Less than 5 Years	From 5 – 9 Years	
	From 10 – 14 Years	15 and above	
Functional Experience	Chairperson	General Manager	
	Vice General Manager	Vice President	
	Chief Officer		

Table 4-4 Measurements of TMT Characteristics Constructs

4.7.1.2 Dynamic Capability

The sub factors of Dynamic Capabilities are: Sensing Opportunities Capability, Learning Capabilities, Integrating Capability and Coordinating Capability. Table 4.5 describes the constructs and the items for measuring the dynamic capability, and the origin of these instruments. Respondents were asked to provide their responses for the following items under each category ranging from 1= strongly agree to 5 = strongly disagree.

Constructs	Items	Origin of Items
Sensing Opportunities Capabilities	TMT scan the environment to identify new business opportunities.	Teece, 2007; Pavlou and El Sawi, 2011; Lin and Wu, 2014; Nieves and Haller, 2014; Tondolo and Bitencourt, 2014; Osisioma et al., 2016; Rezazadeh et al., 2016
	TMT review the business environment to know the likely effect of changes in firm business environment on customers.	
	TMT review the product development efforts to ensure they are in line with what the customers want.	
	TMT devote a lot of time implementing ideas for new products and improving the existing products.	
Learning Capabilities	TMT have effective routines to identify, value, and import new information and knowledge.	
	TMT have adequate routines to assimilate new information and knowledge.	
	TMT are effective in transforming existing information into new knowledge.	
	TMT are effective in utilising knowledge in new products.	
	TMT are effective in developing new knowledge that has the potential to influence product development.	
Integrating Capability	TMT are forthcoming in contributing individual input to the group.	
	TMT have a global understanding of each other's tasks and responsibilities.	
	TMT are fully aware who in the group has specialised skills and knowledge relevant to the work.	
	TMT carefully interrelate their own actions to each other to meet changing conditions.	
	TMT manage to successfully interconnect their activities.	
Coordinating Capability	TMT ensure that the output of work is synchronised with the work of others.	
	TMT ensure an appropriate allocation of	

	resources (e.g., information, time, reports) within the group.	
	TMT are assigned to tasks commensurate with their task-relevant knowledge and skills.	
	TMT ensure that there is compatibility between group members expertise and work processes.	
	Overall, TMT are well coordinated.	

Table 4-5 Measurements for Dynamic Capabilities Constructs

4.7.1.3 Organisational Innovation

The sub factors of Organisational Innovation are: Exploitative Innovation and Explorative Innovation. Table 4.6 describes the constructs and the items for measuring dynamic capability, and the origin of these instruments. Respondents were asked to provide their responses for the following items under each category ranging from 1= strongly agree to 5 = strongly disagree.

Constructs	Items	Origin of Items
Exploitative Innovation	Top management group refine the provision of existing products and services.	Jansen et al., 2006; Li et al., 2010; Schamberger et al., 2013; Findikh et al., 2015; Guan and Liu, 2016; Popadic et al., 2016
	Top management group implement small adaptations to existing product and services	
	Top management group introduce improved, but existing products for local market.	
	Top management group improve their provision's efficiency of products and services.	
	Top management group increase economies of scales in existing markets.	
	Top management group in firm expand services for existing clients	
Explorative Innovation	Top management group firm accept demands that go beyond existing products and services.	
	Top management group invent new products and services.	
	Top management group experiment with new products and services that are completely new to the firm.	

	Top management group commercialise products and services that are completely new to the firm.	
	Top management group utilise new opportunities in new markets.	
	Top management group in firm use new distribution channels.	

Table 4-6 Measurements for Organisational Innovation Constructs

4.7.1.4 Performance

The item measurements for Performance total eight. Table 4.7 describes the items for measuring the performance, and the origin of these instruments.

Variables	Items	Origin of Items
Performance	The sales growth position relative to our principal competitor is:	Croteau & Raymond, 2004; Agarwal et al., 2003
	My satisfaction with sales growth rate is:	
	The market share gains relative to our principal competitors are:	
	The return on corporate investment position relative to our principal competition is:	
	My satisfaction with the return on corporate investment is:	
	My satisfaction with return on sales is:	
	The net profit position relative to our principal competitor is:	

Table 4-7 Measurements for Performance

All items in the Performance measurements were measured on a five-point Likert-scales ranging from much worse (1) to much better (5).

4.7 Pilot Study

Van Teijlingen et al. (2001) state that there are a number of reasons for researchers to conduct a pilot study. These are: (1) to develop and test the suitability of research instruments; (2) to identify logistical problems that might arise during data collection;

(3) to estimate variations in outcomes to better determine sample size; (4) to establish whether the sampling frame and technique will prove effective; and (5) to gather preliminary data. The pilot study also allows the reliability, validity and viability of the research instrument to be tested, and to establish the length of time required to conduct the main study. The reliability test for each construct was estimated through the pilot study data.

One of the criteria for selecting post instruments was internal consistency of the scales using Cronbach's alpha reliability coefficients. Besides that, the results from the pilot and the comments and suggestions from the feedback were used to improve the questions for the final questionnaire.

The questionnaire was given to a sample of general managers consisting of 30 respondents. Then, the questionnaire was checked and revised by the Researcher for any inadequacy that may have emerged when the respondents' answered the items. After that, the data were analysed using SPSS for reliability. The reliability test for each instrument was calculated using the pilot study data.

Table 4.9 below shows the reliability coefficient (Cronbach's alpha) for all the main constructs used in the pilot study, compared to the reliability of the constructs from past studies. The results of the Cronbach's alpha were determined using the SPSS program.

Variable Name	Number of Items	Cronbach's alpha Pilot/30
Sensing Opportunities Capabilities	4	0.691
Learning Capabilities	5	0.784
Integrating Capability	5	0.751
Coordinating Capability	5	0.750
Exploitative Innovation	6	0.864
Explorative Innovation	6	0.846
Performance	7	0.874

Table 4-8 Reliability Coefficient for Main Constructs

As shown in Table 4.9, all the constructs show Cronbach's alpha readings of acceptable values of above .60 (Hair et al., 2006). The reliability value for all constructs ranged from (0.691) to (0.864). Thus, the final actual distribution was conducted without any modification as explained in the distribution method.

4.8 Data Access and Analysis Procedure

Data analysis is a process by which gathered data are examined, filtered, transformed and then modelled in order to give answers to the research questions. Data analysis is a research stage for a number of activities, such as inputting responses, screening data and choosing an appropriate data analysis strategy. SPSS software version 23.0 was adopted to conduct some of the statistical tests. In the final stage the Structural Equation Modelling (SEM) AMOS 23.0 was used to analyse data and conduct the testing of hypotheses.

The data analysis was in two stages – quantitative data analysis and qualitative data analysis. The first was conducted over five steps. With a view to ensuring the dataset was ready for further statistical analysis, step one involved data screening, namely missing data assessment, outlier assessment, normality assumption assessment and non-response bias analysis. This was followed by demographic analysis to pinpoint TMT characteristics. This analysis is discussed in detail in Chapter 5. Step three involved confirmatory factor analysis (CFA) using SEM to test and validate the initial conceptual model. In step four, regression analysis was employed to test the hypotheses according to the conceptual model. In step five, any unexpected results from hypotheses testing were considered through an alternative model using SEM. This section presents a discussion of the principles for conducting data screening and the CFA using SEM.

4.8.1 Data Entry

Through the data collection process, 192 acceptable responses were received. The acceptable respondents (192) were analysed using SPSS software version 23.0. This involved data editing and coding. According to Zikmund-William (2003), the purpose of data coding is systematic storage. In the present research, data coding was done

with the help of SPSS software version 23.0. Data coding was done by the appropriation of character symbols (mostly numerical symbols) on the data. This helps to easily represent the questions in the SPSS software.

4.8.2 Data Screening

Information screening is a task that must be undertaken to make sure there is no ambiguous information that will damage the results. Data screening is carried out to minimise errors in measurement in the dataset and to ensure the dataset meets the requirement in the analysis. Data screening involves four steps: missing data evaluation, identification of outliers, Kurtosis and Skewness, and the SEM (Byrne, 2010).

4.9.2.1 Missing Data

Missing data are those values which respondents have not answered in the survey. This results in a smaller sample size that can be analysed and biased results being produced in the data analysis. This can be avoided in surveys by checking for any missing value from the data entry. A reminder can be sent to respondents to fill in any missing questions.

Two initiatives were adopted in this project to overcome missing data. Where the missing data were located in the demographic section, a decision was made to consider using the survey as what was missing would not affect subsequent statistical analysis. However, where the missing data was in the second section which covers the role of DCs in the relationship between TMT characteristics and organisational innovation, then a listwise deletion of the survey was carried out.

4.9.2.2 Outliers

Outliers are made up of extreme data values that differ dramatically from other data values. Outliers can have a meaningful effect on the appearance of the model, perceived parameters and errors in the dataset. A standardised residual is factored in as a means of consistently identifying outliers in a dataset. This measures the deviation performed by the observed frequency from the expected frequency of this

data value. A value is deemed an outlier if it creates a standardised residual higher than 3.0 or lower than -3.0 in relation to the logistic regression analysis (Hair et al., 2010). This process is calculated with SPSS 23, which resulted in two cases being deleted because of a standardised residual higher than 3. The remaining cases fell between 0.07 and -2.59.

4.9.2.3 Kurtosis and Skewness

Use of the maximum likelihood estimation in SEM and logistic regression is done on the theoretical assumption that the dataset follows a normal distribution (Hair et al., 2010). Kurtosis and skewness are two means of examining a dataset's normality. Kurtosis aims to measure the flatness of the dataset's distribution (George and Mallery, 2005). A value close to zero is considered normal in relation to kurtosis. Correspondingly, a positive value is produced from a distribution more peaked than normal and a negative one from one flatter than normal. A value between ±2.0 is generally acceptable. Similarly, skewness is measured according to a deviation from the mean (George and Mallery, 2005; Hair et al., 2010). Just as with kurtosis, ±2.0 is acceptable.

4.9.2.4 Structural Equation Model

SEM is a popular method that follows a confirmatory approach for the analysis of multivariate data. SEM has been adopted for this research principally because it can include latent variables when representing abstract concepts while also taking into account the measurement error and due to its capacity for simultaneously assessing the multiple correlations and covariance among variables in the model validity test (Hair et al., 2010).

Confirmatory factor analysis (CFA) on the measurement model was carried out with AMOS 23 according to the data gathered in the survey. Its aim is to test the capacity of the hypothesised model to reproduce the samples by statistical analysis. This is done in three parts. The model specification process is the first, and involves identification of the set of relationships the researcher wishes to evaluate as well as deciding how to clearly define the constructs within the model. The parameters are

determined to be either fixed or free. The former are not calculated from the data and are generally set at zero, while the latter are calculated from observed data and are anticipated to be non-zero. Once a CFA model is clearly identified, the second part involves creating an iterative model modification process to develop a set of items that best represents a construct through refinement and retesting. This results in putting to one side those items that fail to pass the validity and reliability test. The final part involves calculating the goodness of fit (GOF) statistics of the overall measurement model to check the degree to which the measurement model is supported by the data.

The most used statistics are the likelihood ration chi-square ($\chi 2$), the ratio of $\chi 2$ to degrees of freedom ($\chi 2$/df), the root mean square error of approximation (RMSEA), Goodness of Fit Index (GFI), adjusted GFI (AGFI) and comparative fit index (CFI). Table 4.8 sets out the objectives of the GOF statistics and what are acceptable values for these statistics.

Statistics	Purpose	Threshold
χ^2 (p-value)	Assess the extent to which the data support the hypothesised model	p> 0.05 (α = 0.05)
χ^2/df	Take into account the degrees of freedom	< 5.0
RMSEA	Measure the mean discrepancy between the population estimates from the model and the observed sample values	<0.08
Goodness of Fit Index (GFI)	Independence of sample size	>0.90
Adjusted GFI (AGFI)	Take into account the degrees of freedom available for testing the model	>0.90
Comparative Fit Index (CFI)	Compare the proposed model with the null model	>0.90
Norma Fit Index (NFI)	Fit of the model of independence which estimates variances	>0.90

Table 4-9 GOF Statistics, Purpose and Threshold
Source: Hair et al., 2010

4.9 Reliability and Validity

During the iterative model modification process, an assessment is conducted of the reliability and validity of the constructs. Reliability relates to measuring the consistency of the items in producing reliable results (Chau, 1997), whereas with validity an examination of the degree to which the set of items adequately represents a construct is undertaken. The reliability test includes assessment of items and construct reliabilities. The former (IR) indicates the degree of variation in an item because of the underlying construct rather than an error. This is reviewed through the use of the squared multiple correlation value or the square of the standardised factor loading (FL). An item is stated as reliable if IR is higher than 0.50. The latter, CR, measures the level of consistency between multiple items of a construct. It is tested by calculating Cronbach's alpha (α) coefficients with a desirable threshold of 0.70.

The validity test of the constructs also contains reviews of the convergent validity and the discriminant validity. The latter considers the degree to which the items that measure a construct converge and measure a single construct. This validity assessment has three parts. The first is the calculation of $\chi 2$ values for each of the constructs. Then, if any $\chi 2$ rejects a factor at $p<0.05$, modification indices are employed to establish common factors among items. The final is to put to one side items that do not fit any factor from subsequent analysis. The FL is also calculated in the convergent validity check process. It is generally agreed that the FL should be at a minimum 0.50 and ideally 0.70 or greater and all FLs should be statistically significant. As for discriminant validity, this measures the extent to which the items of theoretically distinct constructs are unique. These measures should correlate little with each other, i.e. a low cross-construct correlation indicates discriminant validity. Such validity can be reviewed by using the average variance extracted (AVE). In order to guarantee discriminant validity, the AVE for each construct should be higher than the squared correlations between the construct and all the other constructs in the model. It can be noted that the questionnaire was pre-tested before its use in the main survey.

The questionnaire was pre-tested by 12 lecturers with PhD qualifications in the field of strategic management, to ensure that the measurement items were understandable and capture the aspects of the constructs. There were a few comments about the pre-

test questionnaire mentioned in relation to demographic profile and the measurements of the other section of the main variables of the research (TMT characteristics, dynamic capabilities, organisational innovation and performance). The comments were taken into consideration. Thereafter, the modified and improved version of the questionnaire was sent to 30 individuals from outside the study sample; the aim of this step was to ensure that the questionnaire was readable and understandable by the participants. The responses to the pilot study included any suggestions or comments to make sure that the questionnaire was comprehensible and the items of the instruments were clear and able to capture the important concepts. As a result, the survey was considered ready for collecting data. Distribution of the survey aimed to achieve one main objective which was to explore and investigate the factors that affect organisational innovation. In doing so, the survey consisted of two sections designed to facilitate achieving the main objective. The first section consisted of questions to collect the demographic information for the participants in order to understand their situation as a team member in the targeted organisations. The second section involved gathering information about the participants' perceptions about the characteristics of TMTs, dynamic capabilities organisational innovation and performance through the items suggested in Tables 4.4, 4.5, 4.6 and 4.7 previously.

In terms of sample size, SEM software was employed to analyse the proposed model. This needed a large sample. The SEM sampling technique is dependent on the number of items in the survey, adopting a ratio of 5 to 10 respondents for each item. Given that the number of items is 38, in order to ensure reliable results, the sample size f should be between 155 and 310. Tabachnich and Fidell (2001) point out the categories of SEM sampling and their perceived validity: 100 participants will give poor results, 200 fair, 300 good; 500 very good, and 1000 or larger excellent.

4.9.1 Reliability Analysis

In order to achieve reliable results from the research, reliability analysis should be undertaken. Hair et al. (2006, p. 137) see reliability as "an assessment of the degree of consistency between multiple measurements of a variable". Moreover, the reliability of a survey instrument can be achieved if the repeated application of the instrument

offers consistent results. Consistency is also possible if an instrument is tested on the same individual at different points. This means that the responses about this internal consistency are usually obtained by calculating the coefficient alpha, known as Cronbach's alpha. The lowest acceptable limit for Cronbach's alpha is 0.70. Churchill argues that "coefficient alpha absolutely should be the first measure one calculates to assess the quality of the instrument" (1979, p. 68). Additionally, the scale of reliability can be checked through "composite reliability". For each of the constructs in the research model, the acceptable value for composite reliability should exceed 0.70.

4.9.2 Validity Analysis

Maitland and Hannah (2008, p. 203) define validity as "the extent to which an instrument accurately measures or predicts what it is supposed to measure or predict". The approaches set out in the subsections below were adopted to review the scale of validity in this phase of the research.

4.10.2.1 Content Analysis

Maitland and Hannah (2008, p. 203) define content validity as "a measure of the extent to which the content of the test measures all of the knowledge or skills that are supposed to be included within the domain being tested, according to expert judges". Five experts in strategic management were consulted in order to establish the content validity of a measuring instrument. Based on their feedback, a number of items were added or deleted from the scale, which included modifying the operational definitions to fit with these changes.

4.10.2.2 Construct Analysis

Maitland and Hannah consider construct validity as "the true measure of accuracy; this involves the extent to which the test actually measures the hypothetical construct or behaviour it is designed to assess" (2008, p. 203). Establishing construct validity by statistical measuring of the item measures chosen from samples can improve the representativeness of the actual true scores present in the population. Every

measurement scale was reviewed through convergent and discriminant validity tests in an effort to establish construct validity of the scales.

4.10.2.3 Convergent Analysis

Hair et al. (2006, p. 771) define convergent validity as "the extent to which indicators of a specific construct converge or share a high proportion of variance in common". Convergent validity is reviewed in this research by examining the following factors: 1) factor loadings, which relate all significant indicators to their respective constructs – all the absolute values of critical ratios (CR) of all the indicators should be higher than 1.96, at the 0.05 level of significance; 2) standardised regression coefficients, which should be greater than 0.50; and 3) the AVE, which shows the general variation in the indicators that are accounted for by the latent construct. Therefore, greater AVE values show that the items are a true representation of the latent construct. An AVE of 0.50 at a minimum offers support for convergent validity.

4.10 Chapter Conclusion

This chapter has presented the research methodology adopted for adequately answering the research questions: What affect do TMT Characteristics have on Performance? What affect do TMT Characteristics have on Organisational Innovation? What affect do TMT Characteristics have on Dynamic Capabilities? What affect do Dynamic Capabilities have on Performance? What affect do Dynamic Capabilities have on Organisational Innovation? What affect does Organisational Innovation have on Performance? and What affect do TMT Characteristics have on Organisational Innovation and Performance via Dynamic Capabilities?

As stated in this chapter, it is proposed to use a mixed method approach with a sequential explanatory design that consists of a survey followed by an interview. In the quantitative phase, a conceptual model as set out in Chapter 3 is to be employed to better understand the mediating role of DCs in the relationship between TMT characteristics, organisational innovation and performance. SEM will be employed to check and validate the conceptual model according to the survey data collected. In the second phase, which is the qualitative one, semi-structured interviews are employed

to further interpret and explain the survey results. The rationale is that the results from the survey will provide a rough sketch of the proposed conceptual framework while the interview will refine those results through the in-depth views of participants.

The following chapter considers data reliability and validity and the use of structural equation modelling to check the research framework.

5 Data Analysis Results and Findings

5.1 Overview of the Chapter

This chapter outlines the structural equation modelling (SEM), scale reliability testing, instrument refinement and validation, Confirmatory Factor Analysis (CFA), overall Model Fit, Convergent Validity and Construct Reliability Analysis and justification for using SEM, SEM procedures and Goodness of Fit Index (GFI) and hypotheses testing for the relationships presented in the conceptual framework.

5.2 Structural Equation Modelling

SEM is a statistical technique used to analyse complex relationships through it exploratory and confirmatory powers which have made it a suitable tool for model testing and development. The exploratory part involves identification of variables into latent constructs and the confirmatory part involves the determining whether the data fits the model and this is achieved with the help of modification fit indices. With confirmatory modelling, the hypothesised relationships are represented in a model and then tested. This test involves the use of the data that has been purify during the exploratory phase of the analysis. Based, on the modification fit indices, continues improvements are being made on the model to improve its fit until the best fit is achieved.

Using initial theories, SEM could be utilised inductively by stipulating a model which corresponds and using the data to give estimates of free parameter values. Frequently, the first hypothesis needs adjusting when new model evidence comes to light. When SEM is used solely for exploration, it is often in the context of exploratory factor analysis.

5.3 Scale Reliability Testing

The measure of internal consistency among the latent variables is achieved by calculating the level of Cronbach alpha for each latent variable as shown in Table 5.1.

Variable name	No. of items	Cronbach's Alpha
Sensing Opportunities Capabilities	4	0.814
Learning Capabilities	5	0.804
Integrating Capability	5	0.884
Coordinating Capability	5	0.784
Dynamic capabilities	19	0.933
Exploitative Innovation	5	0.866
Explorative Innovation	6	0.856
Organisational Innovation	11	0.900
Performance	5	0.887
Total	35	

Table 5-1 Reliability Test for All Measurement Items

The level of Cronbach's alpha above shows that every construct has an acceptable eliability index with the minimum of 0.78. This level of Alpha is higher than the minimum level of 0.60 advanced by (George and Mallery, 2003). The reliability for the all the constructs therefore confirms good level of internal consistency and that the data can produce reliable results.

5.4 Non-Response Bias

The standard way to test for non-response bias is to compare the responses of those who respond to the first mailing of a questionnaire to those who respond to subsequent mailings. Those who return subsequent mailings are, in effect, a sample of non-respondents (to the first mailing), and we assume that they are representative of that group. The sample consisted of 100 respondents from the first mailing, and 92 from the second mailing (see Table 5-2)

Table – Statistical Significance of Differences Between Responses of First and Second Mailings			
Variable	Mean First Mailing	Mean Second Mailing	Statistical Significance
Q24.Top management group increase economies of scales in existing markets	3.21	3.77	0.025
Q31 Top management group in firm are uses	3.26	3.81	0.015

new distribution channels			
Q38 The net profit position relative to our principal competitor is	3.55	3.71	0.011

Table 5-2 Statistical Significance of Differences Between Responses of First and Second Mailings

The questionnaire had total 50 questions out of them only 3 were found to have significantly different means of first mailing and second mailing. The differences are significant however they are slightly different so we can conclude that most of the items do not have statistical difference in the mean response of first mailing respondents and second mailing respondents and moreover only three items had significant difference however the differences are quite small and generally would not affect the overall results. Hence there is no such issue of non-response bias.

5.5 Common Method Bias

Self-reported biasness may be the cause of common method variance (CMV) which may have inflated coefficients (Conway and Lance, 2010). Harman single factor test provides the evaluation process for testing the amount of biasness by a single factor (Yeap, Jasmine and Ramayah, 2016). This procedure involves taking all item in EFA and perform the factor analysis using the fixed number of factors to be one with rotation to be "None". Then by looking at the total variance explained by that single factor < 50% (Podsakoff and Organ, 1986) indicates CMV is not a problem for SEM. The same procedure with is explained above was performed for the present analysis for testing Common method variance or Common method Bias (CMV/CMB) and the result is shown in the following table.

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	16.152	41.809	41.809	16.152	41.809	41.809
2	6.457	16.913	58.726			
3	2.186	8.097	66.823			
4	2.050	6.632	73.455			
5	1.778	5.094	78.517			
6	.914	3.125	81.638			
7	.802	2.166	83.322			

8	.770	2.098	85.321			
9	.521	1.417	86.738			
10	.413	1.142	88.017			
11	.377	1.019	89.035			
12	.336	.935	89.950			
13	.285	.788	90.748			
14	.265	.752	91.510			
15	.259	.689	92.210			
16	.234	.642	92.822			
17	.229	.630	93.442			
18	.214	.568	94.020			
19	.192	.530	94.540			
20	.186	.512	95.042			

Extraction Method: Principal Component Analysis.

Table 5-3 Common Method Bias

The above table of total variance explained shows that variation explained by a single factor is around 41% which is < 50% hence according to Podsakoff and Organ (1986) there is no issue of CMB or CMV (see Table 5-3).

5.6 Validation of Constructs

All the constructs used in the model have been obtained from the review of relevant literature. However, it will be a poor assumption to make that all the variables under each constructs are heavily loaded or have measures what they are intended to measure. In order to validate our data to see what they are actually measuring, the use of CFA was very instrumental. CFA gave a clear picture of what each items in their respective constructs identified in the model. The CFA was run for all variables and the loadings of each variables as per the factors where observed to see if they loaded significantly and also to identify those variables with poor loadings or poor fit. Variables with poor loadings where dropped from the model and factors with eigenvalues less than one where also dropped. While dropping these variables, the model was re-run to improve the model fit and the statistics presented below is a representation of the improved model.

5.7 Confirmatory Factor Analysis (CFA)

CFA is a statistical tool used to explore models that involves both latent and observed variables and therefore used to validate hypothesis that involves such latent constructs (klein, 2010). CFA unlike other models such as regression analysis, provides a details and more complex result of a hypothesized model in a single analysis rather than running a series of regression analysis to test the various hypothesis in the model (Hair et al., 2006). This is the benefit of CFA. Path loadings from a single analysis can be used to explain and refined the model. After all measures have been refined using CFA, the next step is to develop the measurement model. This measurement model confirms all the hypothesised relationships derived from the conceptual framework. After the specification of the model, the refined data is now used to run test the model and the path coefficients are used to explain the hypothesised (Webster and Fisher, 2001).

5.8 Overall Model Fit

Goodness of fit is "the degree to which the actual or observed input matrix (Covariances or correlations) is predicted by the estimated model" (Hair et al., 2006, p. 580). According to Bollen (1989), the $\chi 2$ likelihood ratio test, the Standardised Root Mean Residual (SRMR) and the Goodness-of-Fit Index (GFI, CFI, and IFI) are the most frequently achieved measures. The following sections provide an overview of each of the achieved measures to explain the decisions obtained with regard to the models.

The $\chi 2$ likelihood ratio test, which is highly important as a “badness-of-fit” test, is the most identified and apparent measure correlated with CFA. The proposed model does not meet the requirements of the collected data very precisely if the p-value of $\chi 2$ is significant (i.e., <0.05), whereas it meets the demands of the collected data if a p-value of >0.05 is achieved. According to Byrne (2001), there is a progressing debate on whether a model that has a significant $\chi 2$ statistic must be taken into consideration as valid.

Measuring data through SEM usually takes place by deploying goodness-of-fit (GOF) measures. The CFA contains important functions that may be deployed. These functions involve the following:

i. Examining the loading factors in every dimension/construct in forming a variance,
ii. Confirming that the instruments themselves, how linked the instrument to the latent variables,
iii. Estimating the measurement error in the framework, and
iv. Validating and generated framework.

Therefore, CFA is most often deployed to determine whether the set of factors and the loading of construct items confirm the expected requirements that are needed to measure what i really measures on the scale itself.

The Researcher used Amos version 23.0 in this research. For measuring the exogenous variables and endogenous variables, there are many key terms of SEM such as Absolute fit index, Incremental Fit Level and Parsimonious Fit Level as shown in Table 5.4.

Measures	Threshold Values
Absolute Fit Level	
RMSEA	Less than 0.08
GFI	0.90 and Above
P- Value	*P*- Value ≥0.05
Incremental Fit Level	
AGFI	0.90 and Above
CFI	0.90 and Above
TLI	0.90 and Above
NFI	0.90 and Above
Parsimonious Fit Level	
CMIN/df	Less than 5.0
SMC (R^2)	Bigger better

Table 5-4 Recommendation Values of Measurements for All Exogenous and Endogenous Variables
Source: Hair et al., 2006

According to Byrne (2001), structural equation modelling can be divided into two sections namely the measurement and the structural model. The measurement model measures the relationship between the observed and the latent variables. Likewise, the structural model can measure the relationship between unobserved variables.

According to Hair et al. (2006, p. 753), as shown in Table 5.4 above, the recommendation values of fit model are as follow:

i. Absolute Fit Index (AFI) assesses whether a specific model leaves appreciable unexplained variance. Alkhaldi and Al-Faoury (2007), indicate that measures such as Chi-square ($\chi 2$) accompanied by the model's degree of freedom and its probability, goodness of fit index (GFI), and the root mean square error of approximation (RMSEA) are usually utilized here. As following: RMESA <0.08, GFI > 0.90, P-value > 0.05.

ii. Incremental Fit Index (IFI) compares the (Generating Model (GM)) specific model to possible baseline or null models estimated using the same data. Indices such as the Tucker-Lewis index (TLI), comparative fit index (CFI), and the incremental fit index (IFI) are commonly used GFI > 0.90, CFI > 0.90, TLI >0.90, NFI >0.90.

iii. Parsimonious Fit Index (PFI) is also called an adjusted measure, and asks how well the model measures both fit and parsimony, taking into account the degree of freedom used in the model specification. Indices such as Normed fit index (the adjusted chi –square by the degree of freedom) can be used CMIN/df < 5, SMC (R^2) >0.00.

The main part of this section is to investigate and examine the relationships between exogenous and endogenous variables. Firstly, the Researcher measured the individual variable related to the measurement model.

5.9 Confirmatory Factor Analysis (Measurement Model)

5.9.1 Confirmatory Factor Analysis (Full measurement model)

The initial measurement model was run with total 50 items for 11 constructs including 4 constructs as TMT characteristics {Age, Education Level, Tenure Diversity and Functional Experience "3 items Each"}, 4 constructs for Dynamic Capabilities {Opportunities Capability "4 items", Learning Capability "5 items", Integrating Capability "5 items" and Coordinating Capability "5 items"}, 2 constructs for Organizational Innovation {Exploitative Innovation and Explorative Innovation "6 items each} and 1 construct for Performance "7 items". The initial full measurement model (CFA) in shown below.

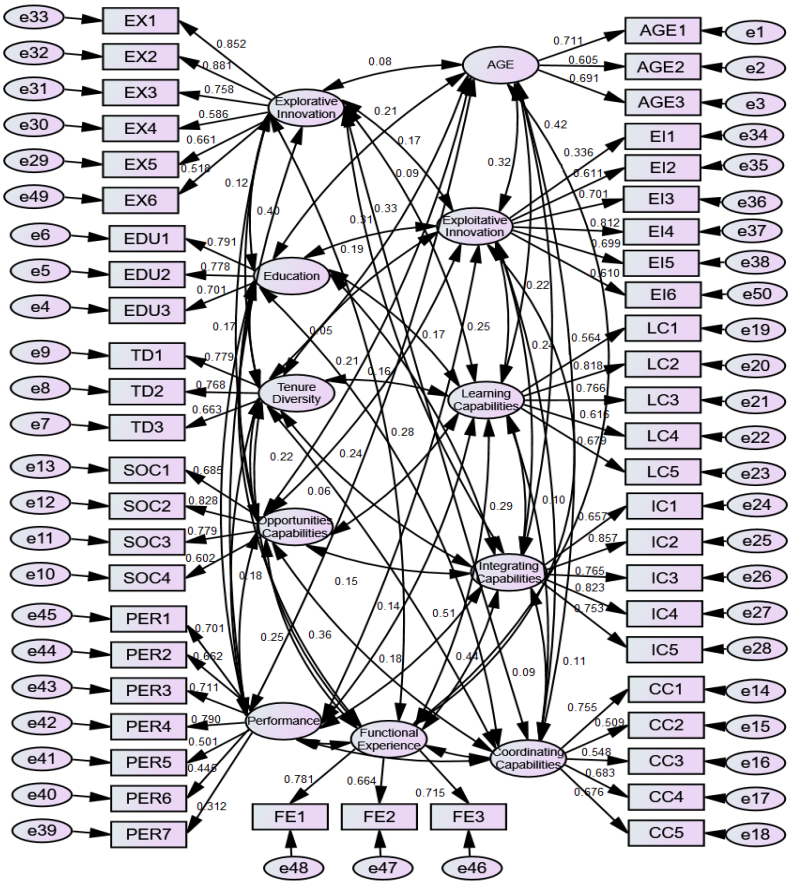

Figure 5-1 Initial full measurement model with 50 items

5.9.1.1 Standardized Loadings of the Items included in Initial Measurement Model

The CFA model was conducted for the constructs. The Table below shows the items from the model. The threshold of factor loading is 0.5 (hair et al 2012). The loading for all the items included in the model is shown in the table below.

Table 5-5 Loadings for all 50 items included in the initial measurement model

Construct	Items	Estimate
Age	AGE1	0.711
	AGE2	0.605
	AGE3	0.691
Education	EDU1	0.791
	EDU2	0.778
	EDU3	0.701
Tenure Diversity	TD1	0.779
	TD2	0.768
	TD3	0.663
Functional Experience	FE1	0.781
	FE2	0.664
	FE3	0.715
Opportunities Capabilities	OC1	0.685
	OC2	0.828
	OC3	0.779
	OC4	0.602
Learning Capabilities	LC1	0.564
	LC2	0.818
	LC3	0.766
	LC4	0.616
	LC5	0.679
Integrating Capabilities	IC1	0.657
	IC2	0.857
	IC3	0.765
	IC4	0.823
	IC5	0.753
Coordinating Capabilities	CC1	0.755
	CC2	0.509
	CC3	0.548
	CC4	0.683

	CC5	0.676
Exploitative Innovation	~~EI1~~	~~0.336~~
	EI2	0.611
	EI3	0.701
	EI4	0.812
	EI5	0.699
	EI6	0.610
Explorative Innovation	EX1	0.852
	EX2	0.881
	EX3	0.758
	EX4	0.586
	EX5	0.661
	EX6	0.518
Performance	PER1	0.701
	PER2	0.662
	PER3	0.711
	PER4	0.790
	PER5	0.501
	~~PER6~~	~~0.445~~
	~~PER7~~	~~0.312~~

Table 5-6 Loadings for all 50 items included in the initial measurement model

The above table shows the item EI1 having the loading 0.336. This item has loading below the threshold level of 0.5 hence it was decided to remove it. Moreover the loadings for items PER6 and PER7 were 0.445 and 0.312 respectively and these items were also decided to be deleted. Hence the model was run again after removing these items and hence the modified model had 47 items. The modified model is presented in the figure below.

5.9.2 Confirmatory Factor Analysis (Modified Measurement Model)

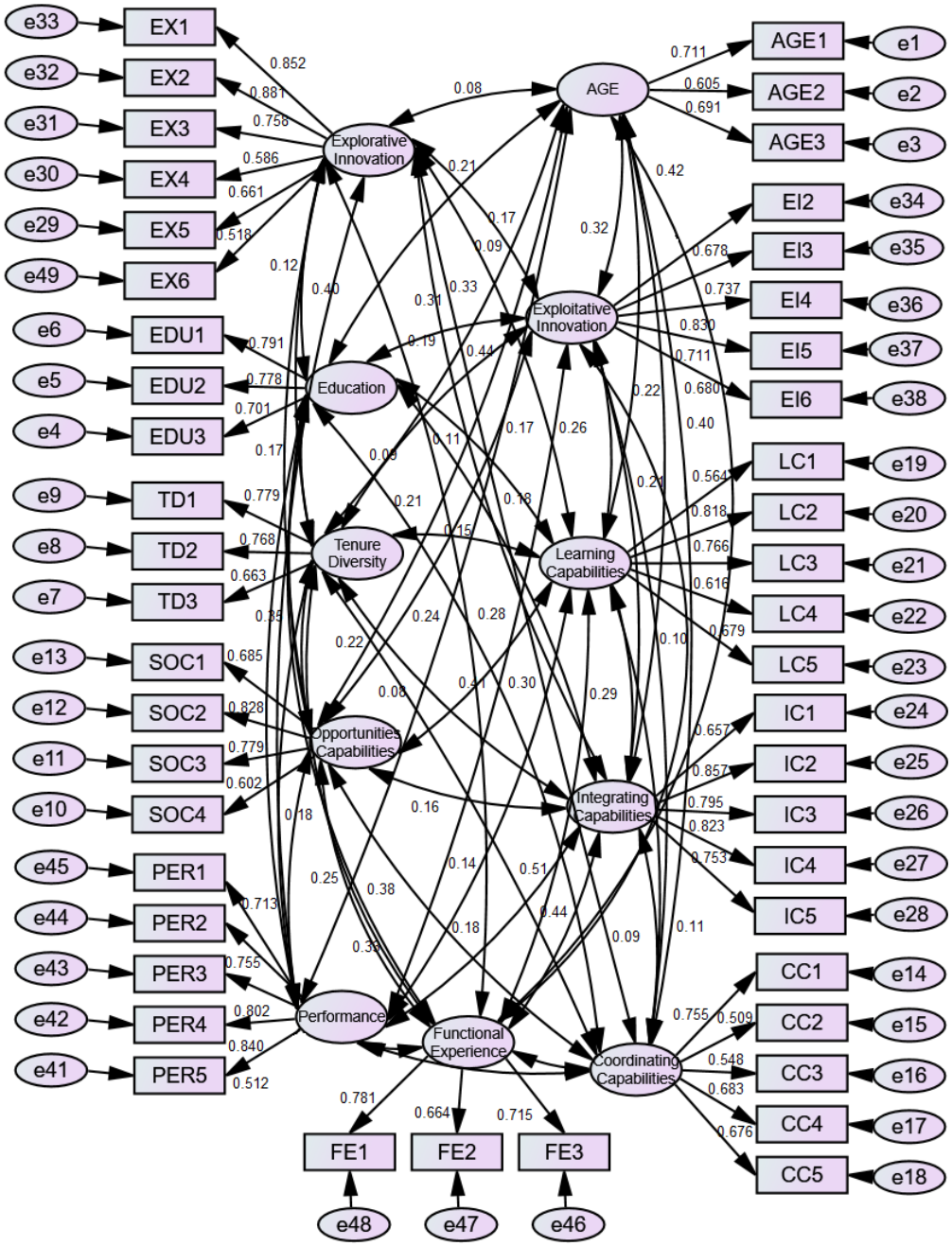

Figure 5-2 Modified Measurement Model with 47 items

The loadings for the remaining 47 items are shown below in the table.

Construct	Items	Estimate
Age	AGE1	0.711
	AGE2	0.605
	AGE3	0.691
Education	EDU1	0.791
	EDU2	0.778

	EDU3	0.701
Tenure Diversity	TD1	0.779
	TD2	0.768
	TD3	0.663
Functional Experience	FE1	0.781
	FE2	0.664
	FE3	0.715
Opportunities Capabilities	OC1	0.685
	OC2	0.828
	OC3	0.779
	OC4	0.602
Learning Capabilities	LC1	0.564
	LC2	0.818
	LC3	0.766
	LC4	0.616
	LC5	0.679
Integrating Capabilities	IC1	0.657
	IC2	0.857
	IC3	0.765
	IC4	0.823
	IC5	0.753
Coordinating Capabilities	CC1	0.755
	CC2	0.509
	CC3	0.548
	CC4	0.683
	CC5	0.676
Exploitative Innovation	EI2	0.678
	EI3	0.737
	EI4	0.830
	EI5	0.711
	EI6	0.680
Explorative Innovation	EX1	0.852

	EX2	0.881
	EX3	0.758
	EX4	0.586
	EX5	0.661
	EX6	0.518
Performance	PER1	0.713
	PER2	0.755
	PER3	0.802
	PER4	0.840
	PER5	0.512

Table 5-7 The loadings for the remaining 47 items are shown below in the table.

The above table shows that the loadings for all remaining 47 items. The loadings for all items shows that all items are above the threshold level. Hence the remaining all 47 items are kept for the further analysis.

5.9.2.1 Goodness of Fit Indices

The results regarding the measurement model indicated fit indices. The commonly used GOF indices are p-value, χ^2/df, CFI, and RMSEA. All these indices met the acceptable value and exceed the threshold for the SEM analysis. All the value for the fit indices for both initial and final model are shown in the table below.

Fit index	Modified Model	Recommended values	Source
CMIN (χ^2)	980.881		
p-value	0.000	> 0.05	Forza & Filippini (1998)
χ^2/df	2.178	≤ 5.00	Bagozzi and Yi (1988)
GFI	0.901	≥ 0.90	Forza & Filippini (1998)
AGFI	0.821	≥ 0.80	Chau and Hu (2001)
CFI	0.977	≥ 0.90	Bagozzi and Yi (1988); Byrne, 1998
TLI	0.966	≥ 0.90	Hair et al., (2006); Ho, (2006)
IFI	0.968	≥ 0.90	Hair et al., (2006); Ho, (2006)
RMSEA	0.021	≤ 0.10	Schumacker and Lomax, 2010

Table 5-8 Fit Indices for Measurement Model

The results of the Goodness of fit indices showed that the chi-square is significant at 0.000 level. However, the absolute fit index of minimum discrepancy chi-square can be ignored if the sample size obtained for the study is greater than 200 (Hair Jr, Anderson, Tatham, & William, 1995; Joreskog & Sorbom, 1984). The GFI was 0.901 which was above the cut-off 0.8 as recommended by Forza & Filippini (1998). After adjustment for the degrees of freedom relative to the number of variables, the adjusted GFI (AGFI) was 0.821 which was above the cut-off point of 0.80 as recommended by Chau and Hu (2001). It indicated that the model predicts 82.1% of the variances and covariance in the survey data. Based on the CFI, TLI, and IFI indices with values more than the cut off value of 0.9 (0.977, 0.966 and 0.968 respectively), the model had good fit of data (Bagozzi and Yi., 1988; Byrne., 1998; Hair et al., 2006; Ho., 2006). Further, the root-mean-square error of approximation (RMSEA) was 0.021 which was below the threshold 0.1 as recommended by Schumacker and Lomax (2010). Additionally, the Relative CMIN/df was 2.178 which was less than 5 showed the good fit of the model (Bagozzi and Yi., 1988). Given that the modified CFA model for the study fits the data adequately, no further adjustments are required.

5.9.2.2 Convergent Validity Analysis and Construct Reliability

CONSTRUCS	**ITEMS**		**Convergent validity**

		CRONBACH'S ALPHA	Final Factor Loading	Average Variance Extracted (AVE)[a]	Composite Reliability (CR)[b]
Age	AGE1	0.781	0.711	0.836	0.962
	AGE2		0.605		
	AGE3		0.691		
Education	EDU1	0.774	0.791	0.934	0.983
	EDU2		0.778		
	EDU3		0.701		
Tenure Diversity	TD1	0.715	0.779	0.817	0.852
	TD2		0.768		
	TD3		0.663		
Functional Experience	FE1	0.815	0.781	0.837	0.969
	FE2		0.664		
	FE3		0.715		
Opportunities Capabilities	OC1	0.821	0.685	0.863	0.974
	OC2		0.828		
	OC3		0.779		
	OC4		0.602		
Learning Capabilities	LC1	0.789	0.564	0.841	0.883
	LC2		0.818		
	LC3		0.766		
	LC4		0.616		
	LC5		0.679		
Integrating Capabilities	IC1	0.779	0.657	0.865	0.962
	IC2		0.857		
	IC3		0.765		
	IC4		0.823		
	IC5		0.753		
Coordinating Capabilities	CC1	0.811	0.755	0.850	0.966

	CC2		0.509		
	CC3		0.548		
	CC4		0.683		
	CC5		0.676		
Exploitative Innovation	EI2	0.801	0.678	0.890	0.976
	EI3		0.737		
	EI4		0.830		
	EI5		0.711		
	EI6		0.680		
Explorative Innovation	EX1	0.791	0.852	0.827	0.975
	EX2		0.881		
	EX3		0.758		
	EX4		0.586		
	EX5		0.661		
	EX6		0.518		
Performance	PER1	0.785	0.713	0.877	0.913
	PER2		0.755		
	PER3		0.802		
	PER4		0.840		
	PER5		0.512		

Table 5-9 Convergent Validity

In this case, all the criteria were within acceptable limits and thus confirmed the convergent validity by calculation of the AVE and construct reliability by calculation of the CR. From Table, the values of the AVE for constructs within the measurement model should be greater than 0.50 as recommended by Malhotra and Stanton (2004) who explained that AVE should be greater than 0.50 to validate employing a construct. In addition, a CR index for constructs within the measurement model greater than 0.70 indicates satisfactory internal consistency as recommended by Hair et al. (2006).

This section has presented the scale reliability testing, instrument refinement and validation, Confirmatory Factor Analysis (CFA), overall Model Fit, Convergent Validity and Construct Reliability Analysis and justification for quantitative analysis and hypothesis testing through using Structural Equation Modelling.

The next section presents the structural model this phase of structural equation model allows to test the significance of the hypotheses. Hence this part will let us know the results of hypotheses testing.

5.10 Hypothesis Testing

The earlier section has discussed measurement model. In this section, the results of the analysis are therefore presented in line with the hypothesised relationship from the conceptual framework. This presentation will consist of both the direct and indirect effects of the dependent and independent variable taken into consideration the significant of the path coefficient along with the p-values.

5.10.1 Top Management Team Characteristics → Performance

In terms of the impact of TMT characteristics and performance, the following hypotheses were tested.

H1: Top Management Team Characteristics have a direct positive effect on firm performance.

From this were derived the following sub-hypotheses:

H1-1: Average Age of TMT Members have a direct positive effect on firm performance

Hypothesis	Regression Weights		Estimate	SE	CR	P value	Result
	From	To					
H1-1	AATM	Performance	0.039	0.039	1.000	0,316	Rejected

Table 5-10 Direct Hypotheses Testing Result (Average Age of TMT Members Performance)

The result presented in table 6.1 above (β = 0.039, C.R = 1.000; P-value = 0.316) shows the direct positive effect of average age of TMT members on firm performance is is not supported and therefore H1-1 is rejected.

H1-2: Educational Level have a direct positive effect on firm performance

Hypothesis	Regression Weights		Estimate	SE	CR	P value	Result
	From	To					
H1-2	EL	Performance	0.669	0.039	17.153	***	Accepted

Table 5-11 Direct Hypotheses Testing Result (Educational Level Performance)

From the above statistics (β = 0.669, C.R = 17.153; P-value = ***), the direct positive effect of education level on firm performance (H1-2) is supported.

H1-3: Tenure Diversity / Heterogeneity have a direct positive effect on firm performance

Hypothesis	Regression Weights		Estimate	SE	CR	P value	Result
	From	To					
H1-3	TDH	Performance	0.739	0.035	21.114	***	Accepted

Table 5-12 Direct Hypotheses Testing Result (Tenure Diversity / Heterogeneity Performance)

The parameters presented in table 6.3 above (β = 0.739, C.R = 21.114; P-value = ***) suggest the direct positive effect of Tenure Diversity / Heterogeneity on firm performance (H1-3) is supported.

H1-4: Functional Experience have a direct positive effect on firm performance

Hypothesis	Regression Weights		Estimate	SE	CR	P value	Result
	From	To					
H1-4	FE	Performance	0.609	0.032	30.450	***	Accepted

Table 5-13 Direct Hypotheses Testing Result (Functional Experience Performance)

The parameters from table 6.4 (β = 0.609, C.R = 30.450; P-value = ***) suggest functional experience has a positive direct effect on firm performance and therefore H1- 4 is supported.

5.10.2 Top Management Team Characteristics → Organisational Innovation

H3: Top Management Team Characteristics have a direct positive effect on Organisational Innovation.

From this were derived the following sub-hypotheses:

H3-1: Top Management Team Characteristics (Average Age of TMT Members, Educational Level, Tenure Diversity / Heterogeneity and Functional Experience) have a direct positive effect on Exploitative Innovation

Hypothesis	Regression Weights		Estimate	SE	CR	P value	Result
	From	To					
H2-1	AATM	exploitative	0.073	0.070	1.042	0.304	Rejected
	EL	exploitative	0.573	0.043	13.325	***	Accepted
	TDH	exploitative	0.373	0.063	5.920	***	Accepted
	FE	exploitative	0.433	0.058	7.465	***	Accepted

Table 5-14 Direct Hypotheses Testing Result (Top Management Team Characteristics Exploitative Innovation)

From table 6.5 above, Average Age of TMT Members does not have a positive direct effect on Exploitative Innovation (β = 0.073, CR = 1.042; P-value = 0.304). Educational Level has a positive direct effect on Exploitative Innovation (β = 0.758, CR = 13.325; P-value = ***). Tenure Diversity / Heterogeneity has a positive direct effect on Exploitative Innovation (β = 0.373, CR = 5.920; P-value = ***). Functional Experience has a positive direct effect on Exploitative Innovation (β = 0.433, CR = 7.465; P-value = ***).

H3-2: Top Management Team Characteristics (Average Age of TMT Members, Educational Level, Tenure Diversity / Heterogeneity and Functional Experience) have a direct positive effect on Explorative Innovation

Hypothesis	Regression Weights		Estimate	SE	CR	P value	Result
	From	To					
H2-2	AATM	explorative	0.071	0.043	1.651	0.095	Rejected
	EL	explorative	0.615	0.028	21.964	***	Accepted
	TDH	explorative	0.618	0.032	19.312	***	Accepted
	FE	explorative	0.673	0.026	25.884	***	Accepted

Table 5-15 Direct Hypotheses Testing Result (Top Management Team Characteristics Explorative Innovation)

From table 6.6 above, Average Age of TMT Members does not have a direct positive effect on Explorative Innovation (β = 0.071, CR = 1.651; P-value = 0.095). Educational Level has a direct positive effect on Explorative Innovation (β = 0.615, CR = 21.964; P-value = ***). Tenure Diversity / Heterogeneity has a direct positive effect on Explorative Innovation (β = 0.618, CR = 19.312; P-value = ***). Functional Experience has a direct positive effect on Explorative Innovation (β = 0.673, CR = 25.884; P-value = ***).

5.10.3 Top Management Team Characteristics → Dynamic Capability

H3: Top Management Team Characteristics (Average Age of TMT Members, Educational Level, Tenure Diversity / Heterogeneity and Functional Experience) have a direct positive effect on Dynamic Capability.

Hypothesis	Regression Weights		Estimate	SE	CR	P value	Result
	From	To					
H3	AATM	DC	-0.025	0.086	-0.0343	0.732	Rejected
	EL	DC	0.284	0.034	8.352	***	Accepted
	TDH	DC	0.339	0.041	8.268	***	Accepted
	FE	DC	0.313	0.060	5.217	***	Accepted

Table 5-16 Direct Hypotheses Testing Result (Top Management Team Characteristics Dynamic Capability)

The result in table 6.7 above shows that, Average Age of TMT Members does not have a direct positive effect on Dynamic Capability (β = -0.025, CR = -0.0343; P-value = 0.732). Educational Level has a direct positive effect on Dynamic Capability (β = 0.284, CR = 8.352; P-value = ***). Tenure Diversity / Heterogeneity has a positive direct effect on Dynamic Capability (β = 0.339, CR = 8.268; P-value = ***). Functional Experience has a direct positive effect on Dynamic Capability (β = 0.313, CR = 5.217; P-value = ***).

From this were derived the following sub-hypotheses:

H3-1: Top Management Team Characteristics (Average Age of TMT Members, Educational Level, Tenure Diversity / Heterogeneity and Functional Experience) will have a direct positive effect on Sensing Opportunities Capability

Hypothesis	Regression Weights		Estimate	SE	CR	P value	Result
	From	To					
H3-1	AATM	SOC	0.092	0.065	1.415	0.352	Rejected
	EL	SOC	0.260	0.060	4.333	0.005	Accepted
	TDH	SOC	0.266	0.062	4.290	0.002	Accepted
	FE	SOC	0.279	0.054	5.167	***	Accepted

Table 5-17 Direct Hypotheses Testing Result (Top Management Team Characteristics Sensing Opportunities Capability)

The parameters in table 6.8 shows that, Average Age of TMT Members does not have a direct positive effect on Sensing Opportunities Capability (β = 0.092, CR = 1.415; P-value = 0.352). Educational Level has a direct positive effect on Sensing Opportunities Capability (β = 0.260, CR = 4.333; P-value = 0.005). Tenure Diversity / Heterogeneity has a positive direct effect on Sensing Opportunities Capability (β = 0.266, CR = 4.290; P-value = 0.002). Functional Experience has a direct positive effect on Sensing Opportunities Capability (β = 0.279, CR = 5.167; P-value = ***).

H3-2: Top Management Team Characteristics (Average Age of TMT Members, Educational Level, Tenure Diversity / Heterogeneity and Functional Experience) will have a direct positive effect on Learning Capability

Hypothesis	Regression Weights		Estimate	SE	C.R.	P value	Result
	From	To					
H3-2	AATM	LC	0.068	0.064	1.063	0.497	Rejected
	EL	LC	0.268	0.061	4.393	0.003	Accepted
	TDH	LC	0.175	0.059	2.966	0.061	Rejected
	FE	LC	0.308	0.053	5.811	***	Accepted

Table 5-18 Direct Hypotheses Testing Result (Top Management Team Characteristics Learning Capability)

The result also for table 6.9 above shows, Average Age of TMT Members does not have a direct positive effect on Learning Capability (β = 0.068, CR = 1.063; P-value = 0.497). Educational Level has a direct positive effect on Learning Capability (β = 0.268, CR = 4.393; P-value = 0.003). Tenure Diversity / Heterogeneity does not have a direct positive effect on Learning Capability (β = 0.175, CR = 2.966; P-value = 0.061). Functional Experience has a direct direct effect on Learning Capability (β = 0.308, CR = 5.811; P-value = ***).

H3-3: Top Management Team Characteristics (Average Age of TMT Members, Educational Level, Tenure Diversity / Heterogeneity and Functional Experience) have a direct positive effect on Integrating Capability.

Hypothesis	Regression Weights		Estimate	SE	CR	P value	Result
	From	To					
H3-3	AATM	IC	0.070	0.068	1.030	0.462	Rejected
	EL	IC	0.163	0.074	2.203	0.110	Rejected
	TDH	IC	0.238	0.070	3.400	0.009	Accepted
	FE	IC	0.300	0.061	4.918	***	Accepted

Table 5-19 Direct Hypotheses Testing Result (Top Management Team Characteristics Integrating Capability)

As shown in table 6.,above 10 Average Age of TMT Members does not have a direct positive effect on Integrating Capability (β = 0.070, CR = 1.030; P-value = 0.462). Educational Level does not have a direct positive effect on Integrating Capability (β = 0.163, CR = 2.203; P-value = 0.110). Tenure Diversity / Heterogeneity has a direct positive effect on Integrating Capability (β = 0.238, CR = 3.400; P-value = 0.009). Functional Experience has a direct positive effect on Integrating Capability (β = 0.300, CR = 4.918; P-value = ***).

H3-4: Top Management Team Characteristics (Average Age of TMT Members, Educational Level, Tenure Diversity / Heterogeneity and Functional Experience) have a direct positive effect on Coordinating Capability

Hypothesis	Regression Weights		Estimate	SE	CR	P value	Result
	From	To					
H3-4	AATM	CC	0.071	0.060	1.183	0.460	Rejected
	EL	CC	0.209	0.063	3.317	0.022	Accepted
	TDH	CC	0.203	0.055	3.691	0.020	Accepted
	FE	CC	0.257	0.066	3.894	0.013	Accepted

Table 5-20 Direct Hypotheses Testing Result (Top Management Team Characteristics Coordinating Capability)

In table 6.11 above, Average Age of TMT Members does not have a direct positive effect on Coordinating Capability (β = 0.071, CR = 1.183; P-value = 0.460). Educational Level has a direct positive effect on Coordinating Capability (β = 0.209, CR = 3.317; P-value = 0.022). Tenure Diversity / Heterogeneity has a direct positive effect on Coordinating Capability (β = 0.203, CR = 3.691; P-value = 0.020). Functional Experience has a direct positive effect on Coordinating Capability (β = 0.257, CR = 3.894; P-value = 0.013).

5.10.4 Dynamic Capability → Organisational Innovation

H4: Dynamic Capability (Sensing Opportunities Capability, Learning Capability, Integrating Capability and Coordinating Capability) has a direct positive effect on Organisational Innovation.

Hypothesis	Regression Weights		Estimate	SE	C.R.	P value	Result
	From	To					
H4	SOC	OI	0.510	0.054	9.444	***	Accepted
	LC	OI	0.314	0.069	4.551	***	Accepted
	IC	OI	0.253	0.063	4.016	0.002	Accepted
	CC	OI	0.062	0.067	0.925	0.536	Rejected

Table 5-21 Direct Hypotheses Testing Result (Dynamic Capability Organisational Innovation)

The statistics presented in table 6.12 above shows, Sensing Opportunities Capability has a direct positive effect on Organisational Innovation (β = 0.510, CR = 9.444; P-value = ***). Learning Capability has a direct positive effect on Organisational Innovation (β = 0.314, CR = 4.551; P-value = ***). Integrating Capability has a direct positive effect on Organisational Innovation (β = 0.253, CR = 4.016; P-value = 0.002). Coordinating Capability does not have a direct positive effect on Organisational Innovation (β = 0.062, CR = 0.925; P-value = 0.536).

From this were derived the following sub-hypotheses:

H4-1: Dynamic Capability (Sensing Opportunities Capability, Learning Capability, Integrating Capability and Coordinating Capability) has a direct positive effect on Exploitative Innovation.

Hypothesis	Regression Weights		Estimate	SE	CR	P value	Result
	From	To					
H4-1	SOC	exploitative	0.290	0.080	3.625	***	Accepted
	LC	exploitative	0.266	0.103	2.582	0.012	Accepted
	IC	exploitative	0.209	0.093	2.247	0.032	Accepted
	CC	exploitative	0.075	.1000	0.750	0.524	Rejected

Table 5-22 Direct Hypotheses Testing Result (Dynamic Capability □ Exploitative Innovation)

The statistics in table 6.13 above reveals that Sensing Opportunities Capability has a direct positive effect on Exploitative Innovation (β = 0.290, CR = 3.625; P-value = ***). Learning Capability has a direct positive effect on Exploitative Innovation (β = 0.266, CR = 2.582; P-value = 0.012). Integrating Capability has a direct positive effect on Exploitative Innovation (β = 0.209, CR = 2.247; P-value = 0.032). Coordinating Capability does not have a direct positive effect on Exploitative Innovation (β = 0.075, CR = 0.750; P-value = 0.524).

H4-2: Dynamic Capability (Sensing Opportunities Capability, Learning Capability, Integrating Capability and Coordinating Capability) has a direct positive effect on Explorative Innovation.

Hypothesis	Regression Weights		Estimate	SE	CR	P value	Result
	From	To					
H4-2	SOC	explorative	0.583	0.056	10.411	***	Accepted
	LC	explorative	0.273	0.072	3.792	0.002	Accepted
	IC	explorative	0.226	0.066	3.424	0.005	Accepted
	CC	explorative	0.032	0.070	0.457	0.741	Accepted

Table 5-23 Direct Hypotheses Testing Result (Dynamic Capability Explorative Innovation)

In table 6.14 above, Sensing Opportunities Capability has a direct positive effect on Explorative Innovation (β = 0.583, CR = 10.411; P-value = ***). Learning Capability has a direct positive effect on Explorative Innovation (β = 0.273, CR = 3.792; P-value = 0.002). Integrating Capability has a direct positive effect on Explorative Innovation (β = 0.226, CR = 3.424; P-value = 0.005). Coordinating Capability does not have a direct positive effect on Explorative Innovation (β = 0.032, CR = 0.457; P-value = 0.741).

5.10.5 Dynamic Capability → Performance

H5: Dynamic Capability (Sensing Opportunities Capability, Learning Capability, Integrating Capability and Coordinating Capability) has a direct positive effect on firm performance

Hypothesis	Regression Weights		Estimate	SE	CR	P value	Result
	From	To					
H5	SOC	Performance	0.424	0.069	6.145	***	Accepted
	LC	Performance	0.249	0.090	2.767	0.011	Accepted
	IC	Performance	0.289	0.082	3.524	0.001	Accepted
	CC	Performance	0.088	0.087	1.011	0.416	Rejected

Table 5-24 Direct Hypotheses Testing Result (Dynamic Capability Performance)

From table 6.15 above, Sensing Opportunities Capability has a positive direct effect on firm performance (β = 0.424, CR = 6.145; P-value = ***). Learning Capability has a direct positive effect on firm performance (β = 0.249, CR = 2.767; P-value = 0.011). Integrating Capability has a direct positive effect on firm performance (β = 0.289, CR = 3.524; P-value = 0.001). Coordinating Capability does not have a direct positive effect on firm performance (β = 0.088, CR = 1.011; P-value = 0.416).

5.10.6 Organisational Innovation → Performance

H6: Organisational Innovation (Exploitative Innovation and Explorative Innovation) will have a direct positive effect on Performance

Hypothesis	Regression Weights		Estimate	SE	CR	P value	Result
	From	To					
H6	exploitative	Performance	0.262	0.036	7.278	0.001	Accepted
	explorative	Performance	0.256	0.040	6.400	0.001	Accepted

Table 5-25 Direct Hypotheses Testing Result (Organisational Innovation Performance)

The statistics from table 6.16 above shows, Exploitative Innovation has a direct positive effect on firm performance (β = 0.262, CR = 7.278; P-value = 0.001). Explorative Innovation has a direct positive effect on firm performance (β = 0.256, CR = 6.400; P-value = 0.001).

5.10.7 TMT Characteristics → Dynamic Capability → Organisational Innovation

H7: Dynamic Capability will mediate the relationship between TMT Characteristics and Organisational Innovation

From this were derived the following sub-hypotheses:

H7-1: Dynamic Capability will mediate the relationship between Average Age of TMT Members and Organisational Innovation

Hypothesis	From	Mediation	To	Direct effect			P value	Indirect effect	SMC (R^2)
				From	To	Value			
H7-1	AATM	DC	OI	AATM	OI	0.069	0.134	-0.019	DC = 0.001
				AATM	DC	-0.025	0.732		OI = 0.600
				DC	OI	0.773	***		

Table 5-26 Mediates the Dynamic Capability between Average Age of TMT Members and Organisational Innovation

Regarding Table 6.17 the Dynamic Capability unmediates the relationship between TMT Members and Organisational Innovation with a value of-0.019; thus H7-1 is not supported.

H7-2: Dynamic Capability will mediate the relationship between Educational Level of TMT Members and Organisational Innovation

Hypothesis	From	Mediation	To	Direct effect			P value	Indirect effect	SMC (R^2)
				From	To	Value			
H7-2	EL	DC	OI	EL	OI	0.101	0.013	0.298	DC = 0.402
				EL	DC	0.421	***		OI = 0.608
				DC	OI	0.707	***		

Table 5-27 Mediates the Dynamic Capability between Educational Level and Organisational Innovation

Regarding Table 6.18, the mediation effect of Dynamic Capability on the relationship between Educational Level and Organisational Innovation (H7-2) was supported.

H7-3: Dynamic Capability will mediate the relationship between Tenure Diversity / Heterogeneity of TMT Members and Organisational Innovation

Hypothesis	From	Mediation	To	Direct effect			P value	Indirect effect	SMC (R^2)
				From	To	Value			
H7-3	TDH	DC	OI	TDH	OI	0.187	0.001	0.406	DC = 0.384
				TDH	DC	0.619	***		OI = 0.617
				DC	OI	0.656	***		

Table 5-28 Mediates the Dynamic Capability between Tenure Diversity / Heterogeneity and Organisational Innovation

Regarding Table 6.19, Dynamic Capability mediates the relationship between Tenure Diversity / Heterogeneity and Organisational Innovation with a value of 0.406; thus H7-3 is supported.

H7-4: Dynamic Capability will mediate the relationship between Functional Experience of TMT Members and Organisational Innovation

Hypothesis	From	Mediation	To	Direct effect			P value	Indirect effect	SMC (R^2)
				From	To	Value			
H7-4	FE	DC	OI	FE	OI	0.172	0.005	0.316	DC = 0.464
				FE	DC	0.681	***		OI = 0.611
				DC	OI	0.655	***		

Table 5-29 Mediates the Dynamic Capability between Functional Experience and Organisational Innovation

Regarding Table 6.20, Dynamic Capability mediates the relationship between Functional Experience and Organisational Innovation with a value of 0.316; thus H7-4 is supported.

5.10.8 TMT Characteristics → Dynamic Capability → Performance

H8: Dynamic Capability mediate the relationship between TMT Characteristics and firm Performance

From this were derived the following sub-hypotheses:

H8-1: Dynamic Capability will mediate the relationship between Average Age of TMT Members and firm performance

Hypothesis	From	Mediation	To	Direct effect			P value	Indirect effect	SMC (R^2)
				From	To	Value			
H8-1	AATM	DC	OI	AATM	Per	-0.025	0.732	-0.026	DC = 0.001
				AATM	DC	0.018	0.717		Per = 0.530
				DC	Per	0.728	***		

Table 5-30 Mediates the Dynamic Capability between Average Age of TMT Members and Performance

Regarding Table 6.21, Dynamic Capability unmediates the relationship between Average Age of TMT Members and firm Performance with a value of -0.026; thus H8-1 is not supported.

H8-2: Dynamic Capability will mediate the relationship between Educational Level of TMT Members and Performance

Hypothesis	From	Mediation	To	Direct effect			P value	Indirect effect	SMC (R^2)
				From	To	Value			
H8-2	EL	DC	OI	EL	Per	0.152	0.016	0.326	DC = 0.402
				EL	DC	0.634	***		Per = 0.543
				DC	Per	0.631	***		

Table 5-31 Mediates the Dynamic Capability between Educational Level and Performance

Regarding Table 6.22, Dynamic Capability mediates the relationship between Educational Level and firm Performance with a value of 0.326; thus H8-2 is supported.

H8-3: Dynamic Capability will mediate the relationship between Tenure Diversity / Heterogeneity of TMT Members and Performance

Hypothesis	From	Mediation	To	Direct effect			P value	Indirect effect	SMC (R^2)
				From	To	Value			
H8-3	TDH	DC	OI	TDH	Per	0.135	0.031	0.342	DC = 0.384
				TDH	DC	0.619	***		Per = 0.541
				DC	Per	0.644	***		

Table 5-32 Mediates the Dynamic Capability between Tenure Diversity / Heterogeneity and Performance

Regarding Table 6.23, Dynamic Capability mediates the relationship between Tenure Diversity / Heterogeneity and Performance with a value of 0.342; thus H8-3 is supported.

H8-4: Dynamic Capability will mediate the relationship between Functional Experience of TMT Members and Performance

Hypothesis	From	Mediation	To	Direct effect			P value	Indirect effect	SMC (R^2)
				From	To	Value			
H8-4	FE	DC	OI	FE	Per	0.059	0.383	0.392	DC = 0.464
				FE	DC	0.681	***		Per = 0.531
				DC	Per	0.687	***		

Table 5-33 Mediates the Dynamic Capability between Functional Experience and Performance

Regarding Table 6.24, Dynamic Capability mediates the relationship between Functional Experience and Performance with a value of 0.392; thus H8-4 is supported.

5.10.8.1 Bootstrapping for Mediation

The mediated relationships are tested in the section below. For testing the significance of the mediated relationship we used the bootstrapping technique. The bootstrapping technique for testing the mediation is readily available in the AMOS 22. For performing the bootstrap the number of bootstrap can be selected between 500 and

1000 (Cheung & Lau, 2008). For the current analysis 1000 bootstraps samples were selected. The results of the mediation along with bootstrapping are shown below.

Hypothesis	Relationship	Direct Effect	P-Value
H7-1	AGE→ORGANIZATIONAL INNOVATION	0.069	0.134
H7-2	EDUCATION→ ORGANIZATIONAL INNOVATION	0.101	0.013
H7-3	TENURE DIVERSITY→ ORGANIZATIONAL INNOVATION	0.187	0.001
H7-4	FUNCTIONAL EXPERIENCE→ ORGANIZATIONAL INNOVATION	0.172	0.005
H8-1	AGE→PERFORMANCE	-0.025	0.732
H8-2	EDUCATION→ PERFORMANCE	0.152	0.016
H8-3	TENURE DIVERSITY→ PERFORMANCE	0.135	0.031
H8-4	FUNCTIONAL EXPERIENCE→ PERFORMANCE	0.059	0.383

Table 5-34 The direct effects of Independent variables on Dependent Variables

	AGE	EDUCATION	TENURE DIVERSITY	FUNCTIONAL EXPERIENCE
Organizational Innovation	0.211	0.01	0.02	0.00
Performance	0.125	0.00	0.01	0.00

Table 5-35 Bootstrapped Approach, Standard Indirect Effects – Two Tailed Significance

The above tables present that the mediating role of dynamic capabilities in the relationship of Education, Tenure diversity and Functional experience with organizational innovation is significant while the there is no mediating role of Dynamic capabilities in the relationship of Age and Organizational innovation. Moreover the role of Dynamic capabilities in the relationship of Education, Tenure diversity and Functional experience with performance is also significant while there is no mediating role of Dynamic Capabilities in relationship of Age and Performance. Hence it can be concluded that H7-2, H7-3, H7-4, H8-2, H8-3 and H8-4 are supported while H7-1 and H8-1 are not supported.

5.11 Chapter Conclusion

The results from the data analysis in investigating the relationship between top management teams' characteristics and organisational innovation: Mediating role of dynamic capabilities using SEM suggest the model is inconclusive as not all the hypothesised relationships where supported as shown in the presentation above. The table below (Table 6.25) now presents a summary of the hypothesised relationships from the model.

Hypothesis	Relationship	Empirical Support
H1-1	Average Age of TMT Members will have a direct positive effect on performance	Rejected
H1-2	Educational Level will have a direct positive effect on Performance	Accepted
H1-3	Tenure Diversity / Heterogeneity will have a direct positive effect on Performance	Accepted
H1-4	Functional Experience will have a direct positive effect on Performance	Accepted
H2-1	Average Age of TMT Members will have a direct positive effect on Exploitative Innovation	Rejected
	Educational Level will have a direct positive effect on Exploitative Innovation	Accepted
	Tenure Diversity / Heterogeneity will have a direct positive effect on Exploitative Innovation	Accepted
	Functional Experience will have a direct positive effect on Exploitative Innovation	Accepted
H2-2	Average Age of TMT Members will have a direct positive effect on Explorative Innovation	Rejected
	Educational Level will have a direct positive effect on Explorative Innovation	Accepted
	Tenure Diversity / Heterogeneity will have a direct positive effect on Explorative Innovation	Accepted
	Functional Experience will have a direct positive effect on Explorative Innovation	Accepted
H3	Average Age of TMT Members will have a direct positive effect on Dynamic Capability	Rejected
	Educational Level will have a direct positive effect on Dynamic Capability	Accepted
	Tenure Diversity / Heterogeneity will have a direct positive effect on Dynamic Capability	Accepted
	Functional Experience will have a direct positive effect on Dynamic Capability	Accepted
H3-1 **H3-2** **H3-3** **H3-4**	Average Age of TMT Members will have a direct positive effect on Sensing Opportunities Capability, Learning, Integrating and Coordinating	Rejected
	Educational Level will have a direct positive effect on Sensing Opportunities Capability, Learning, Integrating and Coordinating	Accepted

	Tenure Diversity / Heterogeneity will have a direct positive effect on Sensing Opportunities Capability, Learning, Integrating and Coordinating	Accepted
	Functional Experience will have a direct positive effect on Sensing Opportunities Capability, Learning, Integrating and Coordinating	Accepted
H4 H4-1 H4-2	Coordinating Capability will have a direct positive effect on Organisational Innovation (Exploitative and Explorative)	Rejected
	Dynamic capability (Sensing Opportunities Capability, Learning Capability, Integrating Capability) will have a direct positive effect on Exploitative Innovation	Accepted
	Dynamic capability (Sensing Opportunities Capability, Learning Capability, Integrating Capability) will have a direct positive effect on Explorative Innovation	Accepted
Hypothesis	**Relationship**	**Empirical Support**
H5	Coordinating Capability will have a direct positive effect on Performance	Rejected
	Dynamic Capability (Sensing Opportunities Capability, Learning Capability, Integrating Capability) will have a direct positive effect on Performance	Accepted
H6	Organisational Innovation (Exploitative Innovation and Explorative Innovation) will have a direct positive effect on Performance	Accepted
H7-1	Dynamic Capability will mediate the relationship between Average Age of TMT Members and Organisational Innovation	Rejected
H7-2	Dynamic Capability will mediate the relationship between Educational Level of TMT Members and Organisational Innovation	Accepted
H7-3	Dynamic Capability will mediate the relationship between Tenure Diversity / Heterogeneity of TMT Members and Organisational Innovation	Accepted
H7-4	Dynamic Capability will mediate the relationship between Functional Experience of TMT Members and Organisational Innovation	Accepted
H8-1	Dynamic Capability will mediate the relationship between Average Age of TMT Members and Performance	Rejected
H8-2	Dynamic Capability will mediate the relationship between Educational Level of TMT Members and Performance	Accepted
H8-3	Dynamic Capability will mediate the relationship between Tenure Diversity / Heterogeneity of TMT Members and Performance	Accepted
H8-4	Dynamic Capability will mediate the relationship between Functional Experience of TMT Members and Performance	Accepted

Table 5-36 Summary of the Hypothesised Relationships from the Conceptual Model

6 Qualitative Analysis

6.1 Overview of the Chapter

As mentioned earlier in Chapter 4, this research collected both qualitative and quantitative data as a means of answering the research questions. This chapter presents the results of the qualitative research with a view to explaining and providing a more in-depth analysis of the research results. The chapter includes a description of the development of interview protocol to explore in depth the results of the qualitative analysis of the findings from the interviews conducted to establish a rich, in-depth understanding of research outcomes from the quantitative analysis in order to increase the validity and reliability of these outcomes. The chapter presents the demographic information on the research participants, the data collection process, the analysis of the data and presents the findings of the research.

6.2 Interview Protocol Development

The development of the interview protocol was conducted to examine in detail and elaborate on the results of the first quantitative phase. Because of the nature of the mixed methods sequential explanatory design (Creswell et al., 2003), the content of the interview questions was based on the statistical results of the relationships between the participants. The protocol consisted of 13 questions and these focused on interpreting the results from the first stage, quantitative analysis, in terms of whether it was statistically significant or non-significant in order to have in-depth understanding regarding the phenomenon.

The interview protocol was pilot tested on a participant who had been intentionally chosen from the group who had filled out the survey in the initial, quantitative phase of the project. The protocol was changed a little following pilot interview analysis. These alterations are considered next.

6.3 Interview Participants

This research adopted a face-to-face approach for the interviews where structured questions were used. The interviews involved 20 participants, who were purposefully selected to ensure the required aims of the interviews were met. The interview sample consisted of 20 participants, 18 males and 2 females, who represented different companies. All the interviewees were between the ages of 35 and 50. Their gender, profession and location are illustrated in the following table (6.1).

Each participant interview lasted from 35-45 minutes based on the structured questions produced. During the interviews, participants gave consent for the recording of the interviews which were then later transcribed for easy analysis and scrutiny. For the purposes of anonymity, all 20 the interviewees were coded using the numbers 1 to 20 as shown in the table below.

Participant code	Job Description	Male	Female
1	General Manager	✓	
2	Vice President	✓	
3	General Manager	✓	
4	Vice General Manager	✓	
5	Chief Officer		✓
6	General Manager	✓	
7	Vice President	✓	
8	Chief Officer	✓	
9	General Manager	✓	
10	Vice General Manager	✓	
11	General Manager		✓
12	General Manager	✓	
13	Vice General Manager	✓	
14	Chief Officer	✓	
15	General Manager	✓	
16	Vice President	✓	
17	General Manager	✓	
18	Vice General Manager	✓	
19	General Manager	✓	
20	Chief Officer	✓	

Table 6-1 Sample of Interviewees
Source: The Researcher

6.4 Qualitative Data Collection and Analysis

Yin (2013) claims that interviews are one of the principle ways of gathering qualitative data. For this research, qualitative data were collected through the use of structured interviews involving 20 interviewees who formed part of the TMT in their respective companies. The interviewees helped to present in-depth views on the outcomes of the quantitative analysis

6.4.1 Qualitative Data

The research employed in-depth semi-structured interviews as the primary data collection technique which was directed at 20 carefully chosen participants. These were recorded and saved as audio files on separate CD-ROMs. The participants were given the interview questions before the interviews and were also advised they would be recorded and transcribed. Immediately following each interview, the Researcher put down his reflections on what had emerged from the discussion.

6.4.2 Qualitative Analysis

Data collection and analysis are conducted concurrently in qualitative analysis. Creswell (2002) advises that each interview should be taped and transcribed. The transcriptions are then checked for accuracy by comparing them to the audio. Content analysis was used to carry out open-coding and analysis of the text data. The objective in doing this is to achieve a concise and broad illustration of the phenomenon, with the final outcome being a number of concepts or categories that describe the phenomenon.

A model can then be built around these concepts or categories (Zhang and Wildemuth, 2009). Flick (2004) picks out the strengths of qualitative content analysis. Its systematic nature makes the procedure transparent, understandable, and easy to master and transplant into new research questions. Moreover, there is usually a system of categories at the core of the analysis, similar to quantitative content analysis, but this is reviewed during the analysis with feedback loops and is easily adapted to the

material. It also regulates governed procedure which allows for improved implementation of quality criteria and inter-coder reliability. A large amount of data can be processed with qualitative content analysis, which makes it possible to challenge the often-criticised division between quantitative and qualitative information.

6.5 Questions Addressed by the Research

Some questions were developed based on the results of the quantitative analysis. The principle objective of the structured questions was to maintain the focus of the interviewees during the process of data collection. Based on this, 13 questions were created. Qualitative content analysis and thematic analysis were carried out to interpret the data collected. The results are set out in tables where this is necessary.

6.6 Qualitative Findings

6.6.1 Question One

The first question demonstrates the level of performance of the company, as shown in Table 6-2.

Answer Alternatives				Total	χ^2 Values		
Description	High	Medium	Limit		Calculated	Tabulated	Sig
Frequency	16	4	0	20	5.400	3.841	0.020
Percent	80%	20%	0%	100%			

Table 6-2 Level of Performance

The highest percentage (80%) confirm that the level of performance in their company was high compared to (20%) who confirmed that the level of performance in their company was Medium; through using the $\chi 2$, the results showed a statistically significant difference in answering (High). The $\chi 2$ calculated value was (5.400), compared with the $\chi 2$ tabulated value which was 3.841. This means that the small and medium construction companies in Riyadh in the Kingdom of Saudi Arabia strive to achieve high levels of performance.

6.6.2 Question Two

The second question, demonstrates the drivers to achieve high levels of performance in each company, as shown in Table 6-3.

Answer Alternatives				Total
Description	Top Management Support	Dynamic Capabilities	Innovation	
Frequency	7	9	4	20
Percent	35%	45%	20%	100%

Table 6-3 Drivers to Achieve High Levels of Performance

The highest percentage (45%) confirm that the dynamic capabilities are better drivers to achieve high levels of performance at small and medium construction companies in Riyadh in the Kingdom of Saudi Arabia, followed immediately by top management support at 35% and thirdly, innovation at 20%. This reflects that the level of performance is affected by a set of variables with dynamic capabilities in first place followed by the support of top management and then innovation, which reflected the results of quantitative analysis of the research hypotheses.

6.6.3 Question Three

The third question, demonstrates the level of organisational innovation in each company, as shown in Table 6-4.

Answer Alternatives				Total	χ^2 Values		
Description	High	Medium	Limit		Calculated	Tabulated	Sig
Frequency	16	4	0	20	5.400	3.841	0.020
Percent	80%	20%	0%	100%			

Table 6-4 Level of Organisational Innovation

The highest percentage (80%) confirm that the level of organisational innovation in their company was high compared to 20% who confirmed that the level of organisational innovation in their company was Medium; the $\chi 2$ results showed a statistically significant difference in answering (High). The $\chi 2$ calculated value was 5.400, compared with the $\chi 2$ tabulated value which was 3.841. This means that the

small and medium construction companies in Riyadh in the Kingdom of Saudi Arabia strive to achieve high levels of organisational innovation.

6.6.4 Question Four

The fourth question, demonstrates the sources of organisational innovation for each company, as shown in Table 6-5.

Answer Alternatives				Total
Description	Top Management Characteristics	Internal Support for Organisational Innovation	External Support for Organisational Innovation	
Frequency	12	6	2	20
Percent	60%	30%	10%	100%

Table 6-5 Sources of Organisational Innovation

The highest percentage (60%) confirmed that top management characteristics are the greatest source of organisational innovation for small and medium construction companies in Riyadh in the Kingdom of Saudi Arabia. This was followed immediately internal support for organisational innovation at 30% and thirdly, external support for organisational innovation at 10%. This reflects that the level of sources of organisational innovation is affected by a set of variables with top management characteristics in first place followed by internal support for organisational innovation and then external support for organisational innovation, which reflects the results of quantitative analysis of the research hypotheses.

6.6.5 Question Five

The fifth question, demonstrates the sources of organisational innovation that most influence each company, as shown in Table 6-6.

Answer Alternatives				Total
Description	Top Management Characteristics	Internal Support for Organisational Innovation	External Support for Organisational Innovation	
Frequency	16	4	0	20
Percent	80%	20%	0%	100%

Table 6-6 Sources of Organisational Innovation that Have Most Influence on Each Company

The highest percentage (80%) confirmed that the sources of organisational innovation that had most influence on their company are top management characteristics compared to 20% who confirmed that the sources of organisational innovation that had most influence on their company are internal support for organisational innovation. This means that the sources of organisational innovation that have most influence on small and medium construction companies in Riyadh in the Kingdom of Saudi Arabia are top management characteristics followed internal support for organisational innovation.

6.6.6 Question Six: What is your Need for Organisational Innovation?

The sixth question demonstrates the need for organisational innovation for small and medium construction companies in Riyadh in the Kingdom of Saudi Arabia. The result of this question demonstrates that the need for organisational innovation is represented by three main points: firstly, covering areas of failure; secondly, continuous improvement and development; thirdly, learning from previous experiences to meet challenges and competitors. This means that the small and medium construction companies in Riyadh in the Kingdom of Saudi Arabia need organisational innovation for three reasons arranged in descending order:

1. Learning from previous experiences to meet challenges and competitors at 40%.
2. Covering areas of failure at 35%.
3. Continuous improvement and development at 25%.

6.6.7 Question Seven

The seventh question demonstrates the contribution of the TMT in the achievement of satisfactory performance as shown in Table 6-7.

Answer Alternatives				Total
Description	High	Medium	Limit	
Frequency	14	6	0	20
Percent	70%	30%	0%	100%

Table 6-7 Contribution of Top Management Team in the Achievement of Satisfactory Performance

The highest percentage (70%) confirmed that the TMT contributes to achievement of satisfactory performance to a high degree compared to 30% who confirmed that the TMT contributes to achievement of satisfactory performance to a medium degree which is consistent with the results of hypotheses H1-2; H1-3; H1-4 that confirmed that Educational Level, Tenure Diversity / Heterogeneity and Functional Experience positively contribute to achievement performance.

6.6.8 Question Eight

The eighth question demonstrates the contribution of TMT in the achievement of organisational innovation as shown in Table 6-8.

Answer Alternatives				Total
Description	High	Medium	Limit	
Frequency	16	4	0	20
Percent	80%	20%	0%	100%

Table 6-8 Contribution of Top Management Team in the Achievement of Organisational Innovation

The highest percentage (80%) confirmed that the TMT contributes to the achievement of organisational innovation to a high degree compared to 20% who confirmed that the TMT contributes to the achievement of organisational innovation to a medium degree which is consistent with the results of hypotheses H2-1 and H2-2 that confirmed that Educational Level, Tenure Diversity / Heterogeneity and Functional Experience positively contribute to the achievement of Exploitative Innovation and Explorative Innovation.

6.6.9 Question Nine

The ninth question, demonstrates the contribution of TMT to enhancing dynamic capabilities as shown in Table 6-9.

Answer Alternatives				Total
Description	High	Medium	Limit	
Frequency	14	6	0	20
Percent	70%	30%	0%	100%

Table 6-9 Contribution of Top Management Team to Enhance Dynamic Capabilities

The highest percentage (70%) confirmed that the TMT contributes to enhancing dynamic capabilities to a high degree compared to 30% who confirmed that the TMT contributes to enhancing dynamic capabilities to a medium degree which is consistent with the results of hypotheses H3-1, H3-2, H3-3 and H3-4 that confirmed that Educational Level, Tenure Diversity / Heterogeneity and Functional Experience positively contribute to enhancing dynamic capabilities (Sensing Opportunities Capability, Learning Capability, Integrating Capability and Coordinating Capability).

6.6.10 Question Ten

The tenth question demonstrates the contribution of dynamic capabilities to the achievement of organisational innovation (Exploitative Innovation and Explorative Innovation), in addition how, as shown in Table 6-10.

Answer Alternatives				Total
Description	High	Medium	Limit	
Frequency	16	4	0	20
Percent	80%	20%	0%	100%

Table 6-10 Contribution of Dynamic Capabilities in the Achievement of Organisational Innovation

The highest percentage (80%) confirmed that dynamic capabilities contribute to the achievement of organisational innovation to a high degree compared to 20% who confirmed that dynamic capabilities contribute to the achievement of organisational innovation to a medium degree. The 20 participants in the interviews confirmed that there are two ways dynamic capabilities contribute to the achievement of

organisational innovation. The first way is through coordination and integration of business to support the good exploitative opportunities of available resources; this reflects on the exploration of opportunities and supports organisational innovation. The second way is through taking advantage of previous experiences (learning) to enhance innovations. These ways are consistent with the results of hypotheses H4, H4-1 and H4-2 that confirmed that Sensing Opportunities Capability has a positive direct effect on Organisational Innovation, Learning Capability has a positive direct effect on Organisational Innovation, Integrating Capability has a positive direct effect on Organisational Innovation (Exploitative Innovation and Explorative Innovation).

6.6.11 Question Eleven

The eleventh question demonstrates the contribution of dynamic capabilities on enhancing performance, in addition how, as shown in Table 6-11.

Answer Alternatives				Total
Description	High	Medium	Limit	
Frequency	16	4	0	20
Percent	80%	20%	0%	100%

Table 6-11 Contribution of Dynamic Capabilities to Enhance Performance

The highest percentage (80%) confirmed that dynamic capabilities contribute to enhancing Performance to a high degree compared to 20% who confirmed that dynamic capabilities contribute to enhancing Performance to a medium degree. The 20 participants in the interviews confirmed that there are three ways dynamic capabilities contribute to enhancing performance. The first way is through coordination of internal activities; this is reflected in enhancing performance. The second way is through exploring new opportunities which enhances the identification of new business areas and thus enhances performance levels. The third way is by learning from previous experiences to enhance and improve performance levels. These ways are consistent with the results of hypothesis H5 that confirmed that Sensing Opportunities Capability has a positive direct effect on Performance, Learning Capability has a positive direct effect on Performance, Integrating Capability has a positive direct effect on Performance.

6.6.12 Question Twelve

The twelfth question demonstrates the importance of organisational innovation on achieving high levels of performance. The 20 participants in the interviews confirmed that there are two ways organisational innovation contributes to achieving high levels of performance. The first way is through organisational innovation enhancing competition and this requires high levels of performance. The second way is through indicating that organisational innovation leads to improved performance by identifying areas of failure in business. These ways are consistent with the results of hypothesis H6 that confirmed that Exploitative Innovation has a positive direct effect on Performance and Explorative Innovation has a positive direct effect on Performance.

6.6.13 Question Thirteen

The thirteenth questions demonstrates the role played by dynamic capabilities in achieving organisational innovation and performance. The 20 participants of interview confirm that the availability of dynamic capabilities gives organisations an advantage and enables them to achieve organisational innovation and improve performance. These results are consistent with the results of all hypotheses in the current research.

6.7 Conclusion

This chapter has explored the qualitative analysis process and discussed the findings. It set out a comprehensive and integrated model for the development of categories, concepts and properties of the research matter being studied. Attention was also given to the sample chosen for the interviews. The results confirm that the small and medium construction companies in Riyadh in the Kingdom of Saudi Arabia are striving to achieve high levels of performance. The level of performance is affected by a set of variables; dynamic capabilities come first followed by the support of top management and then innovation. The small and medium construction companies in Riyadh in the Kingdom of Saudi Arabia strive to achieve high levels of organisational innovation. The level of sources of organisational innovation is affected by a set of variables with top management characteristics coming in first

place followed by the internal support for organisational innovation and then external support for organisational innovation. The sources of organisational innovation that have most influence on small and medium construction companies in Riyadh in the Kingdom of Saudi Arabia are top management characteristics followed internal support for organisational innovation. Finally, the small and medium construction companies in Riyadh in the Kingdom of Saudi Arabia need organisational innovation to learn from previous experiences, cover failure areas and continuously improve and develop.

7 Discussion of Findings

7.1 Overview of the Chapter

Chapters 6 and 7 have presented the results from the qualitative and quantitative data analysis process based on the different questions posed during the collection of data for this research. The chapter has also served as the basis to test the hypothesis set up for this research. In this chapter, the results are discussed with reference to the current literature on TMT characteristics, dynamic capabilities and firm performance. The chapter discusses the results in relation to the research questions posed and the objectives set in Chapter 1 of this research. This chapter also revises the framework developed from the review of literature by reviewing and discussing the key findings emerging from the empirical analysis in line with extant literature. This revision is based on the re-specification of the hypothesis that are not supported. The chapter is divided into six main sections and these cover the discussion of the relationship between the framework factors analysed in the quantitative phase together with the views shared throughout the interviews, and the implications of the research findings. As part of the discussion process, the key themes of the research are grouped together for easy flow of the discussion.

7.2 Revised Conceptual Framework

This research explore literature on top management team characteristics (age diversity, level of education, tenure diversity, functional experience), dynamic capabilities (sensing capability, learning, integrating, coordinating), organisational innovation (exploitative and explorative) and organisational performance to develop a framework for analysing firms performance in the construction sector in Saudi Arabia. This framework is based on the results of relationship between research variables, which contextualises top management characteristics as valuable resources needed, by firms to gain innovation. The framework as shown in fig. 8.1 posits that top management team characteristics affects firm performance directly and indirectly. The indirect effect is captured through the effect of TMT on dynamic capabilities and organisational innovation and both influences organisational performance. The

framework also suggests that dynamic capabilities mediate the top management team characteristics – organisational performance relationship.

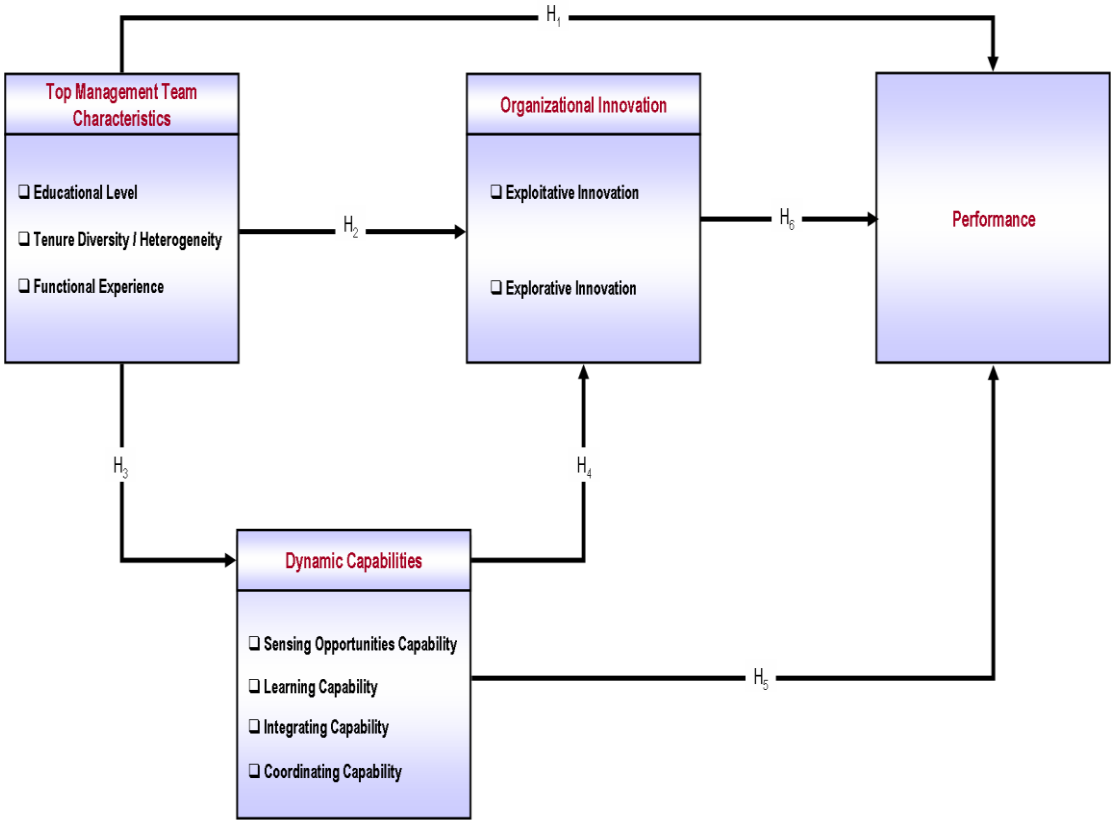

Figure 7-1 Proposed Research Framework
Source: The Researcher

This therefore provides the basis for a revision of the framework to reflect the findings.

All the hypotheses where based on positive effect relationships in the framework. However, after collecting and analysing data using SEM, it can be revealed that not all hypotheses where supported. An example is average age of TMT members not influencing firm performance directly and indirectly through innovation and dynamic capabilities. In this light, a revised framework could be that the direct and indirect effect of average TMT members on firm performance is not significant.

7.3 Revision of Hypotheses

This section discusses the various hypotheses. Both significant and non-significant hypothesis are discussed in relation to the literature. The non-significant hypotheses

therefore provides the basis for revision of the framework as they are being supported by relevant literature.

7.3.1 Relationship between TMT Characteristics and Performance

The first finding discussed in this research is the relationship between TMT characteristics and performance. However, not all the variables used to measure TMT where found to be significant in this relationship. The relationship between Average Age of TMT Members and performance in small- and medium-sized construction companies in Riyadh in the Kingdom of Saudi Arabia was found to be insignificant. As a result, hypothesis H1-1 is unsupported. This result is supported by the studies undertaken by several researchers (Nielsen and Nielsen, 2013; Wei and Wu, 2013). For example, Nielsen and Nielsen (2013) empirically noticed a negative and non-significant relationship between average age and performance in Swiss industrial sector. Also, the results found that the relationship between Educational Level, Tenure Diversity / Heterogeneity, Functional Experience and performance in small- and medium-sized construction companies in Riyadh in the Kingdom of Saudi Arabia was significant. As a result, hypotheses H1-2, H1-3 and H1-4 are supported. This result is supported by the studies undertaken by several researchers (Nielsen and Nielsen, 2013; Cannella et al., 2008; Certo et al., 2006). For example, over eleven different industries in the USA, Cannella et al. (2008) were not able to approve a significant relationship between Tenure Diversity and innovation in organisations. Further, according to meta analyses study conducted by Certo et al. (2006) for 29 empirical studies examining the impact of TMT characteristics and on the financial performance, neither between Educational Level nor Tenure Diversity has a relationship with performance between Educational Level, Tenure Diversity.

These results are consistent with the results of the seventh question in the qualitative research that reveal that 70% confirmed that the TMT contributes to the achievement of satisfactory performance to a high degree. The qualitative research results also support the answers produced in the quantitative research which suggests that TMT characteristics influence performance. Based on the analysis and in the context of this research, average age of TMT members is insignificant in influencing firm performance and therefore a revised framework coul be that average age of TMT

workers negatively influence firm performance. This is true based on the analysis in chapter 5 and the findings are also been supported from extant literature.

7.3.2 Relationship between TMT Characteristics and Innovation

Due to the importance of innovation in improving the performance of construction companies, this research also sought to identify the relationship between TMT characteristics and innovation in construction firms. Based on the analysis of both qualitative and quantitative research, the results indicate that not all TMT characteristics have an influence on the innovativeness of firms. The relationship between Average Age of TMT Members and exploitative, explorative Innovation in small- and medium-sized construction companies in Riyadh in the Kingdom of Saudi Arabia were found to be insignificant. As a result, hypotheses H2-1-1 and H2-2-1 are unsupported. Over Danish firms sector, similar findings were also reached by Østergaard et al. (2011) who noticed the non-significant impact of average age on innovation. On the other hand,, the results found that the relationship between Educational Level, Tenure Diversity / Heterogeneity, Functional Experience and exploitative, explorative Innovation in small- and medium-sized construction companies in Riyadh in the Kingdom of Saudi Arabia were significant. As a result, hypotheses H2-1-2, H2-1-3, H2-1-4, H2-2-2, H2-2-3 and H2-2-4 are supported. These results are supported by the studies undertaken by several researchers (Yuan et al., 2014; Mihalache et al., 2012; Heyden et al., 2013; Yang and Wang, 2014). For instance, Mihalache et al. (2012) and Heyden et al. (2013) have provided strong evidences supporting the association between top level managers and their organisation's innovativeness in different contexts. The crucial role of TMT characteristics in shaping the level of organizational innovation has also been largely discussed and approved by Yuan et al. (2014).

Additionally, these results are consistent with the results of the eighth question in the qualitative research that revealed that 80% confirmed that the TMT contributes to the achievement of Organisational Innovation to a high degree. Based on the above discussion, the non-significant hypotheses could be re-specify to reflect the insignificant effect as validated by the analysis of the data.

7.3.3 Relationship between TMT Characteristics and Dynamic Capability

The relationship between Average Age of TMT Members and Dynamic Capability (sensing opportunities capability, learning capability, integrating capability and coordinating capability) in small- and medium-sized construction companies in Riyadh in the Kingdom of Saudi Arabia was found to be insignificant. As a result, hypothesis H3 and its sub hypotheses are unsupported. This result is supported by the studies undertaken by several researchers (Proeller et al., 2011; Andrews et al., 2009). As discussed in the prior chapter, Proeller et al. (2011) stated that the related issues of impacting TMT characteristics on DCs shrouded in some mystery and needs more investigations as well (Proeller et al., 2011). Moreover, Andrews et al. (2009) argue that a sole rational planning approach, i.e., just having in place a formal planning process, does not create performance and innovation effects. Also, the results found that the relationship between Educational Level, Tenure Diversity / Heterogeneity, Functional Experience and Dynamic Capability (sensing opportunities capability, learning capability, integrating capability and coordinating capability) in small- and medium-sized construction companies in Riyadh in the Kingdom of Saudi Arabia were significant. As a result, hypothesis H3 and its sub hypotheses are supported. This result is supported by the studies undertaken by several researchers (Proeller and Siegel, 2010). In details, Proeller and Siegel (2010) argued that DCs could be contributed by the role of TMT characteristics, which in turn, positively reflects on the level of innovation.

Additionally, these results are consistent with the results of the ninth question in the qualitative research that reveals that 70% confirmed that that the TMT contributes to enhancing Dynamic Capabilities to a high degree. Based on the above discussion, the revised framework depicts the significant hypotheses, which has been validated by the data collected, analysed using structural equation modelling and discussed with extant literature.

7.3.4 Relationship between Dynamic Capability and Innovation

The relationship between Coordinating Capability and exploitative, explorative Innovation in small- and medium-sized construction companies in Riyadh in the Kingdom of Saudi Arabia was found to be insignificant. As a result, hypothesis H4

and its sub hypotheses are unsupported. This result is supported by the studies undertaken by several researchers such as Protogerou et al., 2008 who empirically tested the impact of DCs over the Greek manufacturing sector. Protogerou et al. (2008) were not able to prove the impact of Dynamic capabilities and technological capabilities on the marketing performance, and accordingly, innovation.

Also, the results found that the relationship between sensing opportunities capability, learning capability, integrating capability and exploitative, explorative Innovation in small- and medium-sized construction companies in Riyadh in the Kingdom of Saudi Arabia was significant. As a result, hypothesis H4 and its sub hypotheses are supported. This result is supported by the studies undertaken by several researchers (Verona and Rabasi, 2003; Zheng et al., 2011; Hsu and Sabherwal, 2012). In this regard, Verona and Rabasi (2003) assured the fact that so as to maintain sustained levels of innovation, organisations must develop dynamic capabilities that allow the simultaneous and continuous creation, absorption and integration of knowledge. By the same taken, a field study undertaken by Zheng et al. (2011) demonstrates a strong relationship between innovation performance and DCs. Additionally, these results are consistent with the results of the tenth question in the qualitative research that revealed that 80% confirmed that Dynamic Capability contributes to the achievement of exploitative, explorative Innovation to a high degree.

7.3.5 Relationship between Dynamic Capability and Performance

The relationship between Coordinating Capability and Performance in small- and medium-sized construction companies in Riyadh in the Kingdom of Saudi Arabia was found to be insignificant. As a result, hypothesis H5 is unsupported. This result is supported by the studies undertaken by several researchers (Protogerou, Caloghirou and Lioukas, 2012). Also, the results found that the relationship between sensing opportunities capability, learning capability, integrating capability and performance in small- and medium-sized construction companies in Riyadh in the Kingdom of Saudi Arabia was significant. As a result, hypothesis H5 is supported. This result is supported by the studies undertaken by several researchers (Wilden, Gudergan and Lings, 2013; Helfat et al., 2007; Zott, 2003). According to Wilden et al. (2013), DCs could either directly or indirectly contribute to the level of performance. This indirect

impact could also be reached via creating, extending and modifying the resource base while the direct influence of DCs is more likely to be captured from a cost perspective as costs are created by the creation, maintenance and use of DCs (Wilden et al., 2013). Likewise, Zott (2003) claims that DCs are indirectly linked to the performance of organisations as the aim is to change a firm's bundle of resources, operational routines and competencies, which in turn affects economic performance. Additionally, these results are consistent with the results of the tenth question in the qualitative research that reveal that 80% confirmed that Dynamic Capability enhances Performance to a high degree.

7.3.6 Relationship between Organisational Innovation and Performance

The relationship between exploitative, explorative Innovation and Performance in small- and medium-sized construction companies in Riyadh in the Kingdom of Saudi Arabia was found to be significant. As a result, hypothesis H6 is supported. This result is supported by the studies undertaken by several researchers (Aragon-Correa et al., 2007; Calantone et al., 2002; Hult, Hurley, & Knight, 2004). For example, Aragon-Correa et al. (2007) argued that innovation as a one of the main mechanisms adopted by organizations so as to capture the new knowledge, new process and new products and services, and accordingly, contributing to their performance (Aragon-Correa et al., 2007). Another evidence supporting the association between innovation and performance was also provided by Calantone et al. (2002) also contribute to this by suggesting that innovation design and innovation speed are positively related to organisational performance.

Additionally, these results are consistent with the results of the twelfth question in the qualitative research that reveal that the 20 participants in the interviews confirmed that there are two ways Organisational Innovation contributes to achieving high levels of performance. The first way is that Organisational Innovation enhances competition and this requires high levels of performance. The second way is that Organisational Innovation leads to improved performance by identifying areas of failure in business.

7.3.7 Mediating Effect of Dynamic Capabilities

The results showed that the mediating effect of Dynamic capability in the relationship between Average Age of TMT Members and Organisational Innovation on the one hand and performance on the other hand in small- and medium-sized construction companies in Riyadh in the Kingdom of Saudi Arabia were found to be insignificant. As a result, hypotheses H7-1 and H8-1 are unsupported. Also, the results found that the mediating effect of Dynamic capability in the relationship between Educational Level, Tenure Diversity / Heterogeneity, Functional Experience and Organisational Innovation on the one hand, and performance on the other hand in small- and medium-sized construction companies in Riyadh in the Kingdom of Saudi Arabia was found to be significant. As a result, hypotheses H7-2, H7-3, H7-4, H8-2, H8-3 and H8-4 are supported. These results have come to be consistent with Fainshmidt, Pezeshkan's et al. (2016) results which approved the mediating role of technological dynamism. Pezeshkan et al. (2016) attributed this to the fact that the higher-order DCs are more strongly related to performance than lower-order ones, with lower-order ones partly mediating the relationship between higher-order DCs and performance, and DCs assist more towards performance in developing economies than in developed ones. In their study, Rehman and Saeed (2015) also supported the mediating impact of organisational competencies on the relationship between TMT characteristics and organisational performance.

Additionally, these results are consistent with the results of the thirteenth question in the qualitative research that reveal that the 20 participants in the interviews confirmed that the availability of Dynamic Capabilities gives organisations an advantage and enables them to achieve Organisational Innovation and improve performance.

To conclude, this research has adopted a rigorous methodology to analyse the direct and indirect effect of TMT characteristics on firm's performance on firms in Saudi Arabia's construction sector. However and based on the analysis of the data, not all the hypotheses where supported as discussed above. Even though the significant hypotheses have been validated by our analysis, the non-significant relationships where also validated and therefore provides the bases to make claims for revision. The revised framework could therefore see the specification of the insignificant

hypotheses to reflect the results from the analysis (e.g., average age of TMT members has a direct and indirect non-significant relationship with firms performance).

7.4 Implications of Research Findings

This section discusses the implications of the research findings. From the results of this research, several implications are derived which are of significance to the subject area. This section presents the implications of the research findings.

The framework designed in Chapter 3 of this research was tested in the data collection and analysis to determine the relationships between TMT characteristics, organisational innovation, dynamic capabilities and organisational performance.

The outcome of the tests discussed in this chapter indicate that, whereas TMT characteristics may influence dynamic capabilities of the firm, characteristics such as average age of TMT members does not have an effect. This implies that in forming or designing TMT for small- and medium-sized construction firms, age is not necessarily a factor but rather educational level, tenure diversity and heterogeneity and functional experience are more important characteristics. For construction firms to build dynamic capabilities, these characteristics should be found in their TMT and form part of the process of building or putting together the TMT.

Another implication of the research results presented in this chapter is that TMT characteristics can also lead to innovation in construction firms. This implies that for construction firms to be innovative, (at least for small- and medium-sized construction firms), there is the need to pay attention to the characteristics of the firm's TMT, which will be in charge of directing the affairs of the firm. Again, age is not an impactful factor but educational level, tenure diversity and functional experience are. This means periodic change in the TMT is very likely to lead to new innovative ideas in the team which can translate into innovation for the firms.

In line with the impact of dynamic capabilities and innovation as well as firm performance, the implication of this research is that capabilities such as sensing, learning and integrating are major elements that support both innovativeness and

improved performance. This makes such capabilities critical and efforts must be made to develop such capabilities in the TMT in charge of managing construction firms. Having such capabilities will not only impact on the innovativeness of firms but will also lead to increased performance as firms are likely to come up with new ideas based on their ability to sense new trends and to learn to meet those demands whereas being able to integrate same into the activities of the firm.

7.5 Chapter Conclusion

This chapter has discussed the outcome of the research in line with the literature and also presented the implications of the research findings for improving the performance of small- and medium-sized construction firms in Saudi Arabia. The outcome of this research indicates that the results are largely supported in the literature and are consistent with studies by other researchers in different countries. The implication of the research results is that TMT characteristics have a place in improving the performance of construction firms through the building of dynamic capabilities which can lead to innovativeness. The next chapter concludes this research by reviewing the achievement of the research aim and objectives and also by presenting the conclusions and recommendations for the research.

8 Conclusions and Recommendations

8.1 Overview of the Chapter

Based on the results obtained from the previous chapters, and the discussion provided in Chapter 8, this chapter provides a conclusion to the research by reviewing the extent to which the key aim and objectives have been met. The chapter summarises the main conclusions of the research and also presents the recommendations for practice and for further research.

8.2 Achievement of Aim and Objectives

This research aims to investigate the mediating effect of dynamic capabilities on the relationship between TMT characteristics, organisational innovation and Performance. Throughout the different stages, the literature review; methodology design; data collection and analysis, the different objectives of this research were met. This section of the thesis describes the extent to which these have been evidenced in the thesis. Table 9.1 below presents a summary of the achievement of the research aims and objectives.

Research Aims	Research Objectives	Achievement of Objectives	Evidence of Achievement of Objectives
To investigate the mediating effect of dynamic capabilities on the relationship between TMT characteristics, organisational innovation and Performance	**Objective 1:** Critically review the literature in the field of TMT characteristics, dynamic capabilities, organisational innovation and performance.	A critical review of the literature was conducted on TMT characteristics, dynamic capabilities and organisational innovation and performance. The results of the literature review suggest that	Evidence of achievement of this objective is provided in Chapter 2 of this thesis, Sections 2.2 – 2.8.
	Objective 2: Determine the construct validity for the proposed framework, its potential benefits and limitations.	Based on the outcome of the literature review and the review of theories relating to TMTs, a theoretical framework was developed.	Evidence is presented in Chapter 3 of this thesis.
	Objective 3: Examine the effect of TMT characteristics on Performance, organisational innovation and dynamic capabilities.	Through data collection and analysis, the effect of TMT characteristics on performance and organisational innovation are investigated.	Evidence is provided in Chapters 5, 6, and 7 of this thesis.
	Objective 4: Examine the effect of dynamic capabilities on performance, organisational innovation.	This research examined the effect of dynamic capabilities through the qualitative and quantitative data analysis and discussion.	Evidence is provided in Chapters 5, 6 and 7 of this thesis.
	Objective 5: Explore the effect of organisational innovation on performance.	The impact of organisational innovation on performance is investigated through the literature review and the data analysis conducted on the qualitative and quantitative data gathered.	Evidence is provided in Chapters 5, 6 and 8 7 of this thesis.
	Objective 6: Examine the mediating effect of dynamic capabilities on the relationship between TMT characteristics, organisational innovation and Performance.	The mediating effect was examined through the collection, analysis and interpretation of data collected from construction industry personnel on the subject and the use of structural equation modelling to test the relationships in the model produced.	Evidence of this is shown in Chapters 6 and 7.
Provide practical guidance for implementation of the strategic framework to academia and the private industry.	This objective of the research is achieved by providing practical implications of this research and recommendations for adopting the outcome of this research to improve organisational performance.		Evidence is provided in Chapter , Sections 8.4 and8.5

Table 8-1 Review of aims and objectives

As shown in the table above, this research set out to achieve two main aims which were further divided into six objectives. The objectives have all been achieved to verifying extents as shown in the table which led to answers for the research questions proposed. Six research questions were also posed in an attempt to meet the aims of the research. Table 9.2 below summarises the answers to the research questions posed in Section 1.5.

Research Questions	Answers to Research Questions	Evidence in Thesis
Question One: To what extent the knowledge efforts reached on the conceptual literature of top management team's characteristics, dynamic capabilities, organizational innovation and performance in Business Administration Field?	The review of literature has helped to answer this question in different sections of the thesis. The outcome of the literature review indicates that some TMT characteristics have a direct impact on innovativeness of a organisational which can then influence the performance of the organisation in the business administration field.	Evidence of this is shown in Chapters 2 and 3 of this research.
Questions Two: Are the proposed framework variables characterised by construct validity?	As shown in the analysis and discussion of results, the proposed framework presents valid connections between dynamic capabilities, TMT characteristics, innovation and organisational performance.	Evidence is produced in Chapters 5 and 6
Questions Three: What affect do TMT characteristics have on performance, organisational innovation and dynamic capabilities?	The answer to this question suggests that TMT characteristics such as level of education, tenure diversity and functional experience affect organisational innovation in construction organisations.	Evidence for this is provided in Chapters 5, 6 and 7
Questions Four: What is the effect of dynamic capabilities on performance and organisational innovation?	Dynamic capabilities form a mediating role between innovation and organisational performance such that the more innovative a organisation is	Evidence is provided in Chapter 5 and Chapter 7, Section 7.2.
Questions Five: What is the effect of organisational innovation on performance?	Organisational innovation was identified to have a direct influence on organisational performance. This means the more innovative a organisation is, the better its performance.	Evidence of this is provided in Chapter 7, Section 7.2.
Questions Six: What is the effect of top management teams' characteristics on organisational innovation and performance via dynamic capabilities?	Dynamic capabilities form a mediating role between TMT characteristics, organisational innovation and organisational performance.	Evidence is provided in Chapter 7, Section 7.2.

Table 8-2 Review of research questions

8.3 Conclusions of the Research

From the achievement of the aims and objectives, as well as the answers to the questions posed by this research a number of key conclusions are made. These conclusions are based on the outcome of this research and may represent the current body of knowledge on the subject of TMTs and organisational performance in Saudi Arabia as well as in industries and countries which share similar characteristics.

8.3.1 Top Management Characteristics, Dynamic Capabilities and Organisational Performance

In relation to top management characteristics, dynamic capabilities, organisational innovation and performance, this research concludes that there is a relationship between certain characteristics of top management and performance. This research concludes that TMT characteristics such as educational level of TMT members, tenure diversity, heterogeneity, and functional experience all have influences on performance. There is however no relationship between average age of TMT members and performance. This conclusion indicates that in determining or designing efforts towards performance improvement in construction companies, age should not be used as a factor as this makes no real difference in terms of contributions to improved performance.

8.3.2 Effect of TMT Characteristics on organisational Innovativeness

Another key outcome of this research is the relationship between TMT characteristics and innovativeness of construction organisational. Innovation is a key aspect of construction contracts due to its ability to lead to improvement of construction companies which ultimately leads to improved performance and client satisfaction. As discussed in this research, organisational innovation relates to both innovation generation and adoption. This research concludes that not all TMT characteristics will influence or lead to innovation. TMT characteristics, such as age of TMT members, do not impact on innovation whereas characteristics such as educational level, tenure diversity or heterogeneity and functional experience of TMT members are known to influence exploitative and explorative innovation. This suggest that for construction

organisations to be innovative, emphasis should be placed on the educational level, tenure diversity and functional experience of TMT members.

8.3.3 Relationship between TMT Characteristics and Dynamic Capabilities

From the results of this research, it can be concluded that in the construction industry, TMT characteristics such as educational level, tenure diversity and heterogeneity and functional experience have a relationship with the dynamic capabilities of the organisation. This means these characteristics would influence the extent to which the team senses opportunities, the learning capabilities of the team and the integrating capabilities of the organisation. TMT can therefore be specifically constituted based on these characteristics to have an influence on the dynamic capabilities of the organisation which can lead to improved performance.

8.3.4 Impact of Dynamic Capabilities on Innovation and Performance of the organisation

One of the key outcomes of this research is the investigation of the link between the dynamic capabilities of small- and medium-sized construction organisations and their innovation as well as performance of the organisations. This research concludes that in terms of coordinating capability, there is no link to innovation whereas sensing, learning and integrative capabilities of the organisations lead to innovation. This means for construction organisations to be innovative, it takes the capability of the organisations to sense opportunities and threats which leads to innovative solutions, their capability to learn new things (which again is a key requirement for innovation) and their capability to integrate new things into their processes.

In relation to dynamic capabilities, the research also concludes that these capabilities have a direct link with the performance of small- and medium-sized construction companies. The same capabilities that relate to innovativeness such as sensing capabilities, learning capabilities and integrating capabilities lead to improved performance. Although coordination capability is expected to also lead to improved performance, this research reports that is not the case in relation to small- and medium-sized construction organisations. The research concludes also that

innovation is a key aspect of performance improvement in the construction industry. In all of these dynamic capabilities are seen to mediate the relationship between innovation in small- and medium-sized construction organisations and the performance of the organisations. This shows the importance to be placed on dynamic capabilities by construction organisations as a means to improve innovativeness and consequently the performance of the organisations.

8.4 Research Contribution

By answering the research questions posed in Section 1.5 of this research, this research has made contributions to theory as well as practice within the area of TMTs in the construction industry. The use of Upper Echelons Theory and the collection of imperial data from construction industry personnel has helped to find answers which are of importance to the industry. This section provides key contributions made by this research to the academic literature in this field, academic, practitioners and organisational contributions of the research, limitations of the research and suggestions for future research.

8.4.1 Theoretical and Empirical Contribution

This research has contributed to theory by reviewing literature on TMT characteristics, innovation, dynamic capabilities and organisational performance to develop a framework of organisational performance in the construction industry in Saudi Arabia.

Accordingly, this study was able to find the current gap literature which has been covered in the current study, and therefore, contributing to the current understanding over the related area. For example, it has been mentioned in the part devoted to literature gap that the impact of TAM characteristics: TAM diversity (i.e. Guo et al. 2018); TMT age (i.e. Tanikawa et al., 2017); TMT composition (i.e. Tulung & Ramdani, 2016); TMT heterogeneity in education (i.e. Li et al., 2015) have been separately tested, and there is no model have considered the aspects of TAM characteristics and their impact on the innovation and performance altogether. Thus, the current study provide a considerable theoretical contribution by proposing and a comprehensive picture capturing the most important aspects of TMT characteristics. In

details, This framework is based on the theory of upper echelon, contingency and RBV of the organisations. While the RBV contextualises TMT characteristics as important resources required by organisations to pursue innovation and directly influence their performance, the upper echelon posits that top management need poses certain characteristics such as level of education and experience, which are relevant to organisational performance. This research has contributed to the RBV theory therefore by extending our understanding of these of TMT characteristics as a valuable resource in influencing organisational performance within the context of Saudi Arabia. It extends our understanding of upper echelon by discussing how annual age of TMT members was not relevant in improving organisational performance and therefore posits that all TMT characteristics are relevant as the theory suggest.

It has extend our understanding by demonstrating that even though TMT characteristics have been shown to be relevant in improving organisational performance especially in Western societies, their impact of the construction industry has shown some dichotomy which is however supported by the literature. Age for example was found to be insignificant in influencing organisational performance directly and indirectly despite having a positive effect. Moreover, while the other characteristics have had a significant effect in improving organisational performance, they have done so with varied level of probability, which demonstrates the hierarchical relevance of each characteristics. Given the many results of this analysis, this research shows that DC mediates the effect of TMT on innovation and organisations's performance except for average age.

Empirically, this research has contributed by developing a conceptual framework based on the Upper Echelon and DC and from the review of relevant literature to text the direct and indirect effect of TMT on organisational performance the how DC could mediates the TMT –innovation and organisational performance relationship. The conceptual framework explores SEM to develop testable hypotheses and thereby uncovers the direct and indirect effect of TMT on organisational performance of organisational in the construction industry in Saudi Arabia. The conceptual framework is inconclusive as some of the hypotheses are not supported. The was also the qualitative aspect of the conceptual framework where the purpose was to provide in-depth understanding and explanations of the results of the hypotheses formed and

in order to attain a more accurate and specific causal understanding that led to such results, and to explain the mediating effect of dynamic capabilities on the relationship between TMT characteristics, organisational innovation and organisational performance.

In the literature gap subsection, it has also been also discussed that there is a need to empirically test and validate the relationship between TMT characteristics and DCs as discussed by Proeller et al. (2011). Therefore, another considerable contribution was attained in the current study by providing further quantitative and qualitative evidences from the perspective of developing countries (i.e. Saudi Arabia). This is especially in the light of the fact that the Saudi Construction Sector has a shortage in the current understanding regarding the impact of TMTs of firms on DCs and the level of innovation. This study does not only provide a comprehensive theoretical model but also expand the practical and conceptual horizon of such model over developing countries (i.e. Saudi Arabia) and for specific sitting (i.e. Small and medium sized construction companies) has not been covered before.

It is also worth mentioning that this study was able to enrich the current understanding regarding DCs multidimensional construct in comparison with prior studies that have tested DCs a simple proxies or constructs with which to investigate firms in general (e.g. Boccardelli and Magnusson, 2006; Sawyers, Pretorius, Oerlemans, 2007; Wu, 2006; Rindova and Kotha, 2001; Athreye, 2005). As well as, there was a necessity to identify and empirically validate the main the antecedents to DC which have received a limited interest by prior studies (Hawass, 2010; Teece, 2007; Zollo and Winter, 2002; Eisenhardt and Martin, 2000). Accordingly, this study goes further steps by clearly identify and empirically examine these antecedences at the organisational and social levels within which these capabilities operate.

As discussed in the literature gap subsection, there is a scarcity of literature regarding the mediating impact of DCs and DCs could facilitate the impact of TMT characteristics on the organisational innovation (Hsu et al., 2008; Penrose and Pitelis, 2009). This, in turn, comprises a worth attempt for the current study to provide more qualitative and quantitative evidences supporting the role of DCs as a mediating factor over the Saudi construction sector. Furthermore, the current study was able to reach

another contribution by discussing more the mechanism by which DCs are generated, evolve and die as highly recommended by Eisenhardt and Martin (2000).

Another contribution is the richness of the data. Primary data was collected from top management teams in Riyadh in 2016 and this gives a very rich data that is not in existence. This new data therefore provides an interesting addition to existing knowledge. Apart from the richness of the data, this research adopts a sophisticated method for data analysis (structural equation modelling) to analyse latent variables, check reliability and validity.

8.4.2 Practical Contribution

Besides the theoretical and empirical contribution of this research, this research also presents practical contributions and implications for management in improving performance in construction companies. By revealing the findings of the research, these valuable implications are described in the following sections. Practically, this research provides decision-makers, and practitioners in developing countries in general and especially small- and medium-sized construction companies in Riyadh in the Kingdom of Saudi Arabia, with a strategic tool through which they can assess TMT characteristics from multiple perspectives. The importance of reviewing the strategic tools which influence the performance of TMTs is to help design measures and strategies that can lead to innovativeness in such teams and improve the performance of their organisations. By improving the performance of TMTs, this is likely to also improve the performance of the construction companies as a whole, by ensuring client needs are met. With high levels of client dissatisfaction in the Saudi Arabian construction industry, this research presents a framework that seeks to improve performance which ultimately will lead to customer satisfaction.

Practically, the current study results give clues about the significant role of number of TMT characteristics: Educational Level, Tenure Diversity / Heterogeneity, Functional Experience. Therefore, more interest from construction organizations should be placed to improve these aspects. For example, as a part of their strategic view and investing strategy in their intellectual and human capital, organizations should allow

their employees and give them more opportunities improve their education level. This could be done by sending those employees to the best learning and academic institutions in the KSA or worldwide. As well as, more training programs should be available to the organizations' staff. This will inevitably lead to the development of the knowledge, technical, and functional skills and experience of the workers and thus the expansion of their perceptions and exposure. Accordingly, employees will be more able to do their own contribution to the organizational performance and innovation. Furthermore, such kind of employees education and learning will help to improve the main DCs that they have, and indirectly will enhance both organizations performance and innovation (Bitencourt et al., 2019).

The results also supported the role of Tenure Diversity. Therefore, organizations have to create a positive working climate which allows employees to have more engagement and interactions with each other. By doing so, more sharing and common values, habit, knowledge, and experience will arise by the passage of time among those employees. In this regard, organizations could improve their formal and informal communication system so as to facilitate such interaction and engagement among the employees. As well as, a number of knowledge sharing methods (i.e. socializations and exchange) will help to share and capture explicit and tacit knowledge.

The framework developed from this research forms the basis for identifying Saudi construction industry specific factors that can improve the performance of the construction industry by influencing the dynamic capabilities created by the TMTs. As presented in this research, the framework can be adopted by construction companies in selecting TMTs by considering the specific characteristics that can ensure they achieve innovative solutions for the companies. Knowing the relationship between TMT characteristics, organisational innovation and performance as well as the mediating roles played by dynamic capabilities will help construction organisations in the Saudi Arabian construction industry to develop the necessary capabilities that will have an influence on overall improvement in their companies.

Either the quantitative or qualitative findings supported the crucial role a number of DCs such as sensing opportunities capability, learning capability, integrating

capability and performance. Therefore, these aspects have to be the focus of attention of Saudi construction organizations. In the line with what has been suggested by Lütjen et al. (2019), .capturing innovation solutions require organizations to sense, map, and carefully find the key players and factors over the external environment. Organizations should systematically and regularly scan and analyse their micro and macro area to identify the main threats that could face or opportunities that could utilize (Jantunen et al., 2018).

Organization should also have a more comprehensive picture regarding the key stakeholders (i.e. suppliers; customers, and associated governmental organizations, and intermediaries) who could a direct or indirect contribution to the organization innovation and performance (Klewitz and Hansen, 2014). In this regard, those stakeholders (i.e. suppliers; customers, and associated governmental organizations, and intermediaries) should be engaged in the decision making process, and accordingly, empowering them to be a real value co-creators for the organizational innovation and performance (Lütjen et al., 2019). More sustainable and productive association should be established and enhanced among the employees and TMT members over the entire organizations. It is also important to analyse the current situation of DCs that organizations already have to then improve the current ones and integrate other new ones that organization needs as suggested by Schilke (2014) and Bitencourt et al. (2019).

8.5 Research Limitations and Future Research Recommendations

Conducting research is always constrained by different factors which can impact on the wider acceptability of the research findings. These factors bring limitations to the research and must be acknowledged to form the basis for recommending future research which will either address these challenges or consider other areas which were not covered by the research. This section discusses the limitations of this research and presents the recommendations made for further research.

8.5.1 Research Limitations and Future Research Recommendations

An effort has been made to make this research detailed and comprehensive but inevitably there are some limitations which could be considered as themes to be addressed by future studies such of that

1. The current research only investigated the mediating effect of dynamic capabilities on the relationship between TMT characteristics, organisational innovation and performance in small- and medium-sized companies in Riyadh in the Kingdom of Saudi Arabia. However, there are other variables influencing organizational performance that this research has not considered in its framework. For example, according to systematic literature review study conducted by Schilke et al. (2018), DCs aspects (i.e. Coordinating; reconfiguring; Alliancing; new product; development; mergers; acquisitions; and internationalization) are not considered in the current study. This, in turn, restricts the current study ability to provide a comprehensive picture about the role of DCs. Therefore, future research should do more analyses of the prior literature so as to be able to identify and empirically examine more antecedents or factors influencing innovation and performance in small- and medium-sized construction companies in Riyadh in the Kingdom of Saudi Arabia, since it is recommended that the TMT characteristics and dynamic capabilities should be investigated on a larger scale in future research.

2. Since this research was based on Upper Echelons Theory, future research could extend this theory and apply it to another sector in the context of the Kingdom of Saudi Arabia. Such theories that could be considered in this regard, organizational learning theory (i.e. Denford; 2013; Di Stefano et al., 2010); Evolutionary economics (i.e. Augier and Teece, 2008); Resource-base view of the firm (i.e. Kim and Mahoney, 2010).

3. The current study model does not address the moderation impact of such factors (i.e. organization structure; Environmental Dynamism; Interorganizational structure; Geographical area; size; and Strategy) that

could shape the relationships among the antecedences and the main consequences. This therefore created ambiguity about understanding how the model factors could influence each other. Therefore, future studies should place more attention for examining the moderation effect of such factors (i.e. organization structure; Environmental Dynamism; Interorganizational structure; Geographical area; size; Strategy) and provide more understanding how these factors could shape the relationships between innovation; performance, and their antecedences.

4. The non-significant influence of a number of current study model (i.e. Average Age; Coordinating Capability; and exploitative, explorative Innovation). Accordingly, a a question emerged the validity and applicability of the current factors in the construction Saudi context. More examination of these non-significant factors could be undertaken by future studies for the large and big construction firms in the KSA or different sectors; and over different countries. This si very important step by fture studies to discover if these factors will behave similarly as non-significant or could have more crucial role in predicting innovation and organization performance by changing the sector; the size; and the country of study.

5. Even though mixed method approach was adopted in the current study, there nature of the current study especially the quantitative part is cross sectional. Accordingly, there is a concern pertaining to the applicability and reliability of the current study results on the long term. Accordingly, future studies could adopt a longitudinal study approach to see if the impact of the current study factors could change or will have the same manner of effect. This especially in the light of the big economical, technological, and cultural change that takes place over the context of Saudi Arabia.

6. The generalizability of the framework should be approach very carefully because it consist of just organizations within the construction industry. These organizations may have certain characteristics that could not be

applicable to other organizations. But the model is robust and it will be good to test it in other sector. Therefore, future studies could expand the current study model by considering large size of construction organizations. As well as, different types of organizations from different sectors (service; tourism; energy; and agriculture; education) should be considered by future studies to expand the theoretical horizon of the current study model.

7. The population sample was limited to some extent. The research is culture-specific to Saudi Arabia so care must be taken when applying the findings to other cultures. Future researchers might consider enlarging the sample population in an effort to eliminate misleading results. It could be useful for future studies if they could apply cross cultural studies that will enable to compere the results of the KSA context with other countries. Such comparison cultural study could be undertaken between Saudi Arabia and another developing country with different cultural background or even with another highly developed country. In this regard. A number of cultural aspects (power distance, collectivism versus individualism; Masculinity versus Femininity; longe term orientation versus short term orientation; the Uncertainty Avoidance; and Indulgence versus restraint) are worth to be addressed and considered by future studies.

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Appendix

1. The Research Questionnaire

The Research Questionnaire | استبانة بحث ميداني

Mr / Ms ..... Greetings

The Researcher aims to carry out a study entitled "**Investigating the relationship between top management teams' characteristics and organisational innovation: The Mediating role of dynamic capabilities**". The study mainly aims to investigate mediating role of dynamic capabilities on the relationship between top management team's characteristics, organisational innovation and Performance. Your participation in this research project is completely voluntary. Your responses will remain confidential and anonymous. If you agree to participate in this project, please answer the questions on the questionnaire as best you can.

يهدف الباحث القيام بدراسة بعنوان "دراسة الاثر الوسيط للقدرات الديناميكية في العلاقة بين خصائص فريق الإدارة العليا والإبداع المنظمي". حيث تهدف الدراسة إلى بيان الأثر الوسيط للقدرات الديناميكية في العلاقة بين خصائص فريق الإدارة العليا، الإبداع المنظمي والاداء. إذ إن مشاركتكم في مشروع الدراسة الحالية هو طوعي تماماً. علماً بإن استجاباتكم ستعامل بسرية تامة. إن لم يكن لديك أي مانع للمشاركة في تحقيق أهداف الدراسة الحالية، فإنني أتوجه لكم راجياً الإجابة عن كافة الاسئلة في الإستبانة بأفضل ما لديك.

Researcher	**Supervisor**
Bader Aldawaish	DR. Abraham Althonayan

Section One: TMT characteristics

To what extent do you think that the following TMT characteristics influence the performance of your organization?

No	Characteristics	Answer alternatives بدائل الإجابة					الخصائص	ت
		very low effect	Low effect	Moderately effect	high effect	very high effect		
		مؤثرة منخفضة جداً	مؤثرة بدرجة منخفضة	مؤثرة بدرجة متوسطة	مؤثرة بدرجة عالية	مؤثرة بدرجة عالية جداً		
1	Age						العمر	1
2	Educational Level						المستوى التعليمي	2
3	Tenure Diversity / Heterogeneity						عدد سنوات العضوية بفريق الإدارة العليا	3
4	Functional Experience						الخبرة الوظيفية	4

To what extent do you think that the following TMT characteristics influence the Innovation of your organization?

No	Characteristics	Answer alternatives بدائل الإجابة					الخصائص	ت
		very low effect	Low effect	Moderately effect	high effect	very high effect		

		مؤثرة منخفضة جداً	مؤثرة بدرجة منخفضة	مؤثرة بدرجة متوسطة	مؤثرة بدرجة عالية	مؤثرة بدرجة عالية جداً		
1	Age						العمر	1
2	Educational Level						المستوى التعليمي	2
3	Tenure Diversity / Heterogeneity						عدد سنوات العضوية بفريق الإدارة العليا	3
4	Functional Experience						الخبرة الوظيفية	4

To what extent do you think that the following TMT characteristics influence the Dynamic Capabilities of your organization?

No	Characteristics	Answer alternatives بدائل الإجابة					الخصائص	ت
		very low effect	Low effect	Moderately effect	high effect	very high effect		
		مؤثرة منخفضة جداً	مؤثرة بدرجة منخفضة	مؤثرة بدرجة متوسطة	مؤثرة بدرجة عالية	مؤثرة بدرجة عالية جداً		
1	Age						العمر	1
2	Educational Level						المستوى التعليمي	2
3	Tenure Diversity / Heterogeneity						عدد سنوات العضوية بفريق الإدارة العليا	3
4	Functional Experience						الخبرة الوظيفية	4

Section Two: Please state your opinion on the following items to determine the extent of agreement on what is contained in each of the item in **Dynamic Capabilities.**

No	Item	Answer alternatives بدائل الإجابة					الفقرة	ت
		Strongly disagree	Disagree	Neutral	Agree	Strongly Agree		
		لا أوافق على الإطلاق	لا أوافق	محايد	أوافق	أوافق بشدة		
Sensing							قدرة إستكشاف الفرص ***Opportunities Capability***	
1	Top management teams scan the environment to identify new business opportunities						يقوم فريق الإدارة العليا بإجراء مسح بيئي للتعرف على فرص العمل الجديدة	1
2	Top management teams review the business environment to know the likely effect of changes in firm business environment on customers						يقوم فريق الإدارة العليا بمراجعة بيئة الأعمال لتعرف الأثر المحتمل للتغيرات على سلوكيات عملائها	2
3	Top management teams review the service development efforts to ensure they are in line with what the customers want						يقوم فريق الإدارة العليا بمراجعة جهود تطوير الخدمات للتأكد من أنها تتماشى مع حاجات ورغبات الزبائن	3
4	Top management teams devote a lot of time implementing ideas for new service and improving the existing products						يقوم فريق الإدارة العليا بتكريس الكثير من الوقت اللازم لتطبيق أفكار لخدمات جديدة وتحسين الخدمات الحالية	4
							قدرة التعلم ***Learning Capability***	
5	Top management teams have effective routines to identify, value, and import new information and knowledge						لدى فريق الإدارة العليا إجراءات فعالة لتحديد القيمة والحصول على معارف جديدة	5
6	Top management teams have adequate routines to assimilate new information and knowledge						لدى فريق الإدارة العليا إجراءات كافية لاستيعاب المعارف الجديدة	6

7	Top management teams are effective in transforming existing information into new knowledge						لدى فريق الإدارة العليا فعالية في تحويل المعلومات إلى معرفة جديدة	7
8	Top management team are effective in utilizing knowledge into new services						لدى فريق الإدارة العليا فعالية في الاستفادة من المعرفة في تطوير خدمات جديدة	8
9	Top management teams are effective in developing new knowledge that has the potential to influence service development						لدى فريق الإدارة العليا فعالية في تطوير معرفتها للتأثير على تطوير الخدمات	9

No	Item	Answer alternatives بدائل الإجابة					الفقرة	ت
		Strongly disagree	Disagree	Neutral	Agree	Strongly Agree		
		لا أوافق على الإطلاق	لا أوافق	محايد	أوافق	أوافق بشدة		
قدرة التكامل ***Integrating Capability***								
10	Top management teams are forthcoming in contributing our individual input to the group						يساهم فريق الإدارة العليا بشكل فعال في المدخلات الفردية لمجموعات العمل	10
11	Top management teams have a global understanding of each other's tasks and responsibilities						لدى فريق الإدارة العليا إستيعاب لكافة المهام والمسؤوليات المناطة بهم	11
12	Top management teams are fully aware who in the group has specialized skills and knowledge relevant to our work						لدى فريق الإدارة العليا وعي لمجموعات العمل متخصصة المهام والمهارات ذات الصلة بطبيعة عملنا	12
13	Top management team carefully interrelate their own actions to each other to meet changing conditions						يربط فريق الإدارة العليا بعناية الإجراءات الخاصة بعضها ببعض لتلبية الظروف المتغيرة	13
14	Top management teams manage to successfully interconnect their activities						يدير فريق الإدارة العليا بشكل فعال الأنشطة المترابطة بنجاح	14
قدرة التنسيق ***Coordinating Capability***								
15	Top management teams ensure that the output of our work is synchronized with the work of others						يتأكد فريق الإدارة العليا من أن نتائج أعمالنا تتزامن مع أعمال الآخرين	15
16	Top management teams ensure an appropriate allocation of resources (e.g., information, time, reports) within our group						يتأكد فريق الإدارة العليا من التخصيص الملائم للموارد ضمن مجموعات العمل	16
17	Top management teams are assigned to tasks commensurate with their task-relevant knowledge and skills						يقوم فريق الإدارة العليا بتحديد المهام التي تتناسب مع المعارف والمهارات ذات الصلة بعملنا	17
18	Top management teams ensure that there is compatibility between group members expertise and work processes						يتأكد فريق الإدارة العليا من أن يكون هناك توافق بين خبرة أعضاء مجموعات العمل وإجراءات العمل	18
19	Overall, Top management team are well coordinated						بشكل عام، يؤكد فريق الإدارة العليا على التنسيق الفعال بين مجموعات العمل	19

Section Three: Please state your opinion on the following items to determine the extent of agreement on what is contained in each of the item in **Organizational Innovation.**

No	Item	Answer alternatives بدائل الإجابة					الفقرة	ت
		Strongly disagree	Disagree	Neutral	Agree	Strongly Agree		
		لا أوافق على الإطلاق	لا أوافق	محايد	أوافق	أوافق بشدة		
الإبداع الإستغلالي ***Exploitative Innovation***								
20	Top management group refine the provision of existing services						يؤكد فريق الإدارة العليا على توفير الخدمات الحالية بشكل مميز	20
21	Top management group implement small adaptations to existing services						يؤكد فريق الإدارة العليا على التعديلات البسيطة على الخدمات الحالية	21
22	Top management group introduce improved, but existing services for out local market						يقوم فريق الإدارة العليا بإجراء تحسينات مستمرة للخدمات الحالية	22
23	Top management group improve their provision's efficiency of services						يؤكد فريق الإدارة العليا على تحسين كفاءة تقديم اخدمات	23
24	Top management group increase economies of scales in existing markets						يهتم فريق الإدارة العليا بزيادة إقتصاديات الحجم في الأسواق الحالية	24
25	Top management group in firm expand services for existing clients						يؤكد فريق الإدارة العليا على توسيع الخدمات المقدمة للعملاء الحاليين	25
الإبداع الإستكشافي ***Explorative Innovation***								
26	Top management group firm accept demands that go beyond existing and services						فريق الإدارة العليا لشركتنا يتقبل الطلبات التي تتجاوز الخدمات الحالية	26
27	Top management group invent new services						يسعى فريق الإدارة العليا لإبتكار خدمات جديدة	27
28	Top management group experiment with new services that are completely new to the firm						لدى فريق الإدارة العليا تجربة كبيرة مع الخدمات الجديدة والتي تعتبر معاصرة تماماً	28
29	Top management group commercialize services that are completely new to the firm						يقوم فريق الإدارة العليا بتسويق الخدمات الجديدة للشركة	29
30	Top management group utilize new opportunities in new markets						يستفيد فريق الإدارة العليا من الفرص الجديدة في الأسواق الجديدة	30
31	Top management group in firm are uses new distribution channels						يستخدم فريق الإدارة العليا قنوات توزيع جديدة	31

Section Three: Please state your opinion on the following items to determine the extent of agreement on what is contained in each of the item in **Performance.**

No	Item	Answer alternatives بدائل الإجابة					الفقرة	ت
		Much Worse	Worst	Equal	Best	Much better		
		أسوأ بكثير	أسوأ	متساوي	أفضل	أفضل بكثير		
32	The sales growth position relative to our principal competitor is						نمو المبيعات مقارنة بالمنافسين هو	32
33	My satisfaction with sales growth rate is:						رضاي عن نمو المبيعات هو	33
34	The market share gains relative to our principal competitors are:						مكاسب الحصة السوقية مقارنة بالمنافسين هو	34
35	The return on corporate investment position relative to our principal competition is						العائد على الإستثمار مقارنة بالمنافسين هو	35
36	My satisfaction with the return on corporate investment is:						رضاي عن العائد على الإستثمار هو	36
37	My satisfaction with return on sales is						رضاي عن العائد على المبيعات هو	37
38	The net profit position relative to our principal competitor is						صتفي الربح مقارنة بالمنافسين هو	38

Mr / Ms ..... Greetings

The Researcher aims to carry out a study entitled "**Investigating the relationship between top management teams' characteristics and organisational innovation: The Mediating role of dynamic capabilities**". The study mainly aims to investigate mediating role of dynamic capabilities on the relationship between top management team's characteristics, organisational innovation and Performance. Your participation in this research project is completely voluntary. Your responses will remain confidential and anonymous. If you agree to participate in this project, please answer the questions on the questionnaire as best you can.

يهدف الباحث القيام بدراسة بعنوان "دراسة الاثر الوسيط للقدرات الديناميكية في العلاقة بين خصائص فريق الإدارة العليا والإبداع المنظمي". حيث تهدف الدراسة إلى بيان الأثر الوسيط للقدرات الديناميكية في العلاقة بين خصائص فريق الإدارة العليا، الإبداع المنظمي والاداء. إذ إن مشاركتكم في مشروع الدراسة الحالية هو طوعي تماماً. علماً بإن استجاباتكم ستعامل بسرية تامة. إن لم يكن لديك أي مانع للمشاركة في تحقيق أهداف الدراسة الحالية، فإنني أتوجه لكم راجياً الإجابة عن كافة الاسئلة في الإستبانة بأفضل ما لديك.

Q1: What is the level of Performance in your company?

☐ High

☐ Medium

☐ Limit

1. ما مستوى أداء شركتكم؟

☐ عال

☐ وسط

☐ منخفض

Q2: What are the drivers to achieve high levels of performance in your company?

☐ Top Management support
☐ Dynamic Capabilities
☐ Innovation
☐ Others

2. ما هي موجهات تحقيق مستويات أداء عالية لشركتكم؟

☐ دعم الإدارة العليا
☐ القدرات الديناميكية
☐ الإبداع
☐ أخرى

Q3: What is the level of organizational innovation in your company?

☐ High

☐ Medium

☐ Limit

3. ما مستوى الإبداع المنظمي لشركتكم؟

☐ عال

☐ وسط

☐ منخفض

Q4: What are the sources of organizational innovation for your company?

☐ Top Management Characteristics
☐ Internal Support for organizational innovation
☐ External Support for organizational innovation

4. ما هي مصادر الإبداع المنظمي لشركتكم ؟

☐ خصائص الإدارة العليا
☐ الدعم الداخلي للإبداع المنظمي
☐ الدعم الخارجي للإبداع المنظمي

Q5: Which are the sources of organizational innovation that most influential on your company's?

5. ما هي مصادر الإبداع المنظمي الأكثر تأثيراً على شركتكم ؟

☐ Top Management Characteristics
☐ Internal Support for organizational innovation
☐ External Support for organizational innovation

☐ خصائص الإدارة العليا
☐ الدعم الداخلي للإبداع المنظمي
☐ الدعم الخارجي للإبداع المنظمي

Q6: What is your need to organizational innovation?

6. ما حاجتكم إلى الإبداع؟

……...
……...
……...
……...

Q7: To how well the Top Management Team contribute to achievement the Satisfactory Performance?

7. إلى أي مدى يساهم فريق الإدارة العليا في تحقيق أداء مرضي؟

☐ High
☐ Medium
☐ Limit

☐ عال
☐ وسط
☐ منخفض

Q8: To how well the Top Management Team contribute to achievement the Organizational Innovation?

8. إلى أي مدى يساهم فريق الإدارة العليا في تحقيق الإبداع المنظمي؟

☐ High
☐ Medium
☐ Limit

☐ عال
☐ وسط
☐ منخفض

Q9: To how well the Top Management Team enhance Dynamic Capabilities in your company?

9. إلى أي مدى يساهم فريق الإدارة العليا في تعزيز القدرات الديناميكية لشركتكم؟

☐ High
☐ Medium
☐ Limit

☐ عال
☐ وسط
☐ منخفض

Q 10: To how well the Dynamic Capabilities contribute to achievement the Organizational Innovation (exploitative innovation and explorative innovation) in your company? How?

10. إلى أي مدى تساهم القدرات الديناميكية في تحقيق الإبداع المنظمي (الإستكشافي والإستغلالي) لشركتكم؟ وكيف؟

☐ High
☐ Medium
☐ Limit

☐ عال
☐ وسط
☐ منخفض

……...
……...
……...
……...

Q 11: To how well the Dynamic Capabilities enhance the Performance in your company? How?.

☐ High

☐ Medium

☐ Limit

11. إلى أي مدى تعزز القدرات الدينتاميكية أداء شركتكم؟ وكيف؟

☐ عال
☐ وسط
☐ منخفض

……..
……..
……..
……..

Q 12: From your opinion, what is the importance of Organizational Innovation in achieving high levels of performance?

12. من وجهة نظرك، ما أهمية الإبداع المنظمي في تحقيق مستويات أداء عالية؟

……..
……..
……..
……..

Q13 : From your opinion, what is the role played by Dynamic Capabilities in achieving Organizational Innovation and Performance?

13. من وجهة نظرك، ما دور القدرات الديناميكية في تحقيق الإبداع المنظمي والأداء؟

……..
……..
……..
……..

Ethical Approval

College of Business, Arts and Social Sciences Research Ethics Committee
Brunel University London
Kingston Lane
Uxbridge
UB8 3PH
United Kingdom

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7 December 2017

LETTER OF APPROVAL

Applicant: Mr Bader Aldawaish

Project Title: Investigating the mediating effect of dynamic capabilities on the relationship between top management team's characteristics and organisational innovation

Reference: 7314-LR-Dec/2017- 9140-2

Dear Mr Bader Aldawaish

The Research Ethics Committee has considered the above application recently submitted by you.

The Chair, acting under delegated authority has agreed that there is no objection on ethical grounds to the proposed study. Approval is given on the understanding that the conditions of approval set out below are followed:

- The agreed protocol must be followed. Any changes to the protocol will require prior approval from the Committee by way of an application for an amendment.

Please note that:

- Research Participant Information Sheets and (where relevant) flyers, posters, and consent forms should include a clear statement that research ethics approval has been obtained from the relevant Research Ethics Committee.
- The Research Participant Information Sheets should include a clear statement that queries should be directed, in the first instance, to the Supervisor (where relevant), or the researcher. Complaints, on the other hand, should be directed, in the first instance, to the Chair of the relevant Research Ethics Committee.
- Approval to proceed with the study is granted subject to receipt by the Committee of satisfactory responses to any conditions that may appear above, in addition to any subsequent changes to the protocol.
- The Research Ethics Committee reserves the right to sample and review documentation, including raw data, relevant to the study.
- You may not undertake any research activity if you are not a registered student of Brunel University or if you cease to become registered, including abeyance or temporary withdrawal. As a deregistered student you would not be insured to undertake research activity. Research activity includes the recruitment of participants, undertaking consent procedures and collection of data. Breach of this requirement constitutes research misconduct and is a disciplinary offence.

Professor David Gallear

Chair

College of Business, Arts and Social Sciences Research Ethics Committee
Brunel University London

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