

**A design thinking-based Framework for effective business
excellence outcomes in the public sector**

الإطار المعتمد على التفكير التصميمي لتحقيق نتائج فعالة للتميز المؤسسي في
القطاع العام

by

GEBREEL AHMAD ALMOMANY

A thesis submitted in fulfilment

of the requirements for the degree of

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at

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Gebreel Ahmad Almomany

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October 2021

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A design thinking-based framework for effective business excellence outcomes in the public sector

Abstract

Business excellence has a proven history of making real differences in the outcomes of organizations. However, most scholarly published research is limited to the application of excellence models in the private sector, because most excellence models are only adapted to fit the context of the public sector organizations. This study adds value by focusing on investigating the relationship between the independent variable of attitude, knowledge, actions, and excellence and the business excellence implementation outcomes. Furthermore, it examines if this relationship is moderated by design thinking and its determinants of *empathise*, *define*, *ideate*, and *prototype*.

This research used a questionnaire survey from the population of leaders and senior level managers listed at Dubai local Government Departments. A sample of 141 senior managers were selected through convenience sampling who completed the survey. Positive relationships were found between knowledge, actions, attitude and excellence with business excellence implementation outcomes. The impact of attitude and knowledge on excellence implementation outcomes is found to be moderated positively by design thinking and its determinants. However, actions were not moderated by design thinking and its determinants for their relationship with business excellence outcomes. This anomalous moderating influence of design thinking determinants is explained by the changes in work environment and organisational priorities during the persisting COVID-19 pandemic. Based on these results, a design thinking-based framework for business excellence implementation in the public sector is recommended by the researcher, which suggests that managers should promote factors and criteria of excellence that are suited to their organizational context. This is in addition to empirical and academic recommendations.

Key words: Business excellence, Attitude, Knowledge, Action, Design thinking, Outcomes.

الإطار المعتمد على التفكير التصميمي لتحقيق نتائج فعالة للتميز المؤسسي في القطاع العام

نبذة مختصرة:

أحدث التميز المؤسسي نقلة نوعية في أداء ونتائج المؤسسات عبر تاريخ تبنيه وتطبيقه من قبلها، حيث وجدت نماذج التميز ليتم تطبيقها في القطاع الخاص أولاً، ومن ثم تم تعديلها وتكييفها لتلائم بيئة وطبيعة القطاع العام لاحقاً. وهذا انعكس بأن الدراسات والأبحاث في مجال إدارة الجودة الشاملة والتميز ركزت في معظمها على قياس وتطبيق هذه المفاهيم في القطاع الخاص، وأن دراسة هذه الجوانب في القطاع العام اخذ أهمية أقل من قبل الباحثين. يضيف هذا البحث قيمة من خلال التركيز على كيفية زيادة فعالية تطبيق مفاهيم التميز المؤسسي من خلال دراسة العلاقة بين متغيرات الدراسة المستقلة (التوجه نحو التميز، والمعرفة بمفاهيم التميز، والتنفيذ الفعلي للمتطلبات كل على حدة وجميعها معاً) مع عوائد تطبيق التميز المؤسسي كمتغير تابع. وفيما إذا كانت هذه العلاقة تتأثر بالتفكير التصميمي ومحدداته (التعاطف، التعريف، التفكير والنموذج الأولي) كمتغير وسيط.

اتبعت الدراسة المنهجية الكمية في البحث، حيث قام الباحث بتطوير استبيان لجمع البيانات اللازمة لاختبار الفرضيات من مجتمع الدراسة المتمثلة بفئة القادة والمدراء في الدوائر المحلية لحكومة دبي، وقام باستخدام أسلوب العينة العشوائية الملائمة لاختيار عينة من 141 مدير والذين قاموا بتعبئة الاستبيان بالكامل. وقد اثبتت الدراسة وجود علاقة إيجابية بين متغيرات الدراسة المستقلة (التوجه والمعرفة والتنفيذ كل على حدة وجميعها معاً) مع المتغير التابع عوائد تطبيق التميز المؤسسي. وقد أظهرت نتائج الدراسة أن العلاقة بين المتغير المستقل المعرفة والمتغير التابع عوائد تطبيق التميز المؤسسي تتأثر إيجاباً بوجود التفكير التصميمي ومحددات التفكير التصميمي (التعاطف، التعريف، التفكير والنموذج الأولي)، كما اثبتت الدراسة أن ذلك ينطبق على العلاقة بين المعرفة كمتغير مستقل مع المتغير التابع بأن هذه العلاقة تتأثر إيجاباً بوجود التفكير التصميمي ومحدداته كمتغير وسيط. بينما اثبتت الدراسة أنه لا يوجد تأثير ذو دلالة إحصائية على العلاقة بين المتغير المستقل التنفيذ الفعلي لمتطلبات التميز مع المتغير التابع عوائد تطبيق التميز بوجود التفكير التصميمي ومحددات التفكير التصميمي كمتغير وسيط، وقد فسر الباحث هذه النتيجة غير المتوقعة للتغيرات في بيئة وطبيعة تأدية الاعمال في مؤسسات القطاع العام والتي رافقة جائحة فيروس كورونا 19 وما تطلبه ذلك من تغيير في أولويات هذه المؤسسات.

بناءً على نتائج هذه الدراسة قام الباحث بتقديم إطار معتمد على التفكير التصميمي لتحقيق نتائج فعالة للتميز المؤسسي في القطاع العام، والذي يقترح على القادة تبني معايير ومبادئ التميز التي تناسب بيئة مؤسساتهم. هذا بالإضافة لمجموعة من التوصيات العملية والأكاديمية.

الكلمات الرئيسية: التميز المؤسسي، التوجه نحو التميز، المعرفة بمفاهيم التميز، التنفيذ الفعلي، التفكير التصميمي، نتائج التميز.

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List of abbreviations

Abbreviation	Full text
BUID	British University in Dubai
DOS	director of the study
A	Attitude toward business excellence
K	Knowledge of business excellence
AC	Action on business excellence
EM	Empathise
DI	Define implementation problem
II	Ideas for implementation
PR	Prototype of solutions
BE	Excellence implementation Outcomes
Ex	Excellence
DT	Design thinking
UAE 4G EM	Unite Arab Emiratis fourth generation excellence model
SKGEP	Sheikh Khalifa government excellence program announced
DGEP	Dubai Government Excellence program
EFQM	European Foundation for Quality Management
DP	Deming Prize
MBNQA	Malcolm Baldrige National quality award
TQM	Total Quality Management
CWQC	Company Wide Quality Control
QI	Quality Inspection
QC	Quality Control
PC	Process Control
QA	Quality Assurance
HR	Human Resources
DEWA	Dubai Electricity and Water Authority
DP	Dubai Police
BE	Business Excellence implementation outcomes
BEM	Business Excellence Model
OE	Operational Excellence
PE	Process Excellence
PDCA	Deming cycle (Plan, Do, Check, Act)
BPIR	Business Performance Improvements Resources
RADAR System	R: refers to Results, A: refers to approach, D: refers to deployment: AR: refers to assessment and refinement
NIST	National Institute of Standards and Technology
CLT	Cognitive Load Theory
KAI Award	King Abdullah II award for government performance excellence and transparency
AFIs	Area For Improvements

1. Chapter 1 Introduction

Modern organizations operate in an increasingly competitive and highly uncertain world. This uncertainty leaves them with little choice but to pay more attention to innovation and creative generation of ideas, which can keep them competitive and increase their longevity. Organizations need to incorporate innovation and creativity while maintaining their customers' and employees' satisfaction, while not compromising on their products' growth and the quality of their services. These requirements point towards a strong need for business excellence (Dinu, 2017). Today, excellence is a critical issue for organizational survival equally applicable to both public and private sectors.

Business excellence is defined simply as all those practices and interventions that can facilitate the operation of a company to become the best model of itself (Adamek, 2018). Earlier referred as total quality management or TQM, business excellence is considered to be important as it encourages, and even, celebrates the outstanding practices and performances in organizations. At the macro level, implementing business excellence requirements and adopting its practices enhance a country's competitive advantages and leads to the creation of a sustainable world. Therefore, being recognized for business excellence is one of the greatest achievements for any organization (Wen *et al.*, 2016; Lasrado, 2018).

Some countries have already engaged in the process of adopting business excellence practices within their public sector. The public sector in the UK, for example, has been advocating for business excellence for the past two decades (Roberts *et al.*, 2016). Similarly, the Asian Productivity Organization (APO) has been working hard to introduce and sustain the business excellence framework in countries in the Asia-Pacific region (Mann, Mohammad & Agustin, 2014). From the Japan Quality Award Criteria to China's Quality Award Framework, and to

Singapore and Malaysia's Business Excellence framework, the organization is working actively to promote, consolidate, and share best practices in business excellence in the region. These are just a couple of examples of the many initiatives that are being taken across the globe to encourage and promote business excellence in the public sector and government organizations. At the same time, there is a dearth of literature about how to implement business excellence models in this sector as most studies focus on the private sector which has a very different mode of functioning. This study reviews the existing research investigating the implementation of excellence in the public sector and government organizations which may differ in their degree of formalization (Tickle, Mann & Adebajo, 2016). For the purposes of this study, the public sector includes any entity or organization that is owned by the government. The aim of this introductory chapter is to provide an overview of the research undertaken to develop this thesis, including the background of the study, the definition of the research problem, its aim, objectives, questions, and the significance of the study. The chapter further includes the research gap which establishes the need for the study and the limitations.

1.1 Philosophy and definition of quality

Quality is the degree of compliance to predefined and agreed standards. It is measured by comparing the actual performance against the agreed standards to identify any deviations or mistakes. Fred Smith, the CEO of FedEx Corp defines quality as 'the performance to a standard expected by the customer' (Goetsch & Davis, 2014, p. 21). For the company Boeing, quality means providing the end user with reliable products and services that not only meet but exceed their needs and expectations. The United States Department of Defence defines quality as doing the right thing right from the start with continuous improvement and raising the satisfaction levels of the customers. As a result, quality can be seen as an active situation related to human resources,

processes, services, and products in addition to meeting the needs and expectations of the end users and enhancing the generation of outstanding values

Gryna and Juran (1998) have indicated that, among many meanings of quality, the following two definitions are of importance, and hence, critical for effective management. The first definition terms quality as those features of products which meet customer needs, and thereby, provide customer satisfaction. This definition relates quality directly to the revenue. Meeting the needs and expectations of the customers helps managers to raise the level of customer satisfaction which is reflected in higher demand for the product in the market, ultimately, resulting in higher revenue. The real profit for any organization, whether it is in the public or private sector, is the happiness and satisfaction of customers. This is because an increase in level of customer satisfaction increases both the tangible and intangible rewards for the organization. Therefore, organizations that want to achieve excellence listen to their customers and provide a level of quality in product and service that far exceeds their needs and expectations to help maximize their own profits (Zeithaml, Bitner & Gremler, 2018).

Another definition terms quality as the freedom from deficiencies that is freedom from errors that require doing work repetitively or that result in field failures, customer dissatisfaction, customer claims, and other issues (Madu, 2012).

Quality is directly related with reduction in production cost. Rework means loss of time, cost, and efforts for the managers and the employees. Additionally, customer dissatisfaction leads to forced changes in the product and services to meet the customers' needs and solve their complaints which further increase costs.

From this analysis of its definitions, we find that quality is mostly about focusing on product features, service standards, people satisfaction, process efficiency, and environment protection that directly affect the relationship with the customer. Moreover, quality control helps an organization to reach a level of customer satisfaction which maximizes its revenues while minimizing the cost of products and services. Therefore, quality is profit oriented. However, this focus on profit in the short-term completely discounts the more important objective of managing the organization to ensure outstanding results in different areas that are needed to raise its competitiveness. This raises the need for a TQM which has a much wider scope than only quality control of products and services. The following table which is adapted from Goetsch and Davis (2014) illustrates the transformation from the traditional view of quality to total quality:

Traditional Quality	Total Quality
Process performance is evaluated by errors in parts per hundred of products	Process performance is evaluated by errors in parts per million of products
The focus is on corrective actions after the occurrence of the problems	The focus is on preventing problems from occurring by continuously improving processes, people, and products.
Workers are negative	Workers have the power, knowledge, and skills to take the right decisions for performing their tasks effectively and efficiently
One improvement per employee expected per year	Ten improvements per employee expected per year
The focus is on short-term profit	Profit in the long-term is targeted
Continuous conflict between quality and productivity	The by-product of continuous improvement of the quality is the raising of the level of productivity
Satisfying the customer	Exceed the needs and expectations of the customers

The inspections of quality are within product	The determination of quality is through processes, products, and services
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Table 1. 1 The transformation from a traditional view of quality to total quality

As a result, the focus of quality has now shifted to total quality, which has a wider scope and includes not only the product, but also the process and people in ensuring that mistakes are prevented from happening, customer satisfaction is maximized, and the organization is able to deliver a performance which exceeds expectations.

1.2 The concept of Total Quality Management (TQM)

The concept of Total Quality Management (TQM) was first introduced by Edward Deming in the 1950's (Madu, 2012). Deming's thoughts were rejected by the industries in the United States but accepted and adopted with great appreciation in Japan where efforts were ongoing to rebuild the industry after the Second World War. The results of implementing TQM in Japan were surprising and quickly changed TQM from a failure to a success.

While traveling from the USA to Japan in the 1950's and from Japan to the western countries in the 1980's and 1990's, Dahlgaard-Park (2011) documented quality management and indicated that he witnessed TQM develop during his travels between the east and the west. It developed from a thin quality control statistics-based method to an artificial management trend named TQM .

In recent years, TQM has evolved greatly. Dahlgaard-Park *et al.* (2013) defined it as a comprehensive management system that includes three sub components: effectiveness, quality of work environment, and efficiency. The root of efficiency part is located within the operation management, process control and engineering, and the research of operations. The main stress points in this area are the focus on continuous improvement and tracking the level of efficiency.

Quality of work environment and collaboration is achieved through empowering and motivating team members and building team spirit; this part is associated with the HR management school. Attaining effectiveness is associated with the strategic interests and correlated to matters such as long-term purposes, profit, and market share. The main perceptions in this area are the vision, mission, strategy and benchmark (Costin, 1994; Dahlgaard-Park, 2011, 2011).

The two schools of HR management and strategic management were added for the framework of TQM by the Japanese as a result of quality development that was initiated in Japan in the period from the 1950's to the 1980's. The Japanese approach to ensure the evolution of quality management in this period started with the interpretation, followed by understanding, practicing, and further development of the TQM concept. This resulted in "Company Wide Quality Control" (CWQC), which was achieved by practicing the above approach of the Japanese (Martínez-Lorente, Dewhurst & Dale, 1998).

TQM became a comprehensive managerial system with strong short- and long-term objectives and vision after the term CWQC changed to TQM in the 1980's. From the evolutionary point of view, TQM can be imagined as a child born due to the marriage or coming together of the East and the West. However, the Japanese were the first to develop what became known as 'TQM' in pursuit of improving the process of manufacturing. TQM may be considered as a revolution in the management field (Dahlgaard-Park, 2011). This conclusion is in line with the findings of Wruck and Jensen (1994, p. 248) who stated that "*TQM is a science and art of organizational management, the practice of value and strength while creating sustainable development, excellence, and success of an organization and society*". Therefore, TQM revolutionized the manufacturing industry.

Still, it was not easy to define TQM with no universal definition fitting the requirements of all organizations (Lau & Anderson, 1998; Dilawo & Salimi, 2019). For example, Al-Swidi *et al.* (2019, p. 248) define TQM as “*a management philosophy that considers all the aspects of the operation in an organization*”; while for Zairi and Youssef. (1995, p. 4) it is

“an effort to continuously improve the overall performance of an organization through a flexible organization structure and empowered and developed staff in a context of clearly identified objectives, confirming consistency and focusing on customer happiness”.

Oakland (2011) indicates that TQM is a comprehensive and sensitive methodology that helps to enhance the level of effectiveness, the ability to compete, and build elasticity at all levels where it is practiced. Other researchers have defined TQM as an attempt to continuously improve business excellence where the focus is to reach the highest level of customer satisfaction with a predefined amount of quality culture, skills, and resources in an organization (Bou-Llusar *et al.*, 2009; Goetsch & Davis, 2014). Dale (2003) provides a simple definition for TQM as an enterprise where everyone, at all levels, within the organization has a responsibility to enhance quality.

As a result, there are many definitions of TQM which may differ in certain aspects based on the background of the researcher and their research focus. These definitions, however, include three components in common which are: effectiveness, efficiency, and continuous improvement. The continuous improvement component is a critical factor to gain competitive advantages over other organizations through effectiveness and efficiency.

However, for the purpose of this study, Zairi and Youssef’s (1995) definition which indicates that TQM is about doing the right things right from the first time and repeating this every time is the most pertinent as it includes all aspects of an organization’s work. The right things need to be

identified clearly; in the organization's context, it is the vision, mission, and strategic objectives. Everyone in the organization at different levels must know clearly what is needed from them or what they are required to do.

Some other important aspects associated with TQM are that doing things right is all about managing things the right way, which needs to be clearly identified and documented in different ways, such as in the form of approaches, methodologies, mechanisms, processes, procedures, flow charts, and process maps. In Zairi and Youssef's (1995) definition, from the first time means that there is a well-established system to ensure the overall activities of the organization are performed right from the word go. Any errors or mistakes are captured and analysed, the causes of errors and the root causes are defined, and corrective and preventive actions taken with proper follow up. Furthermore, every time in the definition means that the people of the organization have the right skills for doing their jobs and are engaged and empowered enough to perform their tasks effectively and efficiently at all times. Lastly, it is critical to analyse the results, utilize the successes, and learn from the failures, perform comparisons and benchmarking, and then start planning again.

TQM should be perceived as a quality in every single component of, and action within the organization, starting from preplanning, planning, execution, monitoring and evaluation, and reporting of the results. This is also the definition of excellence which was built upon the Deming cycle (Plan, Do, Check, Act). The table below, which is adapted from Dahlgaard Park *et al.* (2013), shows the evolution of quality management starting from quality inspection in 1910 to TQM in 1980.

Phase	Features
QI (quality inspection 1910)	Salvage Categorizing Corrective action Identify sources of non – conformance
QC (quality control 1924)	Quality manual Performance data Self – inspection Product testing Planning of quality Statistics using Controlling the paperwork
QA (quality assurance 1950)	Third – party approval Audits of the systems Planning of quality Quality manuals Costs of quality Process control Failure mode and effect analysis Non – production operations
TQM (Total quality management 1980)	Vision focused Continuous improvement Internal customer Measurement of performance Preventive action Company – wide application Inter – divisional/departmental barriers. Leadership & management

Table 1. 2 The evolution of quality management

As a result, TQM is the culmination of decades of evolution from a narrow to wider scope of quality.

1.3 Business excellence

Grunig and Grunig (2008) indicated that when they chose the term “Excellence” during a board meeting of the research foundation in 1984, Peters and Waterman’s (1982) book titled “In search

of Excellence” had already sold more than five million copies in sixteen languages. Peters and Waterman defined excellence after investigating the characteristics of the management in the organizations that they described as being ‘excellent’. The criterion for ‘excellence’ was continuously profitable organizations. They identified eight common characteristics between forty-three excellence organizations and recommended those eight attributes to be followed by the ‘less excellent’ organizations to replicate their success. Organizations that want to excel and achieve continually increasing profits must review the common practices of the most successful organizations. This practice is needed to identify what practices are followed and implemented in successful organizations and then identify strengths that need to be maintained and emphasized. Additionally, the practices that are being implemented in the best organizations and that are not yet followed by the ‘less excellent’ or less successful organizations should be seen as areas for improvements to reach the desired goals where the organization wants to be.

Modern organizations operate in a highly dynamic and volatile environment where excellence is a central issue for organizational survival, both in public and private sectors. For instance, the reason for survival and success of Du Pont, which has been operating for over two hundred years now, is assumed to be business excellence. Unless organizations are able to achieve excellence and project themselves as not only strong product brands, but also, irresistible employer brands, they will fail to remain competitive. Therefore, what is the meaning of excellence?

There are many definitions of excellence and they differ based on where the term is coined and by whom. Oxford Advanced Learner’s dictionary (2020) defines excellence as “*the quality of being outstanding or extremely good*”. Antony and Bhattacharyya (2010, p. 43) define organizational excellence as “*the outstanding measure of the relationship of all performance variables influencing an organization’s role*”. EFQM defines ‘excellent organizations’ as “those

organizations that achieve and sustain outstanding levels of performance that meet or exceed the expectations of all their stakeholders” (Suárez *et al.*, 2017). Essentially, all definitions converge on the fact that excellent organizations clearly identify their stakeholders and have a good understanding of their needs and expectations. They have well-established policies, strategies, projects, and initiatives to meet or exceed their stakeholders’ needs and expectations.

They consistently achieve outstanding results. Furthermore, these organizations can prove that their superior performance is not achieved by chance. They prove this by exhibiting their understanding and effective management of the relationship between the enablers of success and their results, which allows them to sustain positive results in the future.

Therefore, excellence defines a sustainable edge over peers earned through consistently good performance backed by efficient and effective processes and practices. However, it entails much more than just meeting the expectations of their stakeholders and doing what is needed; success is not the only criteria for it. Instead, excellence is far exceeding the expectations of all stakeholders, and sustaining the positive results in both the short-term and the long-term, by clearly identifying the needs and expectations, and taking the proper actions to continuously improve, innovate, and create new techniques for providing products and services that maximize the outcomes including, the most important part, stakeholders’ happiness. In this respect, excellence involves a desire to become above the ordinary and do what you are capable of.

In the words of Mario Andretti, the word champion racing driver, “Desire is the key to motivation, but it is determination and commitment to an unrelenting pursuit of your goal- a commitment to excellence – that will enable you to attain the success you seek” (Andretti, 2015). Even although the abilities and capabilities of an organization are extremely important for reaching a high level of excellence, the desire to reach that level is the most important thing in an organization’s

armoury. It is extremely tough to reach a level of excellence. For government organizations and individuals that make them up, a fighting spirit is critical to reach the top and become number one. Organizations can take inspiration from the words of Warren Bennis, the Chairman of Harvard University: “Excellence is a better teacher than mediocrity. The lessons of the ordinary are everywhere. Truly profound and original insights are to be found only in studying the exemplary” (Bennis, 2014). Public organizations can learn from the success stories of distinguished governments in the UK, USA, Switzerland, Dubai, and Singapore and from the success stories of distinguished organizations such as IBM, BMW, Toyota, DEWA, and Dubai Police who all employ practices and measures that are allowing them to pursue and achieve excellence in their respective fields.

Business excellence is a methodology or philosophy that has progressed from TQM and now covers the following (Unnikrishnan, Tikoria & Agariya, 2019):

- I. It is about adding value for the stakeholders by improving the performance of an organization through the building and solidification of its processes and management systems.
- II. It is about achieving outstanding business results through excellence in every single practice or action an organization does (i.e., leadership, strategy, human resources management, knowledge management, processes management, and customer focus)
- III. It is a validated excellence in performance results related to stakeholders in addition to processes and strategies through a recognized business excellence model-based assessment.
- IV. Business excellence is achieved when the excellence requirements, values, and concepts, are spread among all activities and within an organization’s DNA.

According to Gorenak (2015), business excellence has an essential impact on the organization's success, competitive advantages, and awards winning in the long and short-term.

For Hasan and Hannifah (2013), business excellence is a continuous improvement process that ensures a performance without errors by all of the organization's people at different levels. This level of performance helps to deliver high quality services that meet and exceed the needs and expectations of the organization's customers. Furthermore, business excellence is to manage the organization according to the set values and fundamentals as one of the leading practices (Shrouty & Tiwari, 2017).

From the examination of the definitions illustrated above, we find that business excellence is not a function within an organization. Instead, it is a concept that requires everyone in the organization at different levels to perform their work and accomplish their tasks with the benchmark of 'excellence'. Business excellence is not the responsibility of a particular manager, division, department, office or team; it is the responsibility of all of the organization's people. Buildings, machines, or furniture owned by an organization do not make it competitive. Instead, an organization's competitiveness and excellence depend on its people; they are the most valuable tools possessed by an organization to achieve business excellence. Therefore, the organization's excellence is the sum of its people's excellence.

In this regard, it is important to analyse the relationship and distinguish between three expressions which are business excellence, operational excellence, and process excellence. According to EFQM, business excellence is managing the whole organization with world class practices while operational excellence is following a clearly agreed strategy in the planning of the operations (Shrouty & Tiwari, 2017). On the other hand, process excellence is about effectiveness and efficiency of the organization with minimum changes in the amount or level of spending.

In this research, the focus will be on business excellence as it covers the excellence of the total organization and works as a framework for the operational and process excellence. Table 1.3 below, which is adapted from Shrouty and Tiwari (2017), illustrates the differences between the three phrases:

Business Excellence	Operational Excellence	Process Excellence
The entire organization working towards a common goal of meeting and exceeding the needs and expectations of stakeholders.	The chain of processes (end to end) including human resources in its defined scope.	The level of efficiency and effectiveness of the process.
Business excellence provides the right track to be followed; both operational excellence and process excellence are required.	Focus on the communication between different systems, tools, technologies, humane and other resources including how they are integrating and interacting.	The key objective is to provide outcomes that are positive and consistent with a high level of conformity.

Table 1. 3 Distinction between business, operational, and process excellence

Figure 1.1 below, which is also adapted from Shrouty and Tiwari (2017), illustrates the relationship between business, operational, and Process Excellence further.

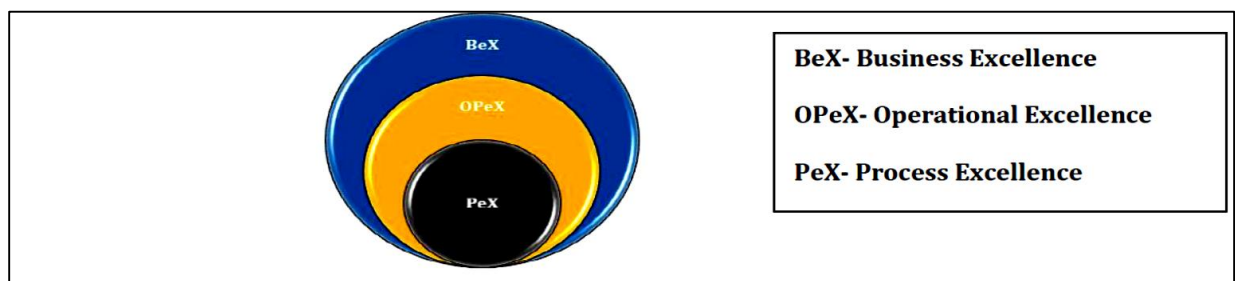


Figure 1. 1 Relationship between business, operational, and process excellence

Looking at the above discussion, business excellence is the understanding, commitment and clear vision of the leadership as “excellence starts at the top”. Strack *et al.* (2009) have identified the right strategies and objectives to achieve the agreed vision. These include managing the human resources effectively towards the agreed objectives and vision, allocating the needed resources, establishing the suitable systems, and identifying and managing the main processes to achieve and sustain the targeted outstanding results that meet and exceed the needs and expectations of the stakeholders. As per the EFQM model, the leaders of organizations that achieve excellence are the ones that shape the future and make it happen (Suárez *et al.*, 2017).

The EFQM model also highlights that ‘excellent’ organizations develop a stakeholder focused strategy through which they implement their vision and mission while their strategy is delivered by developing processes, objectives, plans and policies. Moreover, such organizations value their employees and create a win-win environment where the individual and organizational goals are achieved effectively and efficiently.

Excellent organizations support the effective operations of their processes, strategies, and policies by planning and managing the available internal resources and the relationships with external partner and suppliers besides ensuring the effective management of their impact affecting the environment and society. Furthermore, excellent organizations increase value for their stakeholders by designing, managing, and continuously improving their processes, products, and services. From this discussion, it is apparent that the most important feature of excellent organizations is their ability to achieve and sustain outstanding results that not only meet, but also, far exceed the needs and expectations of their stakeholders.

1.4 Excellence and TQM

As understood through the analysis and review of Dahlgaard-Park *et al.* (2013) who have assessed the studies in the quality movement in the period from 1987 to 2011, it has emerged that the concept of business excellence has evolved from TQM, which is evaluated for quality that starts with investigation. Therefore, it was quality thinking that led to excellence, which links the concepts with each other as is illustrated below in figure 1.2, which is adapted from Hafeez *et al.* (2006):

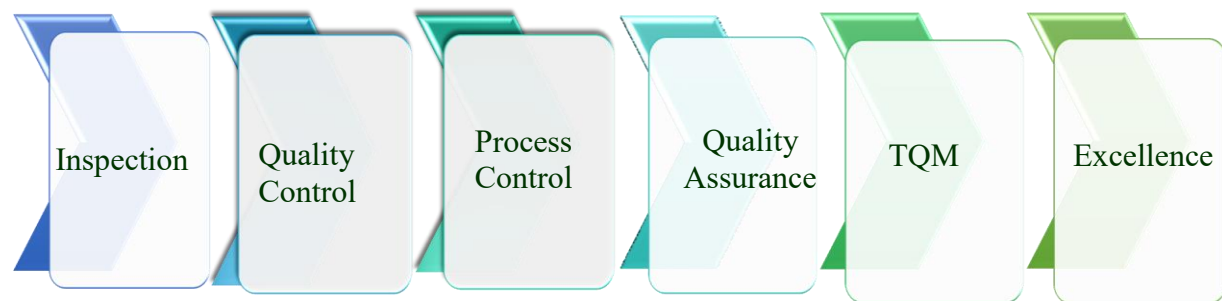


Figure 1. 2 Excellence and its relationship with TQM

Looking at figure 1.2, the process of excellence begins with the inspection for compliance with planned specifications. Any lagging areas are then subjected to quality control plan. After this step, the assurance of quality during execution is possible by measuring pre-planned measures to ensure that the targeted level of quality is achieved at higher levels. TQM helped to ensure that quality at all levels was maintained by promoting the idea of doing the right things right from the first time and every time (Zairi & Youssef, 1995). TQM took centre stage from the late 1980's to the middle of the 1990's. After this, excellence and business excellence overtook the position of TQM in the management literature. However, these new terms are part of the quality framework (Dahlgaard-Park, 2011).

For the purposes of this research, it is critical to understand the evolution of excellence, how it was developed and extracted from the concepts of quality and TQM in order to identify the requirements of implementing excellence clearly whether it is in public organizations or private ones. This process will help in identifying the factors of measuring the excellence implementation outcomes in the later stages of the study.

1.5 Design and Design Thinking

Before understanding what is implied by the term design thinking, it is important to identify the term design. It is defined as the “process of planning, creating, and implementing ideas to improve the artificial environment” with a central concern of ensuring that the new ideas can be conceived and implemented (Cross, 1982, p. 228). This definition shows that design has become an important part of management in most areas by bringing the elements of strategy and organization to fields which traditionally did not rely on such concerns. Similarly, design has also entered into the field of managers who are now asked to focus on creativity, innovation, and disruptive changes that can yield a competitive advantage to their firms. Such changes are now made necessary as organizations are increasingly invested in the use of technology which is evolving at a rapid rate. In a world signified by the fourth industrial revolution, the incremental changes needed in all work spheres are putting the pressure on organizations to think like designers while working like managers. The early adopters of technology have made the gains for the first movers in business even more, making it imperative that organizations invest in design.

In such conditions where design and management both learn from each other, the question of how to encourage creativity and design thinking in organizations has assumed mounting importance. Leaders are bringing awareness in their employees, sending them for training workshops, hiring design students, and creating cross-functional teams to bring in a variety of ideas, fresh thinking,

and out of the box reflection. However, even these interventions are found to not be sufficient (Boland & Collopy, 2004). An integral factor which is missing in these interventions is of merging design into the strategy of the organization so that all objectives are met through a creative, user-focused, and innovative mechanism driven manner. Such an implementation is termed design-led strategy and is crucial as products have to match the growing aspirations of the public. In fact, products have to pre-empt and predict the customer demand and preferences. An oft-cited example in this case is of the iPod which was a hitherto unknown gadget which captured the market and ushered in an era of smartphones. Such out of the box thinking in design has to be matched with the market demand and astute marketing skills. Such thinking and products, thus, bring design into management as it ensures that organizations are creating new products that add value and remain relevant. In other words, design in management planning works towards creating products that can act as cash cows.

The intention to create such products, however, faces challenges as there is a gap between the tacit knowledge and the explicit information available within the employees (Brown & Wyatt, 2010). The tacit knowledge among the customers and the market has to be tapped in a manner that managers and designers are able to convert it into products and services. This gap between the tacit and the explicit knowledge can be breached through design as well. This resolution is made possible by the possibility of identifying and processing other types of communication like images, gestures, and materials rather than only words for understanding the market.

The incorporation of design in management began in the 1960's when managers began conducting market research into what products are required in the markets using visual means which went above and beyond the existing information available through surveys and feedback sessions. This development involved the addition of prototypes, observations, sketches, personas, and other

physical data to enrich the understanding of customers and what they want (Beckman & Barry, 2007).

The first few instances of design in management were seen in engineering where engineers used designs to improve their constructions and make them better suited to the surrounding environment. The same form of empathy was later brought to management, which allowed managers to improve their empathy to the surroundings and build products and services which had an intuitive appeal for the market. By offering the options of building prototypes and testing them, design brought novel ways of connecting with the target market where chances of success improved. This improvement was made possible by allowing managers to predict demand, test products for any defects, build better emotional connect, and create a series of options for launch which could offer the best possible means of reaching out to all market segments.

With so many benefits offered by involving design in management, it is no wonder the union found a lot of favour among corporates. Most strategic consultants and managers incorporated design elements in their planning and encouraged organizations to follow suit (Liedtka, 2015). The Boston Consulting Group created a separate wing dedicated to design called the BCG Digital Ventures. McKinsey and Company also followed suit and launched McKinsey Design which incorporates design in their strategic consulting work. They also acquired a design firm called Lunar which had already been supporting big Tech companies like Apple, HP, and SanDisk in their decision making. Bain and Company created a separate wing called Adapt@Bain to support their clients with human-centred design and creation of prototypes which are merged with technology-enabled creation of alternatives through machine learning and algorithms using big data analytics. With consultants supporting organizations with design elements, it was not long before the organizations felt the need to have a more permanent and cost-efficient solution by hiring designers and making

them a part of the product design and testing teams. This trend has continued with most big corporations choosing to keep designers on product development teams for their unique perspective and appreciation for aesthetics and creativity. Design in management and management in design have, therefore, become important companions.

Defined simply, “*Design thinking is a method designers use in ideation and development that also has applications elsewhere*” (Brown & Wyatt, 2010, p. 31). Design thinking methodology focuses on human needs and is, hence, human centred. It consists of five main parts which are Empathize, Define, Ideate, Prototype and Test. The main focus in design thinking is on designing of user experiences (UX) which is very useful in solving unidentified problems (Roberts *et al.*, 2016).

Liedtka (2015) states that significant attention has been generated by design thinking in the news and publications relating to the business world. The author further adds that the concept is celebrated as a novel methodology for solving problems commonly faced by business organizations as it encourages innovation and growth. Despite this ability of design thinking to improve the outcomes of innovation, it has not received the attention it deserves from business scholars (Uebernickel *et al.*, 2020). For example, there is a very limited discussion linking design thinking to the literature on decision-making and individual cognition. This is why investigating design thinking as a practice that has great potential to improve the outcomes of innovation by assisting decision-makers in minimizing their individual-level cognitive biases is needed.

Elsbach and Stigiani (2018) state that, traditionally, the focus of designers has been on enhancing the appearance and function of products. However, there has been a shift in focus as recently many designers have begun using design tools to overcome complex problems. An example of this problem-solving technique is determining ways to provide healthcare at a low cost throughout the

world. This new approach called design thinking was first embraced by businesses with non-profit organizations joining the bandwagon later.

At this point, it is important to discuss the origin of design thinking. The concept of design thinking came about as a result of the efforts of many researchers starting with Richard Buckminster Fuller in the early 1960's who introduced the concept of design science revolution (Von Thienen *et al.*, 2018). This concept emphasized that the human and environmental problems can be solved by the implementation of design function using scientific and rational approach rather than political and economic solutions (Cross, 2018). In the middle of the 1960's, a non-traditional methodology was introduced by Horst Rittel for designing multidimensional and complicated problem-solving named as the "Wicked Problems" (Buchanan, 1992). Herbert Simon was the first to present design as a way of thinking in his book "Sciences of the Artificial" in 1969. The dealing of design as a technique or science of thinking was introduced by Herbert Simon and Robert McKim in the early 1970's (Von Thienen *et al.*, 2018). Nigel Cross published a paper in 1982 in which he added that *"a central feature of design activity, then, is its reliance on generating fairly quickly a satisfactory solution, rather than on any prolonged analysis of the problem"* (Cross, 1982, p. 223). The first introduction of design thinking as we know it today was by Peter Rowe though his focus was on design mechanism in urban planning and architecture (Rowe, 1987). Dorst (2011) reveals that the term design thinking has been part of the design researchers' combined consciousness since 1987, which is the year Rowe used it as part of his book.

Design thinking has increased in popularity over the last few years. Today, it is seen as an exciting new concept for many different sectors including IT, medicine, education, and business. This poses a challenge for the community of design researchers to find answers to two critical questions which are "what is the core of Design Thinking?" and "How does Design Thinking work for the

organizations and practitioners in other fields?” We have witnessed the emergence of several design thinking models that are based on widely different ways of viewing situations related to design and that utilize models and theories from education, psychology, methodology, among other fields related to design (Carlgren, Rauth & Elmquist, 2016a). These research streams come together to generate a thorough and varied understanding of an extremely complex human reality. In recent times design thinking has been viewed as an enthralling new paradigm for taking on the challenges in different professions especially society and business (Muratovski, 2015).

An interest in design can be due to many different reasons. Therefore, different people have a different approach to design thinking. For example, Dorst (2011) addresses a particular aspect of design thinking as focused on that which is expressed by the business and management communities. Similarly, Glen *et al.* (2015) believe that it is the business organizations and their communities that have an urgent need to expand the portfolio of strategies that look to address the complex and open-challenges faced by contemporary organizations.

Since designers have been dealing with complex and open-ended problems for a long time, it could be interesting for these organizations to study how designers work and adopt some design-related practices. Additionally, elaborate professional practices have been developed by designing disciplines to do this. A particular interest in how designers create ‘frames’ is created by the challenge of dealing with the complex and open-ended problems faced by design teams, in addition to how organizations deal with frames in their own field of practice.

The eagerness to adopt and apply these design practices in other fields has created a sudden demand for clear and definite knowledge about design thinking including a definition and a toolbox. This urgency is quite problematic for a design research community that has been shy of oversimplifying its object of study and cherishes multiple perspectives and rich pictures.

After significant effort by designers, academics, and thinkers have simplified the design thinking concept and made it easier to be understood, adopted, and utilized in different disciplines of business by spreading it from an internal solution in the organizations, to a modern, scientific and systematic approach. Such an approach can be used by both designers and non-designers for better understanding of the problems, analysis of their causes and developing effective solutions to address them (Mosely, Wright & Wrigley, 2018).

Kimbell (2011) finds that a lot of attention has been given to design thinking in various contexts over the past decades that go beyond the traditional practices of designers. The main thinking is that the problem-solving methodologies of designers add value to organizations that are looking to innovate, as well as, to societies that are trying to make the change happen. In her paper, Kimbell (2011) reviews the origins of the term of design thinking in research that relates to designers and its adoption by consultancies and management educators that exist within a global economy that is both dynamic and mediatized. The author identifies three main accounts, design thinking as a cognitive style, as a general theory of design, and as a resource for organizations.

Efforts have been ongoing to describe specific things, performed by design professionals, and what makes them different (Birdi, Leach & Magadley, 2016). According to the researchers, a lot of attention was given to design methods in the 1960's and 1970's which paved the way for a generalized design thinking in the following two decades.

More recently, in an attempt to innovate their disciplines, management educators and scholars have started to pay attention to design. The innovation is sought in matters such as organization design (Leih, Linden & Teece, 2015), strategy (Porter *et al.*, 2016), and research design (Wrigley & Straker, 2017). One of the insights that have emerged is that it is important for managers and others to either start thinking in the same ways as designers (Carlgren, Rauth & Elmquist, 2016a) or adopt

a design attitude (Wrigley & Straker, 2017). Furthermore, it is important for organizations to organize themselves like design teams (Dunne & Martin, 2006).

The promotion of design and design thinking is already keeping some governments busy. For example, the Design Council, a national body funded by the UK government, makes the argument that a key role in innovation is played by design thinking (Design Council, 2011). Design, more specifically, design thinking, has the power in these accounts to encourage innovation and change not just in organizations, but also, societies. While everyone might be a designer in popular culture, it seems that everyone in management needs to be a design thinker.

However, the term ‘design thinking’ can confuse some people. Contributors to the magazine, consultancy, and practitioner blogs debate over the exact meaning of design thinking and whether there is more value in other terms, such as innovation, invention, and creativity (Hobcraft, 2018; Naude, 2018; Stevens, 2019). The contributors look to determine whether there is a difference between design thinking and other kinds of professional approaches towards work and the creation of value, such as systems thinking (Patel & Mehta, 2017). However, the difference between both terms persists as design thinking proceeds on a bottom-up approach with a human-centred view to find innovative solutions while systems thinking is more top-bottom and focused on bringing change. It is important to mention the work of Kerzner (2017) here who has provided a 16-point methodology to take a project to maturity while building upon the tenets of system thinking. Among these tenets, involvement of everyone important to the project is akin to the human-centred approach of design thinking.

The discussion of the above-mentioned contributors shows a lack of uniformity in the literature related to design thinking research, as well as, in organization and management studies regarding how designers perform and think about things, how unique they are, and how it all relates to

organizations, creation of value, and knowledge production.

No matter how confusing it may seem, the concept of design thinking is gaining widespread recognition and appreciation beyond the design professions, and therefore, it becomes critical to revisit its principles. Design thinking is a solution-based approach to detect what users truly want, which is crucial in user experience design. Having a lot of creative strategies, experts in disciplines outside what we usually regard design—e.g., education and business—have likewise are now implementing design thinking (Porter *et al.*, 2016). Design thinking's tools and techniques gain from a mixture of practices that encompass ethnography, computer science, psychology, and organizational learning. In-order to deal with ill-defined or poorly defined problems which are termed wicked problems, design teams need design thinking because it re-shapes these types of problems in human-centric approaches, supporting the designer to concentrate on what is most critical for her users (Buchanan, 1992). Organizations such as Apple and Airbnb have used it to notable effect.

Design thinking is essentially human-centred. It starts with humans instead of starting with technologies and economics. Design starts with human need or what may become need in the future, what makes their life easier and enjoyable, and what makes technology useful and usable. It is about understanding culture and context, starting with people and not with technology as the human need is the place to start. Design thinking moves to learning by making instead of thinking what to build or building in order to think.

Design thinking, as an approach, looks into the capacities that we all possess but are ignored by the traditional practices for solving problems. Not only is the focus of design thinking on the creation of human-centred products and services, but the process itself is also extremely human. Our intuitive abilities, as well as our ability to identify patterns and generate ideas that are

functional and have emotional meaning serve as the basis for design thinking. This thinking allows us to use more than symbols or words to express ourselves in media.

While running an organization based only on inspiration and intuition is not recommended, it can be risky practice to over-rely on analytical and rational thinking. A third option is provided by the integrated approach that sits at the core of design process, which is now a part of design thinking. Instead of a sequence of steps in an order, the design thinking process is a system with spaces that overlap.

When it comes to design thinking, three spaces need to be kept in mind, inspiration, ideation, and implementation (Mosely, Wright & Wrigley, 2018). Inspiration is the opportunity or problem that encourages one to look for solutions, ideation is all about generating, developing, and testing ideas, and finally, implementation is the process that transitions the idea from a prototype into the real-world or the lives of people.

The reason the design thinking process is categorized into spaces and not steps is that it does not always follow a set of steps or pre-established sequence. Often, design projects will go through the inspiration, ideation, and implementation space more than once; this happens because the design team needs to explore new directions and refine its ideas. Therefore, it does not come as a surprise that many people are overwhelmed by the design thinking process when they use it for the first time. However, over time or as a project moves along, people taking part in design thinking start to realize that not only does the project make sense, but it also helps to achieve results. This realization is despite the fact that the form of design thinking is different from the linear processes based on milestones that organizations usually undertake.

Prototypes speed up the design thinking process; as we start to prototype, we start to understand the weaknesses and the strengths of the process. It is the vehicle of progress. As the tenets of design

thinking principles are implemented from consumption to participation, there is a shift from passive relationship between the consumer and the producer to the potential of participation and active engagement of everyone.

1.6 Design thinking process

As discussed above, design thinking has the potential to merge improved decision-making with design elements and contribute to a more efficient and effective strategic thinking. However, when the actual time of implementing design in work decisions comes, a number of challenges are thrown open. These challenges range from difficulties in imagining how the design should be, what impact it can have on existing processes and operations, and how it will affect the product market. Design interventions can help overcome these challenges and allow organizations to bring design in their planning and implementing. This ease is brought in when managers are allowed to see how design interventions can be visualized and applied in small, manageable projects rather than an abstract idea. When such small, manageable projects begin adding value to the existing operations and making the ultimate products and services more attractive for customers, the value of design thinking for all stakeholders is improved (Uebernicket *et al.*, 2020).

The first challenge for design thinking in organizations is in building an interest in design thinking, which is made possible through a cycle of events described by (Beckman & Barry, 2007). The first step in this cycle is building awareness among stakeholders by educating them about design, its benefits, and how it can be relevant to their work. This education should include an urgency about the need for innovation and how it can help managers to create better value for their customers and higher sales for their organizations. The next step is about gaining the stakeholders' interest which is made possible by demonstrating to them how design thinking can yield value for their work, teams, and organizations. The third step involves generating desire within the stakeholders for

implementing design thinking at work. By teaching them the tenets of design thinking and allowing them opportunities to apply it to work, see its results, and get rewarded for generated value, leaders can invoke desire to implement design thinking. The last step is for encouraging actions. These actions are concrete steps taken to make design a natural and default part of decision making in the organization, which is consistently used for bringing in innovation and creativity. These steps range from the tangible to the intangible and from extrinsic to the intrinsic as managers move through the steps of awareness, interest, desire, and actions. Building awareness among stakeholders is an extrinsic and tangible step as it can be observed and makes a visible and measurable change in their knowledge. Gaining their interest is intangible though extrinsic as it is difficult to measure what extent of their interest has been captured and can be expected to translate to their adoption of design thinking in their work. Invocation of desire is an intangible and intrinsic step as it is also difficult to measure while residing in each individual personally. Lastly, encouraging action is a tangible and intrinsic step which occurs in visible, easily observable form by each individual or team intrinsically, which is depicted in table 1.4 below after adaptation from (Beckman & Barry, 2007).

	Extrinsic	Intrinsic
Tangible	Awareness Build awareness among stakeholders about design and its value for their outcomes	Desire Invoke desire by demonstrating the ease of implementation and evidence for prior gained value.
Intangible	Interest Develop interest in stakeholders about the benefits of design making them eager to gain the promised value.	Action Encourage concrete actions to apply design thinking at work and share knowledge with others.

Table 1. 4 Steps to implement the design thinking.

The process depicted in table 1.4 is iterative as it proceeds to the next steps only after the preceding one has been accomplished. Moreover, several cycles of this process gain further acceptance within the organization and improves its practice among the existing patrons of design thinking. This process also shows how design thinking is also a continuum where organizations can choose and be present at any point ranging from minimal to extensive use of design thinking in managerial decision-making. The organizations which achieve extensive implementation of design thinking can claim to reach design integrated strategic thinking. Such organizations have moved from short-term projects to more long-term perspective of design-implemented working and are in a position to guide others. They are more likely to employ design catalysts who are introduced as those people who are capable of initiating and sustaining design thinking processes in their own right (Von Thienen *et al.*, 2018). Within the organization, the catalyst is the change agent who creates design observations, develops insights through them, crystallize meaning through the insights and communicate them, and use the same for driving the strategy for the organization.

Another way of bypassing challenges in front of design thinking is to secure the support of the stakeholders, specifically, the investors, top management, and key employees, right at the beginning of the process. This support has to remain continuous and consistent so that the design catalysts continue to spearhead required changes and realize value through the implementation (Muratovski, 2015).

Among the key criteria of design thinking that set it apart are five crucial ones which have been identified after a systematic literature review of studies in design thinking published in the last few decades (Baker & Moukhliiss, 2020) . The first criterion is of making sure that the design and the related strategy and practice revolve around the users and their needs. This criterion is also the one that emphasizes the human-centred nature of design thinking, which matches its connection to

business excellence and is described at length later in the chapter. The second step is of problem framing in such a manner that identifies all possible solutions after demarcating the requirements and needs of the people involved in the decision. Such framing of the problem assists managers in better sense making of the issue and of bringing in empathy. The third criterion is of visualizing the solutions so that their causal factors, needed resources, and predicted outcomes and their relation to other decisions can be visualized. The fourth criterion is of experimentation through convergent and divergent ideas so that an exhaustive prototype can be developed which leaves little room for any mistakes. The fifth and last criterion is of creating teams with diversity, which can offer varied perspectives and a rich source of data for making better informed decisions and ensuring that out of the box thinking receives a good probability of happening.

1.7 Design thinking approach

In his book “The Sciences of the Artificial”, Simon (1996) defines design as the knowledge that is within the domain of professions such as medicine, management, and engineering, all of which according to him, are concerned with “what ought to be” and not the sciences that dig into “what it is”. The author sees design as a core human activity and describes it as follows: “Everyone designs who devises courses of action aimed at changing existing situations into preferred ones” (Simon, 1996, p. 12).

As understood by Simon, objects are not part of design. Instead, he talks about an action that is a rational set of procedures that exist for responding to a defined problem. The account of design presented by Simon may seem odious to theorists and practitioners in non-engineering traditions which put emphasis on the involvement of stakeholders in defining and solving problems (Mahmoud-Jouini, Midler & Silberzahn, 2016) or researching a design’s aesthetic dimensions and changes in taste (Homburg, Schwemmle & Kuehn, 2015). However, Simon’s figurative knight

of the formal work of designer provided subsequent scholars with something to draw on. From the 1960's onwards, a stream of research was developed that looked at what designers do and how they think.

Referred at times as the "Design Methods" movement ('The Design Methods Movement From Optimism to Darwinism', 2016), these studies look to understand the procedures and methodologies with which designers, successful designers to be specific, approach their design activity, especially, in situations where they faced increasingly complex design problems. The description of Schön's reflective practice (1992) is focused on the work by practitioners during their "reflection-in-action" as they look to reframe problems, based on judgment. Another example is the work by Rowe (1987), Cross (2018) and Lawson (2006) that described the attempts in research to describe how designers in action thought i.e. their "designerly" ways of knowing or simply design thinking.

Taking from this tradition of design studies, Buchanan's (1992) paper "Wicked Problems in Design Thinking" changed the theory of design from its legacy in industrial production and craft towards a more generalized "design thinking" that was applicable to almost everything, whether it was a tangible object or an intangible system. Buchanan, who drew on Pragmatist philosopher Dewey, viewed design as a liberal art that was unique and well-placed to meet the needs of a technology-based culture where different kinds of things are designed, and where the problems of humans are complex. Buchanan saw problems in design as wicked or indeterminate problems to which the designer brings a unique way of looking at problems and finding solutions (Glen *et al.*, 2015). The contribution of Buchanan was changing the design-thinking concept away from a cognitive-approach and towards an intellectual approach to framing and solving problems that acknowledged a design work's social aspects.

In recent years, design theories have shifted even further away from individual cognition and towards an understanding of design that views it as a distributed social accomplishment while acknowledging work in sociology and anthropology, such as by Hutchins (1995) and Suchman (1987).

For Manzini (2015), designers and their design process can be viewed as a culture. The author further argues that the use of social and cultural analysis tools allows scholars to consider not only what designers do and how they organize their work, but also, its effects. Manzini (2015) also points out the neglect of consumption theories in design theory and instead proposes a more mobile design culture as a study field where practice, circulation, and values meet. Shove (2007) calls for a “Practice Oriented Product Design” by combining consumption theory with science and technology studies and making the argument that innovation in products often requires innovation in practice.

Drawing on their experience Boland and Collopy (2004) distinguish between a “decision attitude” and what they refer to as a “design attitude.” They find the former as the foundation of management practice and education where the challenge for managers is to choose between the two different options. The authors conclude that while the design attitude is aimed towards solving problems assumes that it is difficult to design a good alternative, the decision about which alternative to choose becomes insignificant once you have developed a truly great solution (Arroyo *et al.*, 2018). For Boland and Collopy (2004), the analytical techniques and decision attitude of managers are valuable in circumstances where problems are steady while a design attitude is critical when feasible alternatives are not known. Both are needed since managers are not just designers, but also, decision-makers.

It is also argued by Dunne and Martin (2006) that something valuable is offered by design thinking

to managers who can complement the existing analytical techniques. According to Dunne and Martin (2006), design thinking is a combination of inductive and deductive, as well as, abductive reasoning. He makes the argument that managers are not well-served by contemporary management education as it completely ignores the latter. Emphasizing the different ways in which managers make a judgment about validity and reliability, the authors highlight some basic challenges facing those who would adopt “designerly” approaches, or design thinking in management.

Often accounts of design thinking depend on “how designers do things”. An example of this is how Boland and Collopy (2004) describe their experience of working with the architect Frank Gehry when designing a new building for their business school. In their story, they reveal how after working with them for two days on revisiting the space’s arrangement, Matt Fineout, the project architect, tears up the plans which were just agreed on and suggests starting again. This gives them the confidence that they can now solve the problem (Boland & Collopy, 2004, p. 5). Even in this short description, the authors draw out attention to practice. While a design ‘attitude’ is identified by them, it is also possible to take note of the personified, shared experience of working around a table on onionskin sheets, making marks, and framing (iteratively), as well as solving problems using the architects’ routines. From this account narrated by Boland and Collopy (2004), one gets the feeling of the intuitive response of the authors to witnessing the work that they just completed together and the problem-solution that emerges after the already agreed upon solution is tore by the architect. This symbolic story may serve well to communicate a professional architectural designer’s attitude. However, and more importantly, it can also be read as an account of design practice in which designers are willing to generate new alternatives, even when an apparently viable one has been found. This is the foundation of a design thinking approach which

is depicted in figure 1.3 below after adaptation from (Gorgol & Ruciński, 2008).

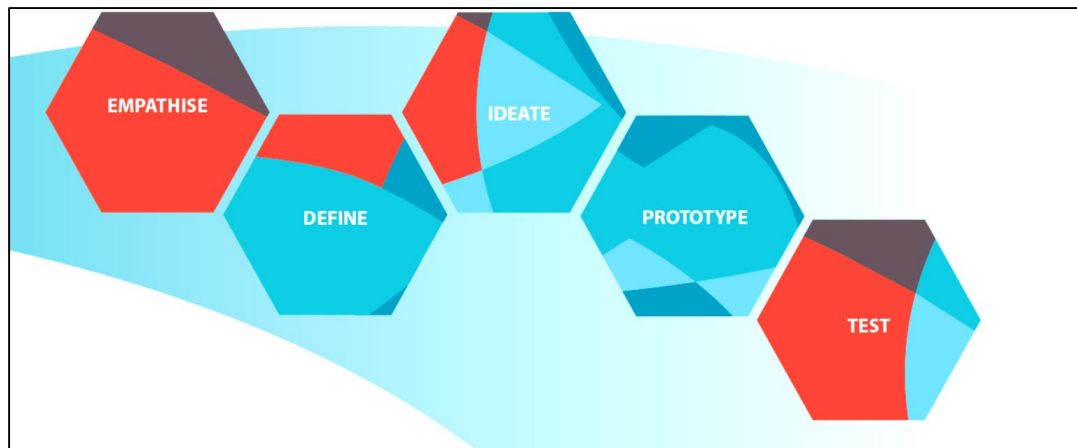


Figure 1. 3 The design thinking approach

According to Gorgol, and Ruciński (2008), design thinking approach contains five steps which are:

a. Empathize

The empathic understanding of the problem is the first step of the design thinking. This step is about investigating the real needs of the user while avoiding any presumptions to dig deep into the problem without any barriers. The aim is to understand the existing situation in order to design the right and effective resolution.

b. Define

In this step, the designer needs to integrate all the collected information from the last step by examining given comments, observations, and data to identify the root cause of the problems under investigation by the designer and the team. In this step, all the angles and characteristics of the problem are well defined.

c. Ideate

After understanding the factors and root causes of the problem under investigation, the designer is

now ready to start generating alternatives for solving the problem. The information from the last two steps will help the designer to innovate new ideas and ways for tackling the defined problem.

d. Prototype

This step contains the examination of the advantages and disadvantages of each solution generated in the last step by the team so that the designer can decide the most suitable solution that has the maximum advantages and the least disadvantages.

e. Test

In this step, the designer tests the effectiveness of the chosen solution from the last step which represents the final product or solution. The implementation of the new solution normally leads to identification of other problems and starting the five steps again.

In design thinking, driving designs into reality is a journey in which many new things will be learned. It is this property of the construct which makes it well suited to implement business excellence in public sector organizations.

1.8 Research problem

While there is a lot of literature available about adopting TQM and business excellence models in the private sector, very little research has been done to provide guidance for implementing business excellence models in the public sector (Motwani & Kumar, 1997; George, Cooper & Douglas, 2003; Tari, 2006; Tickle, Mann & Adebajo, 2016). Most of the earlier research focused on how the implementation of the business excellence model impacted the organizational performance. This investigation was performed using tools for internal and external assessment. While the existing research has identified the factors that need to be considered during implementation, there is still a gap in explaining how to amend the guidelines to fit different organizational contexts. Moreover, more evidence is needed to understand how moderating variables can be amended to improve the link between business excellence framework and its impact on business outcomes.

Such evidence is all the more important as public sector and government organizations are considered inefficient and wasteful with very few believed to have achieved outstanding results in excellence (Thawani, 2015).

Therefore, there is a gap in the existing scholarly and practitioner literature for the investigation of the main factors which affect the implementation of the business excellence model in the public sector which makes the case for conducting more research on the topic. For example, Al Ghufli (2012) who investigated the implementation of business excellence model in a public sector organization of the UAE to identify the variables affecting the success of the business excellence model's implementation plan conducted a survey of the concerned people about their feedback of the model and identified eighteen such variables. However, the information about how this model was implemented to achieve effective outcomes was not explored.

Another study by Twaissi (2008) evaluated the implementation of TQM within the information and communications technology (ICT) sector in Jordan. In this study, the researcher identified twelve factors for proper implementation of TQM. However, this study focused solely on the ICT private companies in Jordan. A third study by Davies (2008) investigated the implementation of European Foundation for Quality Management excellence model and its related issues in some universities in the UK. This study examined five factors segmented as integration factors. One more study by Bauer *et al.* (2005) examined four factors of leadership, strategy, structure, and technology that influence the business excellence model implementation plan with their recommendations suggesting these four factors to be not enough for effective implementation. In a nutshell, all these researchers make an argument for further research and investigation into the implementation of business excellence models.

Aladwan and Forrester (2016) investigated the obstacles in the implementation of one out of the four criteria identified to be important for the business excellence model by Davies (2008) and Bauer *et al.* (2005). Their investigation took the public sector of Jordan as the location of the study to assess the impact of the leadership criterion on business excellence framework. The results showed that criteria like poor strategic planning, lack of employee empowerment, and weaknesses in performance benchmarking affect the implementation of the business excellence framework. Furthermore, Al-Telbani and Radwan (2013) have indicated that the challenges facing the adoption of TQM in the public sector are mainly the lack of commitment of the top management, untrained human resources, a weak management information systems (MIS) and the lack of a culture focusing on excellence. In the context of the Arab region, Ahrens (2013) concluded that there are several challenges facing the Dubai government's excellence program such as existing traditions and social norms, centralization of authority, and the routine nature of work of the public sector. However, this study too shares no indications of how to implement the excellence requirements. Al Awadhi (2010) has provided four reasons why Dubai public organizations fail to win awards in the UAE; low levels of employee happiness, the mandatory participation in the awards, a lack of understanding about the requirements to win the awards among the leaders and a weak quality and excellence culture. However, he too has not provided any details about how to fulfil the requirements for winning the excellence awards.

Dawabsheh *et al.* (2019) have indicated that most researchers in the field of excellence argue that the gap between business excellence and sustainability is filled by innovation. Moreover, the researchers also mention that several studies indicates that business excellence is not an element of business performance. Furthermore, only a few publications have been found related mainly to organizational excellence and its relationship with the performance of the organization although

this relationship is not clearly defined (Antony & Bhattacharyya, 2010). In addition to this, many studies have pointed out that not all of the business excellence models achieve their objectives and fulfil their mandated requirements (Ling & Yuen, 2014; Budi & Mulyana, 2017; Callaway, 2017; Khan & Ali, 2017).

Design thinking is proposed as the framework which can help public sector organizations implement the business excellence framework and reap its benefits for the organizational outcomes more efficiently. Design thinking is defined as an iterative process which challenges existing ways of working to solve emerging problems and reorient the organization (Johansson-Sköldberg, Woodilla & Çetinkaya, 2013). In order to do so, design thinking engulfs the existing knowledge, attitude, and actions of the managers through five phases of empathizing with the users, defining their needs, ideating to challenge existing assumptions, creating prototypes of the solution and testing them (Easterday, Lewis & Gerber, 2014). At present, design thinking has not been applied to facilitate the implementation of the business excellence framework, showing an opportunity for this research which will explore the knowledge, attitude, and actions of the public sector managers to understand how well they employ it for improving the business excellence framework in their respective organizations.

Consequently, it is evident that a research gap persists in the practical understanding of business excellence which prevent managers of the public sector organizations from realizing what measures, practices, and interventions they can adopt to gain the maximum advantage for their organizational performance. This gap extends to a lack of clarity on the kind of attitude and knowledge that must exist among the leadership and the availability of a guiding framework which can facilitate the shift to the business excellence model within the public sector. Accordingly, this study aims to bridge this gap taking the area of the Arab region in focus. It looks to identify the

variables which affect the implementation of the business excellence framework and its influence on the organizational outcomes. Ultimately, the current study attempts to provide a guidance framework for excellence implementation in the public sector.

1.9 Research Aim, Objectives and Questions

The main aim of this study is to investigate the influence of certain facilitators like the knowledge, attitude, and action of the leadership about the business excellence framework with the moderators of design thinking determinants on the implementation of business excellence and its outcomes in the public sector. The planned outcome of this work is to provide a design thinking-based framework which can lead to more effective business excellence influenced outcomes in the public sector organizations. For this purpose, design thinking and its determinants provide a guiding framework that can help leaders positively impact the attitude, knowledge, and actions of their employees and hence, gain better success with business excellence implementation outcomes.

In order to achieve the aim of this study, seven objectives were developed:

- 1- To identify whether a relationship exists between the attitude of the employees in the public sector towards business excellence implementation and the excellence implementation outcomes.
- 2- To identify if the relationship between the attitude of the employees in the public sector and the excellence implementation outcomes is moderated by design thinking and its determinants.
- 3- To identify if there is a relationship between the knowledge of the employees in the public sector about business excellence implementation and the excellence implementation outcomes.

- 4- To identify if the relationship between the knowledge of the employees in the public sector about business excellence implementation requirements and the excellence implementation outcomes is moderated by design thinking and its determinants.
- 5- To identify if there is a relationship between the actions taken to fulfil the requirements of business excellence implementation in the public sector and the excellence implementation outcomes.
- 6- To identify if the relationship between the actions taken to fulfil the requirements of business excellence implementation in the public sector and the excellence implementation outcomes is moderated by design thinking and its determinants.
- 7- To provide a design- thinking based framework for effective business excellence outcomes in the public sector.

In order to meet this research purpose, the following research questions are crafted so that all aspects of the research aim are explored.

- 1- How does attitude influence the business excellence outcomes in the public sector?
- 2- How does design thinking and its determinants affect the relationship between attitude and business excellence outcomes in the public sector?
- 3- How does knowledge influence the business excellence outcomes in the public sector?
- 4- How does design thinking, and its determinants affect the relationship between knowledge and business excellence outcomes in the public sector?
- 5- How do actions influence the business excellence outcomes in the public sector?
- 6- How does design thinking and its determinants affect the relationship between actions and business excellence outcomes in the public sector?

- 7- How does excellence (attitude, knowledge, and action) influence the business excellence outcomes in the public sector?
- 8- How does design thinking and its determinants affect the relationship between excellence and business excellence outcomes in the public sector?

1.10 Research Significance

The primary objective of this research is to encourage a greater focus on how business excellence models are implemented in the public sector organizations. Many researchers have indicated that the vast majority of the studies that investigated the implementation of TQM and business excellence models have focused on the private sector (Motwani & Kumar, 1997; Tari, 2006). Their contentions show that there is a need for further research into the implementation of the business excellence models in the public sector. As a result, this study aims to add value for the academic and empirical fields in the area of excellence implementation in the public sector while providing a base for investigation in other sectors as well.

Furthermore, this research focuses on the requirements of the UAE 4th Generation Government Excellence System announced in 2015. A review of literature has indicated a shortage of studies in this ecosystem. One of the important contributions of this study, therefore, will be to provide valuable recommendations to the local and federal organizations within the UAE, which will enable them to fulfil the requirements of the implementation while also enhancing the internationalization of this model.

The literature review in this research context has indicated that a successful implementation of the business excellence model is affected by certain factors which can facilitate, as well as, act as barriers in its path (Thiagaragan, Zairi & Dale, 2001). Moreover, some of the research conducted for the implementation of business excellence models in the MENA region indicates that many

problems and obstacles are prevalent in this field (Al-Khalifa & Aspinwall, 2000; Al-Zamany, Hoddell & Savage, 2002; Baidoun & Zairi, 2003; Al-Marri, Ahmed & Zairi, 2007; Zairi & Alsughayir, 2011). All these studies have highlighted the importance of having a guidance framework for proper implementation of the business excellence models in the Arab region countries, particularly in the UAE (Smadi & Al-Khawaldeh, 2006; Ling & Yuen, 2014; Budi & Mulyana, 2017; Callaway, 2017; Khan & Ali, 2017). For this purpose, this study aims to explore the applicability of a design-thinking based framework for applying business excellence implementation in the public sector. To the best of the researcher's knowledge, this is the first time such an approach is to be recommended for business excellence implementation in the UAE's public sector. This thesis focuses on using design thinking process determinants to positively influence the attitude of the implementers towards business excellence, expand the existing base of knowledge on its implementation, and increase the ability to take the right action at different levels to improve its effectiveness.

1.11 Study layout

This study consists of six chapters as illustrated below:

Chapter one: Introduction

An introduction for the study is provided in chapter one which also includes an overview of the research problem, its aim, research gap, the significance and need for the study, and the study layout.

Chapter two: Literature Review

This chapter explains existing knowledge of business excellence in the public sector. The chapter also highlights how business excellence models have developed from a theoretical idea to become

a quality related model for organizations. Good understanding of the background of the context behind business excellence models makes the implementation of these models easier. The chapter further delves into design thinking to see how studies have linked it to the construct of business excellence.

Another objective of this chapter is to describe the conceptual framework of the research and develop measurable hypotheses regarding business excellence implementation outcomes. Based on the literature review in the previous chapters, the conceptual framework has been developed to describe the existing knowledge and context of this study.

Chapter three: Research Methodology

In this chapter, the author identifies the research methods adopted to investigate the influence of design thinking determinants on business excellence outcomes in public sector to achieve the research objectives. The study will use the quantitative research method to examine the relationship between the dependent (business excellence outcomes) and independent (attitude, Knowledge, Action and Excellence) variables. The chapter focuses on the effects of the moderated variable (design thinking) on excellence implementation outcomes by questioning the factors affecting the magnitude and treatment effect.

Chapter four: Data Analysis

This chapter includes the analysis of the collected data through the research questionnaire to achieve the research objectives. The chapter includes the findings related to the judgement of acceptance or rejection of the research hypotheses related to research objectives, the relationships between the dependent and independent variables and whether the relationships are moderated by the design thinking and design thinking determinants.

Chapter five: Discussion

The aim of this chapter is to discuss and explain the analysed data presented in the last chapter within context of the study. Moreover, this chapter presents the interpretation of the quantitative results that were provided the previous chapter by comparing them to other studies findings in the same field to answer the research questions.

Chapter six: Conclusion and Recommendations

In this chapter, a summarisation of conclusion is made to ensure that all the research objectives are achieved. As a main aim of the research, a design thinking- based framework for effective business excellence outcomes in the public sector is developed and presented in this chapter. Additionally, the contribution of the research for the academic field and the public sector is presented.

2. Chapter Two: Literature Review

The first chapter introduced the key concepts of this research including business excellence, design thinking, and the factors that affect their implementation. It also introduced the readers to the background of the study showing the gaps in existing knowledge, the need for the study, its aims, and the layout of the study.

This chapter further extends the concepts introduced in the first by detailing the existing knowledge about them in scholarly literature. It focuses particularly on the available studies on business excellence in the public sector and the current models that explain the concept. It also discusses some existing implementation of business excellence in the public sector to understand the context of the construct. It further delves into design thinking and its association with business excellence to create a better understanding about the research model.

The public sector includes entities owned by the government. This sector faces several challenges due to uncertainty in the internal and external environment of the public organizations and the dramatically increasing pressure contributed by the increasing demand and expectations of the public (Qaisar & Khan, 2010; Brusca *et al.*, 2016; Leskaj, 2017). These ever-increasing challenges further expand the need for the business excellence models to tackle them.

Unlike the private sector, the public sector in the socialist economies operate as monopolies with little to no competition. Furthermore, the organizations that make up the public sector face little scrutiny from the regulatory bodies while performing their duties as they are managed under ministries governed by the central government. Due to this reason, public sector organizations often do not need to challenge themselves as much as the private sector which has to rely on its resources and decision-making to survive (Bartel & Harrison, 2005). The protectionist and paternalistic policies of the government imply that the customers and beneficiaries of these

organizations are left with no choice but to come to them. As a result, several inefficiencies remain unaddressed in the public sector which would have been identified or led to the demise of a private organization.

With growing public and media scrutiny, managers are looking for ways to make the public sector organizations become better managed. This is possible through positive competition by the adoption and implementation of high-level performance criteria in order to encourage a dramatic positive change in the performance, results, and services of the government organizations which can help them become world class. Such large-scale change can be achieved through the provision of a guidance model for business excellence which indicates continuous areas of improvements, initiatives, and development activities (Kanji, 2008). As a result, excellence is fast gaining recognition as a serious public sector concern worldwide. This trend is indicated by Talwar (2011) who reported that there are about one hundred national excellence awards used by eighty-two countries all over the world that follow several models of business excellence. A good understanding of the background of the context behind business excellence models makes the implementation of those models easier.

Design thinking has brought the elements of designing and aspiring for excellence rather than consensus to the field of management (Carlgren, Rauth & Elmquist, 2016a). With its focus on people, small changes, ideation, and consistent efforts to improve results, design thinking has an intuitive appeal as the guiding framework to implement and facilitate business excellence.

2.1. Business excellence in the public sector

As illustrated in chapter one, most of the existing literature on adopting business excellence and TQM models investigates the private sector rather than the public sector. However, a lot of literature has covered the adoption of TQM and business excellence in the private sector (Motwani

& Kumar, 1997; George, Cooper & Douglas, 2003; Tari, 2006). Insights from such studies can be beneficial for the public sector by indicating pitfalls to avoid and positive actions to be taken. According to Thawani (2015) who studied the application of business excellence in the public services, governments like the UAE, the US, Singapore, the UK, and Canada have established huge development projects to improve performance, especially in the public sector, by implementing different policies such as investment in technology, diversification of the channels of service, delivery and the implementation of excellence frameworks like Malcolm Baldrige and EFQM models. However, there are few governments that have managed to achieve outstanding results in excellence.

One year before the twentieth anniversary of the Slovenia Prize for Business Excellence, Gordana Žurga (2017) highlighted the value added by the excellent organizations to the country's economic competitiveness. The government of Slovenia supports the business excellence prize and launched a business excellence strategy (2018-2030) to maximize the outcomes of adopting business excellence in the public sector. In their book, "business excellence models and awards for the public sector", Mann *et al.* (2014) have highlighted the importance of the business excellence models for tackling public sector challenges. The objective of this book is to serve as a guide for national organizations that are trying to launch a business excellence model or award for the public sector. The authors have focused on encouraging business excellence and support in organizations to increase the adoption of business excellence models. The last section of this book provides examples of implementing business excellence models in the public sector including a national productive organization in Fiji, the Philippines and Sri Lanka. By citing three examples of awarded public organizations for their business excellence practices, the authors have answered the question of whether public sector firms can implement it effectively.

The public sector faces a lot of challenges. Mark Robinson (2015) has indicated that public management is the result of the transformation from the traditional public administration. As a result, any efforts for public sector development need to use a public management model that suit the context of the organization it is implemented in. Public sector organizations need to always keep the needs and expectations of the public in mind during the development efforts. This priority may require them to sometimes sacrifice on efficiency in favour of effectiveness.

The challenges faced by government organizations were summarized by Mann *et al.* (2020) as follows:

- 1- Become customer focused and accountable to customers: The term ‘citizens’ has changed for consumers of the government services these days. The expectations of the public service recipients are critical to the level of their happiness, and thus, the services need to be user-centric.
- 2- The governments need to stay up-to-date and utilize the latest technologies that facilitate the convenience of the services for the recipients and make their delivery easier.
- 3- The governments today need to be smart. A smart government means “the use of innovative policies, business models, and technologies” to address the financial, environmental, and service challenges facing public sector organizations (p.35). The concept of Smart Government relies on consolidated information systems and communication networks” (Dolicanin *et al.*, 2015). The ultimate goal of a smart government is to reduce the unnecessary steps or procedures of delivering services, helping save time, cost, and efforts for both the provider and receiver of those services while maximizing the customers’ happiness by exceeding their expectations.

- 4- To appear as one service provider by establishing proper connections between the concerned governmental entities. All public entities within a government are responsible for the achievement of overall governmental objectives as per their area of activity. As a result, they are all on the same side when it comes to providing for the customer needs and expectations. Working as isolated islands is no more acceptable with the recent revolution in digital and communication technology. Many initiatives have been launched recently to link the government branches to each other to provide services, starting from one-stop-shop to the most recent block chain technology.
- 5- Public private partnership; modern governments can work with a partner from the private sector in order to utilize their external experiences while also providing for more cost-effective delivery of the services.

The public sector faces different challenges from the private sector but the fourth industrial revolution has removed these barriers and is forcing all organizations to participate in the rapid technological advances to deliver a customer delight experience (World Economic Forum, 2015). Unless the public sector is able to adapt and adopt the required changes in its functioning, it will fail to deliver the required measure of performance.

In the current century, excellence is increasingly recognized as a serious, worldwide public sector concern. About eighty-three countries all over the world are implementing a program of business excellence award (Mann, Mohammad & Agustin, 2010). Furthermore, there are about one hundred national excellence awards all over the world that follow several models of business excellence and force their implementation in governmental organizations (Talwar, 2011; Wen *et al.*, 2016) . In these cases, business excellence is considered as a solution for tackling the public sector challenges by following the world's most successful organizations' practices. Those best practices

were collected in each area. For example, what are the common practices of leaders in the most successful organizations? What leadership criteria facilitate their success? What are the common practices that are followed by the most successful organizations to prepare, implement and follow up their strategies? The answers to these questions were collected and classified as strategy. For any organization which needs to improve its outcomes, the managers need to compare their real practices with the ideal practices included in the model. The comparison will indicate the best practices representing the strong points they need to keep and emphasize and also the areas for improvement that need to be converted and implemented. This is in line with business performance improvements resources indicated by BPIR (2019) who suggest using business excellence models to categorize and present business improvement information as the real outcomes of the business excellence implementation. To illustrate this concept more, the next section discusses some examples of business excellence models.

2.2. Business excellence models

Rapid changes in the industrial environment and the complexity resulting from the increased dependency relationship between organizations, communities, nations, and their economies have made it necessary for organizations to maintain their capabilities to compete. For instance, the ongoing US-China trade war is putting pressure on Australia to choose sides between its long-time political ally and largest supplier of imports. It is not only the external environment changes, but also, developments in the internal environment, like the need to remain on the edge of technological evolution, which are forcing organizations to think out of the box and come out with innovative tools and techniques for capturing and directing their stakeholders' needs and expectations in an effective manner. In such a context, the business excellence models are seen as

frameworks for understanding and managing the above complexities (George, Cooper & Douglas, 2003).

As mentioned above, in order to reach a high level of quality and competitive capabilities at the government and organizational level, many countries of the world have established business excellence or quality awards (Marwa & Zairi, 2008; Hasan & Hannifah, 2013; Shrouty & Tiwari, 2017). These awards at the national level represent the commitment of the countries' leadership towards adopting and implementing business excellence model requirements. Most of these awards follow either the European Foundation of Quality Management (EFQM) model or the Malcolm Baldrige model (Mann, Mohammad & Agustin, 2010). While the first business excellence model to emerge was the Deming Excellence model, it is the EFQM and Malcolm Baldrige models which have found more widespread acceptance and implementation (McDonald, Zairi & Idris, 2002; Doulatabadi & Yusof, 2018; Lasrado, 2018). As announced by Dr Zeyad El Kahlout, the representative of the Dubai Government in its excellence program at the Global Organizational Excellence Congress, Abu Dhabi in 2018, the UAE's fourth generation excellence model is the first purely governmental excellence program in the world because all other models were established for the private sector first (Alhafiti *et al.*, 2019). The following section introduces all the business excellence models to help understand the context of this research.

2.3. Deming Prize (DP)

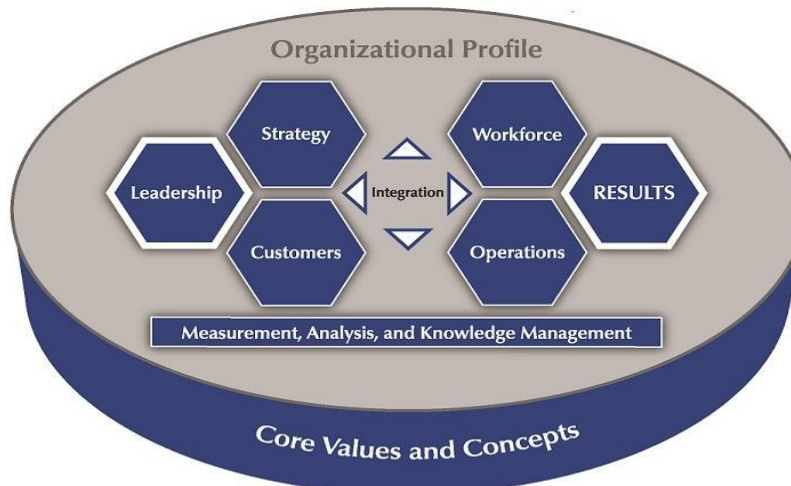
Following the success of the implementation of Deming's ideas in quality management for recovering after the devastating effects of the World War II in Japan, the Union of Japanese Scientists and Engineers (JUSE) established an award named after Deming to appreciate him as the father of quality management (Stading & Vokurka, 2003). Another purpose of establishing this award was to distinguish between the total quality control performance improvement from a

statistical process control approach. The Deming prize honours both public and private organizations in certain criteria that include their success in implementing the QC activities (Mirzaee *et al.*, 2019). Since the establishment of the Deming Prize as an award with the highest prestige, the significance of improving the manufacturing quality in Japan increased, its criteria became more tangible, and the 'Made in Japan' statement became highly respected.

However, according to Stading and Vokurka (2003), the Deming Prize, as compared to other quality and business excellence models, does not provide a classified frame of criteria. Instead, it contains ten main categories with each category separated into sub-categories, reaching a total of sixty-six subcategories. This structure lends the Prize flexibility to be applicable in different situations (Veselova, 2019). Moreover, what differentiates the Deming Prize from other business excellence models is that the weight given to all components is equal, and the total quality control process, methodologies, and techniques are supported by a checklist which includes clear definitions of included factors and procedures.

2.4. Malcolm Baldrige National Quality Award (MBNQA)

To mitigate the effects of the massive competition facing the United States manufacturers which became slower in the 1970's and 1980's compared to other nations, notably the Japanese, the Congress of the United States with the backing of Ronald Reagan in 1987, approved the creation of MBNQA as a guide for outstanding and leading quality performance (Toma & Marinescu, 2018). A systematic literature review conducted by Mann *et al.* (2010) found that the MBNQA has been the base for more than 22 national quality and business excellence awards in different countries with its implementation seen in both public and private sector organizations. The MBNQA model contains seven criteria as illustrated below:



From Baldrige Performance Excellence Program. 2017. 2017-2018 Baldrige Excellence Framework: A Systems Approach to Improving Your Organization's Performance. Gaithersburg, MD: U.S. Department of Commerce, National Institute of Standards and Technology. <https://www.nist.gov/baldrige>.

Figure 2. 1 Baldrige Excellence Framework

The framework above shows MBNQA's seven criteria which are leadership, strategy, customers, integration, workforce, operations, and results. However, other stakeholders like partners, suppliers and community are not covered, neither with their results nor with any other criteria.

2.5. European Foundation for Quality Management Model (EFQM)

The EFQM model was established by an expert team organized in 1990 (Escrig-Tena, Garcia-Juan & Segarra-Ciprés, 2019). After more than 25 years of its implementation, more than 30,000 organizations in different fields have benefited from this model within and outside Europe (Suárez *et al.*, 2017). The EFQM model consists of three main parts which are the fundamental concepts of excellence, the criteria designated to measure it, and the logic that ties them together (Nenadál, 2020). The following figure sourced from EFQM (2012) illustrates the EFQM's eight fundamentals of excellence:

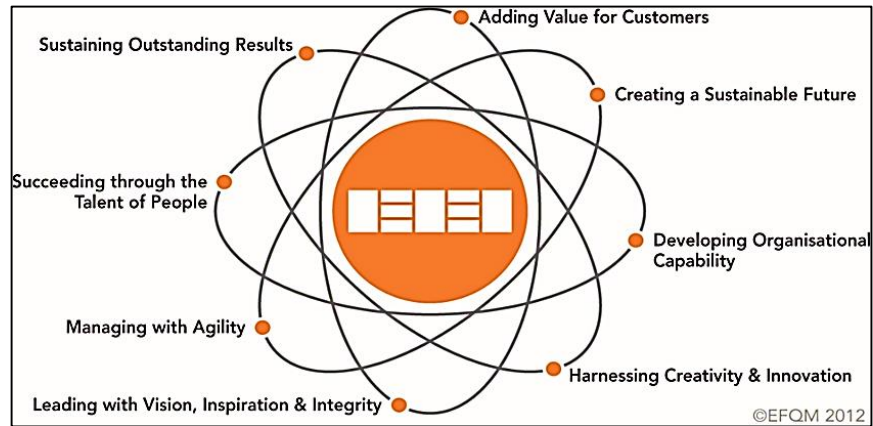


Figure 2. 2 Fundamental concepts of EFQM

The EFQM model contains nine criteria divided into five enablers and four results as illustrated in the figure below sourced from (Calatrava Moreno, 2013):

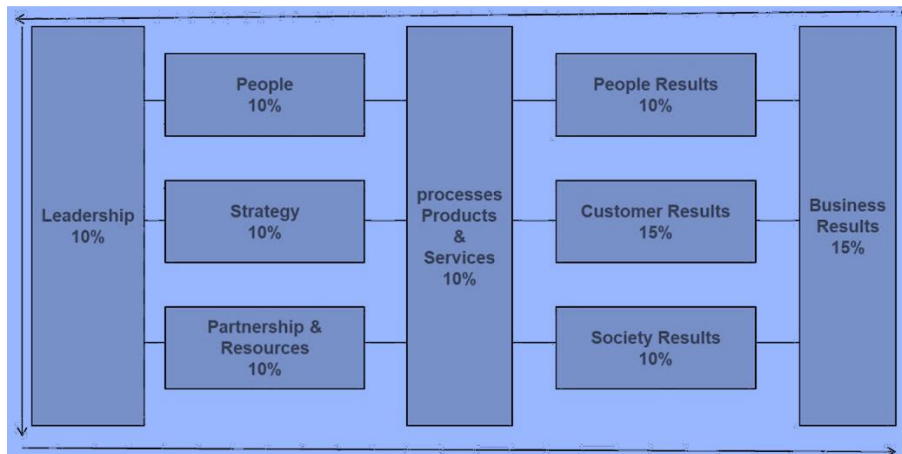


Figure 2. 3 EFQM criteria

The above figure illustrates the nine criteria and the five enablers. Excellent organizations utilize their enablers to achieve and maintain a leading result that far exceeds their stakeholders' expectations (EFQM, 2020). The RADAR (Results, approach, deployment, and AR for assessing the implementation maturity within an organization).

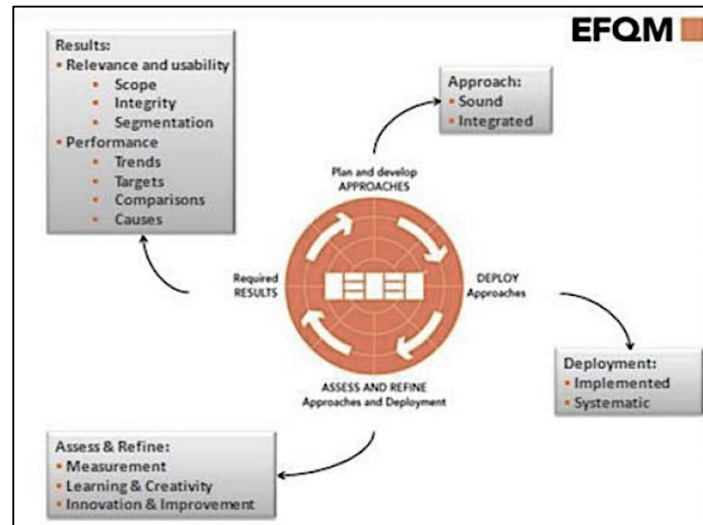


Figure 2. 4 RADAR system implementation

The above figure sourced from (Calatrava Moreno, 2013) shows the implementation of RADAR system according to the criteria in the EFQM model. For the researcher who is a certified EFQM assessor since 2012 and user of the RADAR logic for more than 14 years, it is clear that using this tool for assessment is a very good way for continuous improvement. However, the major disadvantage with this tool is that it focuses on the supportive processes instead of the main functions and services of the core business..

2.6. UAE Fourth Generation of the Government Excellence System

The UAE's 4th Generation Excellence System was announced at the federal level in 2015 as a unique model targeted towards the public sector (Hammad, Dweiri & Ojiako, 2020). The practices of business excellence that were introduced in the country at different points over a period exceeding twenty years served as the basis of the model. The objective of the UAE 4th generation excellence system is to raise the capabilities of the government organizations to ensure the happiness and well-being of citizens and the residents as the country has one of the largest immigrant populations in the world. The figure 2.5 sourced from (Dubai Government Excellence

Program, 2019) and attached below shows the 4G governmental leading entity excellence system:

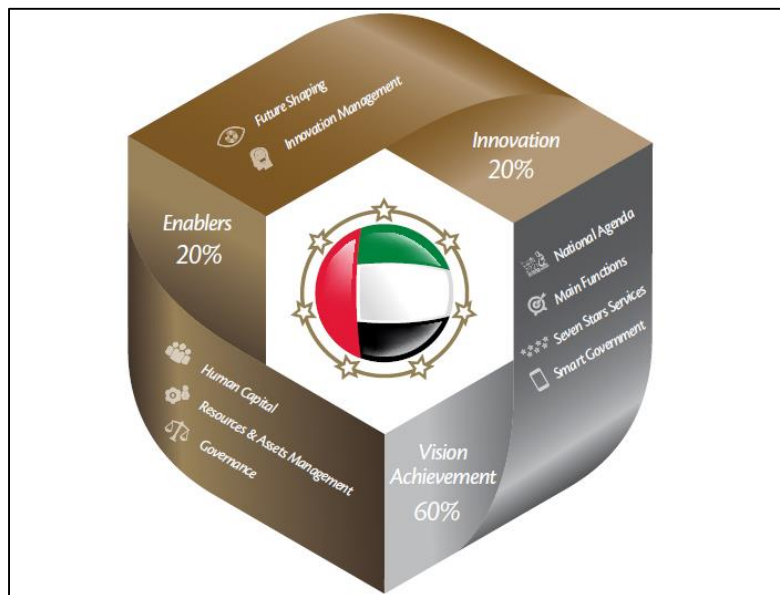


Figure 2. 5 The governmental leading entity excellence model version 1

Assessment Mechanism

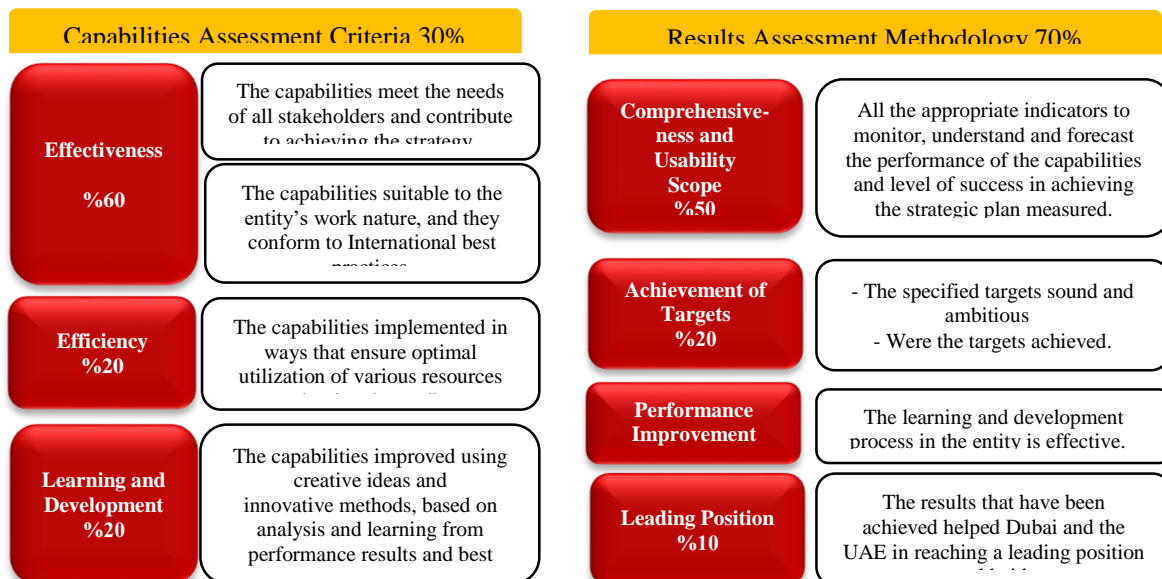


Figure 2. 6 UAE 4G excellence system assessment

The figure above which is sourced from (Dubai Government Excellence Program, 2019)

shows the assessment criteria of the system which illustrates the focus on the results as mentioned before. 70% of the assessment score is reserved for the results of the first three criteria representing 90% of the results assessment score, which is similar to sides of the results assessment in the EFQM RADAR system. The last criterion, which is the leading position, is new in the sense that it differentiates among the government organizations based on their vision and achievement of world class results and ranking.

A comparison between the three excellence models is detailed in the table below:

No.	Criteria	Updated EFQM Model 2020	Malcolm Baldrige Model	UAE 4G Excellence Model
1.	Number of criteria	Nine criteria Leadership, Strategy and HR are similar to MBNQA	Seven criteria Leadership, Strategy and HR are similar to EFQM	Nine criteria HR, and Asset and Resources are similar to EFQM
2.	Focus	More emphasis on the supportive processes and services	More emphasis on the supportive processes and services	More emphasis on the core processes and services of the public organizations
3.	Overall score	1,000 <ul style="list-style-type: none"> • 50% for enablers • 50% for results, • 10% for each criterion • the rest 10% is divided equally between the customer results (criterion 6) and the main results (criterion 9) to be 15% for each 	1,000 <ul style="list-style-type: none"> • 45% for the results criterion, • 12% for leadership criterion, • 9% for integration criterion and • 8.5% for each of the remaining four criteria, • The higher weight reflects more importance 	1,000 <ul style="list-style-type: none"> • Each criterion consists of capabilities part weighted 30% of the criterion weight, and • Results part weighted 70% of the criterion weight, • Weights of each criterion are dependent on the difference and privacy in the nature of the work of the government organization
4.	Scoring weight			
5.	Integration	The role of integration is within the leader's practices in the leadership criterion	The integration criterion is the core of the model in addition to leadership criterion	The integration part is not clear

6.	Interdependency between criteria	The results criteria are enabled by the enablers criteria and the causality relationship is clear	The integration criterion serves as 'brain centre' for linking the operations with the strategic objectives	The interdependency between the criteria of the system is not clear
7.	Corporate social responsibility	Society results which are 10% of the total score is for volunteering (mainly for private organizations) out of their scope of work	Mentioned as one of the fundamentals of the model but not clearly included in the criteria	The social responsibility is part of the sustainability (economic, social and environmental), more applicable for the governmental organizations as it is not allowed to provide anything out of their scope of work
8.	Purpose	Purpose is to promote competitiveness for European companies and manufacturers in the world market by adopting and implementing excellence concepts	Purpose is to promote competitiveness through Total Quality Management	Purpose is to consider the nature and specific type of the government apparatus and serve the strategic needs of the public sector
9.	Type of Organization	Private organizations without any relation with each other	Private and semi-private organizations without any relations with each other	Public with private partnership to perform combined national agenda or common government plan
10.	Assessment mechanism	RADAR logic for linking cause and effect through enablers versus results	Check lists for ensuring the implementation of the model requirements	Results and capabilities assessment
11.	The qualifications of the assessors	Excellence assessors who are EFQM certified without taking in consideration the nature of experience or academic qualifications	Excellence assessors who are trained in the requirements of the model criteria without taking in consideration the nature of experience or academic qualifications	Assessment teams of subject matter experts covering the core functions and the supportive processes
12.	Designed by	European Foundation for Quality Management (EFQM)	National Institute of Standards and Technology NIST	It is designed by the UAE government to serve the public sector

Table 2. 1 A comparison between the three excellence models

(Author illustration based on conducted review)

2.7. Analysis of the Models

Based on the analysis above, it is apparent that there are many similarities and differences between the three models. For example, while the EFQM model and the UAE 4G excellence model have the same number of criteria at nine, the Malcolm Baldrige has seven criteria only. The first three criteria of EFQM which are leadership, strategy, and people are similar to the criteria of MBNQA, which has named the people criterion as workforce. Additionally, there are similar human capital and asset and resources criteria in the UAE 4G excellence system. The total score of the three models is 1,000. The EFQM and MBNQA mainly focus on the supportive processes and services while the focus for the UAE 4G Model is on the core processes and services. The results score for the EFQM and MBNQA are almost the same at 50% and 45% respectively, but the results score in the UAE 4G Excellence Model is more than 90%, as 80% of the assessment score for the capabilities are effectiveness and efficiency which are based on measuring results.

The integration role is clear in MBNQA model which contains integration criterion in the core of the model in addition to a leadership criterion that is directed towards the achievement of the model requirements. In EFQM model, the leadership criterion plays this role. However, the role of integration is not clear in the UAE 4G model as it does not contain a leadership criterion. The causality relationship between the enablers criteria and the results criteria is clear in the EFQM model and in the MBNQA model, however, in the UAE 4G excellence system the situation is different. The relationship between the capabilities and the result in the same criterion is clear, while the interdependency between the model pillars and criteria is not clear.

As both EFQM and MBNQA models were established for private sector organizations, the criteria to measure social responsibility response includes volunteering or extending resources outside of their scope of work. This may not sometimes be applicable for the public sector organizations as

these organizations cannot offer anything other than what is declared in their founding documents. However, the UAE 4G excellence model includes the social responsibility within the sustainability criterion and focuses on the effects of the public organization work on the economic, environmental, and social sustainability factors.

The assessment mechanism in the EFQM model is one of three parts of the model named as RADAR logic. It is a clear and simple mechanism which can also be used as a development tool. In the MBNQA model situation, the assessment mechanism is checking the implementation of the criteria sub practices while in the UAE 4G excellence model, the results assessment is almost like the results assessment in the EFQM model with an addition of 10% for the leading position of organizations due to assessed results, locally or internationally. The difference between the assessment of the capability's effectiveness part and the results as an outcome of the capability is not clear.

The purpose of the three models is the same which is to promote competitiveness of the implementing organization. However, in the UAE excellence model, there is an additional purpose of taking in consideration the nature of the government organization's scope of work, which is different from other organizations. Moreover, it also takes into consideration the partnership between the government organizations to perform the overall government plan. Lastly, the assessors in both EFQM and MBNQA models are excellence qualified assessors who have passed training workshops though they may not have any experience or academic qualifications related to the nature of work of the organizations assessed by them. In the UAE 4G excellence system, different assessment methods and techniques are used. Additionally, the assessors are subject matter experts in the scope of work of the organizations assessed by them in order to maximize the benefits of the assessment process.

In the end of 2019, a modification was done in the DGEP (Dubai government excellence program) 4th generation announced as version 2, which is applicable to Dubai governmental organization and aligned with UAE 4G excellence model illustrated above in figures 2.5 and 2.6. Furthermore, there is an update on the EFQM model 2013 released by the European Foundation for Quality Management to cope with the fresh look, new megatrends, and the global shifts in the world these days. The new updates in the two models tackle some of the gaps mentioned in the previous section and represent real change for the organizations that follow them. However, these updates need more investigation and illustration.

2.8. Dubai government excellence program 4th generation version 2

Announced by the Dubai government excellence program in the executive council in October 2019, there are certain differences from version one (Sheikh Khalifa Government Excellence Program, 2020). An evaluation system stimulates government entities to develop and lead by competing on two levels, the “basic level” and the maturity “level of excellence”. An advanced assessment system that includes new and changing axes for organizations that have leading positions or have reached maturity of excellence i.e., the "elite level" is added. Results-based assessment system to measure the impact of government activities and introduce transparency. Sophisticated assessment reports follow international best practices while a mechanism for cooperation and partnership between agencies allows the transfer of expertise and knowledge.

The introduction of the elite category for Dubai government organizations that achieved world class excellence results in the previous assessment cycle of DGEP was surprising as this changes the way these organizations are dealing with the requirements and with each other. It can be expected that a movement from competing to cooperating and collaborating can be expected to

guide all Dubai organizations to reach new important areas that are in line with the Dubai government's strategic direction and leadership vision. The organizations that achieve 600 points out of 1,000 and above in the last DGEP cycle are in the elite level category and need to maintain this achievement to stay in this category without competing in other awards.

The major difference in the organizational DGEP model is that the criteria have been increased to 10 while it was 9 in version 1 (Dubai Government Excellence Program, 2020).

The amended model sourced from Dubai Government Excellence Program (2020) is illustrated below:



Figure 2. 7 Criteria of government organizations excellence model in Dubai version 2

Therefore, most organizations will be assessed on their results only which reflects that it is a results-focused model where the capabilities will be assessed only in the elite criteria.

2.9. EFQM 2019 Model

Released by the European Foundation for Quality Management in the end of 2019, the new model offers several differences from the 2013 model (Nenadál, 2020). The new update on the model enables firms to expect the future changes and move forward accordingly, leading the performance, and dealing with the changing environment in a more prepared manner (Escrig-Tena, Garcia-Juan & Segarra-Ciprés, 2019). The new EFQM model highlights the importance of the organizational vision, possession of an agile strategy and purpose for the organization to establish a sustainable value. Furthermore, it creates culture in an innovative way, supporting the beliefs of pure quality, and common objectives at the core of the organizations, directing them for continuous alignment and commitment to their long-term purpose and vision.

The EFQM 2019 model promotes “leaders at every level” as an approach for better team work, collaboration, and decision making in each project or team (EFQM, 2020). Another advantage of the new model is that it understands the differences between organizations due to their nature of work, environment, and scope of work and lead them to build a bottom-up model. For this purpose, the new EFQM 2019 model emphasizes the importance of future forecasts, the analysis of the organization, and using intelligence in predicting for running real transformation. The EFQM 2019 model which is sourced from EFQM (2020) is illustrated below:



Figure 2. 8 EFQM 2019 model

As illustrated above, the new model consists of seven instead of nine criteria which makes the model simpler and more cohesive.

As a member of the excellence team in the author's organization, the author took the opportunity of attending one session conducted with the EFQM regional team for reviewing their 2013 model before the new version of the model was released. This session was a great opportunity wherein the author could provide his comments related to the gaps based on the last implementation of the model. It also provided the opportunity to know the future trends and directions which have given this research a clearer and closer understanding of the changes made in the new version of the model.

2.10. Implementation of the excellence models in the public sector

The requirements of the implementation phases for any model are almost the same. As suggested

by the Dubai government's excellence program, the five steps to move to the UAE 4G excellence system are as follows translated and adapted from the Arabic language and adapted (Dubai Government Excellence Program, 2019):

- Establish a team for every main criterion to analyse and understand its requirements. This means that an initial communication to obtain the support of leaders and all employees to meet the requirements of the criteria is created.
- Conduct diagnosis and current assessment to identify the gap between the organization's situation and the criteria requirements. In this stage, there is a need to analyse the past assessment reports conducted internally or by external parties in addition to the criteria requirements to identify the gap and complete a gap analysis.
- Develop an implementation plan and prepare executive action plans including responsibilities, timeframes of the implementation, resources needed, weights and target etc. to bridge the gaps and fulfil the requirements. This importance of the implementation plan as a critical factor of business excellence model implementation has been emphasized (Al Ghufli, 2012).
- Complete the requirements and documentation (Pre-Assessment preparation) by filling any needed applications or matrixes, identifying the initiatives and strong points, training individuals, teams, and management on how to deal with the assessment process to achieve the best possible results.
- Conducting self-assessment to ensure that the organization is on the right track and identify the area for improvements to fulfil the requirement. The post-assessment phase is essential as in this phase, the areas for improvement are prioritized, appropriate comparison is performed, the teams are often re-established, and the cycle is started again.

2.11. Identification of gaps

All three models have their advantages and disadvantages. The EFQM model was established in 1990 while the MBNQA was established in 1987. Since being developed, the two models have become more established and mature with more than eighty-three countries who have established national excellence awards following one of these models (Mann, Mohammad & Agustin, 2010). However, these models are established for the implementation in the private sector while the public sector which is the main concern in this paper has not been the point of focus in them. Furthermore, some requirements are difficult for the public sector organizations to fulfil, like the social responsibility results in the EFQM model, which weighted 10% of the model. Moreover, these two models were developed to be implemented in organizations without any relation with each other and this not the situation of the public sector organizations that jointly participate in performing the overall government plan or agenda. Hence, it has become more difficult when implementing the excellence model by divisions or sections within the same organization.

The need to have a public sector model that contains all the advantages and avoids the disadvantages is essential. The UAE 4G excellence system is a very good start, however, it needs to be modified to avoid some disadvantages such as adding the leadership criteria for integrating the components of the model. Furthermore, the results score from the total score is very high. Therefore, there is a need to pay more attention to the enablers (capabilities) and to develop the assessment tools of the model so that it is clearer and simpler.

The implementation process for any excellence model is like the design thinking process and it is based on the attributes of the organization and its objectives analysis. Business excellence and design thinking concepts believed to be highly suited so the design thinking methodology can be used for BE implementation in the public sector.

2.12. Role of Culture

Having looked at the existing models of business excellence implementation in the public sector organizations, it is important to reflect how the existing culture of an organization can affect this process of implementation and its outcomes. An important paper in this field has discussed how the excellence programs initiated by the Dubai government have applied business excellence with the high degree of power distance prevailing in the local culture (Lasrado & Gomiscek, 2017). The researchers noted that most organizations who have implemented the Dubai excellence EFQM model are already experienced in implementing ISO standards which has instilled the appreciation for following guidelines and, thus, influenced their culture.

Secondly, the researchers mentioned that the training provided through the EFQM model has reduced the impact of the power distance in the cultures of the organizations. This is an important finding as it shows that business excellence frameworks have the ability to address cultural nuances by creating a vision and encouraging a movement towards quality-inspired policy and practices. It is important to mention here that earlier research has shown that culture does affect TQM (Prajogo & McDermott, 2005). In this research, the researchers surveyed 194 organizations which were following the MBNQA. They reported that a hierarchical culture supports TQM in its implementation which can be useful for the Dubai public sector where a higher power distance is expected.

Another study in the UAE reported that some of the cultural dimensions of the country may actually hamper the implementation of TQM (McAdam *et al.*, 2013). These practices included the power distance where supervisors did not involve employees in decision making or allow their participation especially for the immigrant managers. This lack of empowerment and participation affected the adoption and implementation of corrective actions that could arise through self-

assessment. The researchers, therefore, indicated that organizations need to ensure that their successful implementation of organizational practices was further extended to effective people management and development.

Another aspect of culture is the manner in which it can impact attitudes in the context of business excellence. Though not many studies have been conducted linking national cultures with business excellence, it is reported that it does have a role to play in deciding the best-suited business excellence models for a particular region (Xie *et al.*, 1998; Tan, 2002). Comparisons between national business excellence models show that there are several differences between them. These differences can exist due to number and types of dimensions, the amount of weightage given to a dimension, and the kind of award categories for a number of industry and service segments. These differences chosen for various countries and regions suit their particular cultural dimensions making them suited to the particular purpose of encouraging businesses to adopt excellence criteria and fulfil them.

It is not only culture that determines the differences in the kind of business excellence models chosen, but also, the economic conditions prevailing in the country. For instance, a country struggling to meet its economic objectives would adopt excellence criteria that allow organizations to make profits and pay their taxes contributing to economic growth. Developed nations who are doing well economically can afford to establish business excellence criteria that focus on innovativeness, investments in learning, and sustainability. Consequently, Williams et al. (2006) have asserted that national culture does play a role in determining the best fit for the choice of business excellence model. However, the researchers stress that there have been no studies that have enquired into the influence of national culture on the business excellence models or the realisation of the specific criteria within them.

Still there are indirect ways of assessing the impact of culture on attitude. For instance, as market situations vary, the weightage given to various business excellence criteria will vary (Williams *et al.*, 2006). Further, the business excellence criteria will affect the strategic focus of the organization, helping create a cycle of cause and effect relationships.

These differences as per culture are controversial. Conti (2001) has pointed out that this controversy of differences between business excellence criteria can be resolved once the purpose of the application of business excellence models is established. If the purpose is to allocate rewards, provide rankings, and infer the comparative performance of organizations then indeed there is a need for standardization of the criteria. Judging across criteria is not possible without validated and standardised measures.

On the other hand, Conti (2001) adds that if the purpose of applying business excellence models is to improve the performance of organizations then a specific model has to be customized with the particular organization's criteria, weightage, and sectors considered to be relevant and important to the organization. In such circumstances, it will be the organizational factors and culture that play a prominent role in deciding the business excellence framework. In the globalised world with organizations expanding their operations across geographies, the latter form of evaluation for business excellence makes more sense. At the same time, the gap in literature examining the role of culture on business excellence persists and needs research attention. Further, organizations will need to assess their own cultures to identify such practices as support their performance towards business excellence, amend them, and make a move towards organization-wide implementation of TQM.

Though studies have not explored the role of culture on business excellence, there is a lot of literature available that finds culture to affect attitudes. Al-Esia and Skok (2014) studied how Arab

culture affects the attitude towards knowledge-sharing with multi-cultural workers. This is an important attitude as the Arab countries support a sizeable immigrant population coming from diverse nationalities and faiths. The study reported a negative impact of Arab culture on the knowledge sharing attitude stressing that the cultural values of trust, status, power, informal relationships and strong social networks are not such that can be easily reproduced with workers who are on temporary job roles.

The researchers particularly noted the value of “wasta” which denotes a preference for working for people within one’s social network with a high collectivism value as per Hofstede’s cultural dimensions. The interpretations of wasta differ with authors defining it as a positive construct where Arabs support each other in overcoming bureaucratic obstacles and gaining access to resources (Tlaiss and Kauser, 2011, 2019). Wasta is also described as being critical for business dealings and for ensuring that workers share knowledge and support others (Hutchings and Weir, 2006).

However, wasta has been linked with several negative connotations. It is compared to a form of favouritism where outsiders are kept outside the circle and not allowed access to resources. Calling it a form of cronyism, researchers believe wasta can prevent organizations from achieving collective goals when the workforce is diverse (Barnett, Yandle and Naufal, 2013). Wasta takes on an even more important role as a cultural dimension when studies link it to organizational performance. Ahmad and Daghfous (2010) note that large organizations of the UAE have found knowledge sharing and new practices a challenge due to their traditionalist views. This is a serious concern that both knowledge sharing (Gloet and Samson, 2017) and change (Douglas and Vora, 2013) are important for organizations to achieve business excellence. The traditionalist views

pointed out in Ahmad and Daghfous study relate to a hesitation to trust others for fear of security breaches, thereby casting a shadow on knowledge management.

Within the UAE context, Seba et al. (2012) bring the importance of culture even closer to the context of the present study by pointing out how the public sector in the country finds it difficult to implement knowledge management due to trust, leadership, and technology issues. They also noted organizational culture and time constraints to play a role in knowledge management attitudes. This assertion is corroborated by Skok and Tahir (2010) who opine that difficulties in implementing knowledge management within the Arab world organizations is due to the organizational culture, leadership, and the lack of training. Though these factors do not identify the national culture as a contributory factor, the assertion that it is the organizations located in the Arab countries that seem to have these issues, support the notion that it does play a role in affecting attitudes.

In one of the important studies linking national culture with organizational culture, Klein et al. (2009) note that the organizational culture emerges from consistency in practices while the national culture is a result of consistency in values. As in the case of studies linking national culture with business excellence, there is a dearth of studies looking at how national culture affects organizational culture. In this case, Klein et al. (2009) three major contributory reasons. The first, according to them, is the difficulty in drafting methodologies that can capture the research objectives. The second is that tools developed to measure these two forms are culture consist of different constructs entirely. Lastly, national culture measures deal with cultural values which make them very different from the organizational values and measures.

Still, it is important to study national cultures for their impact on organizational culture. The employee behaviour norms which emanate from their particular motivations are culture dependent

(Hofstede, 2011). Laurent (1983) had shown that national culture had three times more influence on employee behaviour than any of the other demographic factors like age, qualifications, designation, or the kind of organization. Moreover, multi-national organizations show that despite the pervasive organizational culture, different branches possess unique characteristics that reflect the national culture. With national culture showing a high degree of criticality governing employee attitudes and affecting organizational results, it is important to define the UAE culture.

Hofstede who is considered to be the father of cultural dimensionality defining how national cultures vary, has studied the Arab culture with samples of behaviour collected from Egypt, Iraq, Kuwait, Lebanon, Libya, Saudi Arabia, and the UAE (Hofstede, 2011). Out of the 53 countries assessed across dimensions, Hofstede (2011) placed the Arab countries at the seventh position in power distance signalling a high degree of differences between the hierarchies and other power sources. This power distance is manifested in the above mentioned value of *wasta* which though positive for the in-members of the group, creates a huge divide against the expatriates and immigrants. Atiyyah (1996) goes so far as to call the Arab culture closed with its people unreceptive to the expatriates working in their country. He stresses the need for greater synchronization of the efforts between the Arab citizens and the foreign workers to reduce the gap and facilitate the organizational synergy.

Further evidence in this regard is provided by Kuehn and Al-Busaidi (2000) who state that Arab managers work in ethnocentric circumstances. The researchers also believed that the Omani managers in their study were less committed to their work and believed in abstract values of work compared to the Indian immigrant workers.

The next cultural dimension measured by Hofstede is uncertainty avoidance which seeks to establish the degree of uncertainty tolerated by the members. In case of Arab countries, the

uncertainty avoidance is high showing that the people prefer to have institutions that confirm stability and clarity (Hofstede, 2011). Jones (2008) has supported this notion by asserting that the UAE workers are highly culturally sensitive and insecure which can be seen in their workplace behaviour as they seek to protect their positions. In Jones' (2008) study, the UAE bank managers' motive to avoid any insecurity affected their performance in training, fetching them low scores in collaboration. As a manifestation of this cultural dimension, the regulations in the Arab countries are strict and extensive. This value can have insights for business excellence designers as extensive and comprehensive guidelines may be appreciated by managers looking to improve their organizational practices.

The third cultural dimension explored by Hofstede (2011) is the extent of masculinity in the Arab countries. This dimension measures the degree to which the masculine values of task achievement, control, and power practised in a society. In the Arab countries, the level of masculinity is equivalent to the world average. This finding shows that the status of women in the mainstream media is misrepresented. Klein et al. (2009) comment that this result indicates that the limited rights of the women are, therefore, an indication of the religion rather than the culture. This is a misleading statement, indicating ethnocentrism on the part of the researchers as culture of a region cannot exist independent of its religious beliefs. Moreover, the researchers have no scholarly or empirical basis to extend such an irresponsible statement.

The next cultural dimension is of individualism which measures the extent to which a region prefers individualist to collectivist values. In the context of the Arab countries, the collectivism values are higher. This finding is supported by earlier studies which have noted *wasta* as a manifestation of collectivist values (Hutchings and Weir, 2006; Tlaiss and Kauser, 2011; Barnett, Yandle and Naufal, 2013). Collectivism offers support for the achievement of business excellence

objectives as most criteria require team work and shared objectives. In societies that value individualism, one of the prerequisites for achieving business excellence is to ensure that all employees shared a common vision and can see a link between their performance, personal motives, and organizational goals (Vroom, Porter and Lawler, 2005). As a basic tenet of expectancy theory of motivation, the link between valence, expectancy, and instrumentality becomes critical in individualist societies. For collectivist societies, the need for social relationships itself acts as an individual motivator, helping support the shared nature of goals and task allocation.

In respect of cultural values, Schwartz (2012) has conducted an analysis of fundamental values that guide culture-specific behaviour using responses collected from forty countries. He states that these values manifest in ten individual dimensions and seven national dimensions. The national dimensions in his study are derived from the responses noted for three basic social issues. One such critical dimension is the choice between conservatism and autonomy. Cultures considered to be highly conservative believe in social order and respect for traditions, a belief in collectivism and maintaining status quo. The autonomous cultures, on the other hand, emphasize unique individuals, stress on attributes found in people over groups, and reward innovation and change.

It is evident that the Arab countries would feature higher on conservatism based on the body of evidence linking them to higher collectivism, power distance, and uncertainty avoidance. However, studies linking conservatism or autonomy to business excellence are rare. In a study conducted by Lin (2018), conservatism was measured as a construct of four factors of family ownership, family management, family external supervision, and family control. These factors were assessed against the competing factors of alignment and entrenchment effect for achieving business excellence. The results showed that higher conservatism where the families had higher

control, supervision, management rights, and ownership led to excellence. This study was located in Taiwan but it has relevance for the Arab context as it shows that Western values and beliefs and even studies guided by researchers who follow them may not hold answers for the cultural context of societies with different ideals.

The success of family-owned organizations in Taiwan can be interpreted in the context of other countries. Studies exploring organizational culture as a subset of national culture in the UAE are rare. At the same time, their rarity is a concern as it is unclear how national culture affects organizational values in a country which is not a mirror image of other Arab nations. With far greater number of immigrants and a higher diversity of organizations coming from many countries, there is a need to assess how national culture impacts their functioning. In one of the rare studies of organizational culture in the context of national culture in the UAE, Suliman and Hayat (2011) reported that organizational culture has a very weak impact on individual behaviour within the UAE. Individual behaviour in the UAE is influenced by the national culture and the regional identification of the employees who place their tribal and familial affiliations at a priority.

Klein et al. (2009) report that the Anglo ideal is a constructive style of societal values while the Arab ideal is defensive. As demonstrated earlier, these researchers demonstrate a clear ethnocentric bias in their study which is again evident in the terminology assigned by them to the Arab ideal. The definition of the Arab ideal goes against their nomenclature as they describe the defensive stance as one in which managers are working towards positive goals and striving for achievement. Members work with creativity and support one another with a strong sense of camaraderie to support each other's growth and development. The researchers, however, cautioned that organizations who possess a culture contrary to the national culture in the UAE may fail to reap these benefits. They share an example of organizations where performance is valued yet

authority and prestige of a select group of members is given priority can end up sending wrong signals and affecting the performance.

Further, in the Klein et al. study (2009), the researchers noted that in the sample organizations, there was no evidence of such dissonance between national and organizational cultures. All sample organizations within the UAE possessed a constructive culture with initiative valued for individuals, communication effective for all hierarchies, and individuals encouraged to take their decisions and be responsible for their progress. The researcher stressed that constructive cultures are those which believe in performance rather than conformance, but they still reported that a defensive culture can make the realisation of a constructive culture for UAE firms difficult. These studies, therefore, suggest that there is a national culture in the UAE which goes against the notion of a constructive or positive organizational culture. However, they fail to consider that organizational cultures can be of various kinds and do not need to conform to the ideals of a Westernised notion of individualism and low power distance. Secondly, when their research suggests UAE organizations to perform well on critical criteria of performance, communication, and independent decision making, they still reiterate the dangers of adopting the national culture. As the existing studies are few, it is suggested that more studies in this phenomenon are conducted by impartial researchers who can look into the fit between national and organizational cultures for the UAE.

National culture is believed to affect the models given by people to their organizations and the meaning attributed to them (Trompenaars and Woolliams, 2004). These researchers developed a model of measuring the link between national and organizational culture using two criteria of the level of equality and the orientation to the person or task.

Depending on these two criteria, the researchers developed four categories of constructs defining the cultures across countries studied by them. These categories include incubators, guided missiles, family, and Eiffel tower. The Arab countries which are believed to have a high levels of both hierarchy and orientation to people are categorised as family. In this category, the results of the organization are derived from the power exerted by its members who act as one entity. As the power is wielded by individuals, it assumes political connotations because task and expert power sources are not utilised. Lin study (2018) assume importance as they show that it is the coherence between the national and the organizational culture that is contributing to the success of the organizations.

Lastly, it is important to consider the culture of public sector organizations within the UAE. Among the Arab countries, the UAE is unique in its early adoption of public sector reforms (Al Ghufli, 2012). By devoting sufficient resources, an able leadership, and administrative flexibility, the country has been able to spearhead its public sector reforms. These changes are evident in the amount of time taken to respond to customers and the ability to acquire a competitive edge. However, transparency and distrust still prevail creating the need for business excellence approach.

2.13. Design thinking approach as a tool for business excellence implementation

Design thinking is chosen as the framework for guiding the implementation of the business excellence model in the public sector organizations of Dubai. This choice is inspired by the similarity in philosophy behind the phases of excellence implementation and those of design thinking. For instance, ensuring excellence within government working culture requires the features of human-centred innovative activities, visualized ideas, and strategy determination. The features of these structure match and can be beneficial for design thinking's development process. This study intends to identify such a new methodology for insertion of excellence within the

government working culture.

One of the barriers in efficiency for government organizations is that they seek a proper method to implement the excellence requirement in their daily work activities. In other words, they want to know how can people in government organizations fully understand the excellence requirements and apply those requirements to their daily work? This means that there is a need for developing government excellence from requirements of meeting task guidelines to an implemented culture. This transition is possible by designing the journey of the users from point A to point Z, which can be better achieved through the implementation of design thinking approach.

A comparison between the attributes of business excellence and design thinking approach will help judge the fitness of this approach for business excellence implementation. The work of Chou (2018) who compared the attributes of the social entrepreneurship and design thinking has applied a similar approach to deriving learning from the two concepts and prescribe a new model of implementation.

Bobrek, Majstorovic and Sokovic (2006) find that growing number of organizations today struggle to adapt to the challenges of globalization and increasingly complex business environment. According to the authors, organizations struggle not because they do not have competent resources but because they cannot understand these changes and do not apply adequate management tools enough. The process of identifying objectives is well known in management theory by earmarking a purpose, vision, business strategy and policies and speeding them through the organizational structure. In today's complex and rapidly evolving world, both economic and non-profit organizations will achieve their planned goals successfully only by identifying the right objectives and policies on time and by finding ways to execute them effectively. A continuous analysis of the connection between the identified objectives and values of characteristics or economic indicators

is also of great importance. It must be subject to continuous evaluation and overview of an effective organizational information system. Contemporary organizational and management theory publications underline the importance of the design approach to management systems as is typical in technical systems (Edmondson *et al.*, 2019; Maier & Rechtin, 2009).

It is known that developing a program is the best way to understand it. The design approach needs designers to learn how to use what they already know, learn how to understand what they do not know, and learn how to learn what they need to know. Ultimately, creating a design involves an understanding of how the actions of one part of a system affect and are influenced by other parts. A particularly important part of the design methodology are the methods for assessing, evaluating, and optimizing system performance which are of great importance to understand the system completely. Moreover, they can support the organization through adequate planning and design, and finally, for generating reliable statements on the efficiency and effectiveness of the system. Consequently, an independent set of variables is a special case of a more general interdependence scheme. When structures become more complex, the fact of interdependence becomes more apparent.

Knowing that interdependence requires a different way of thinking than only relying on analysis, managers need to think about processes (Oxman, 2017). It requires breaking down what it is trying to learn and attempts to explain the actions of the individual decisions taken during the course of a project or process. Finally, it attempts to integrate the comprehension of the pieces into a whole which is then interpreted within the generated context. Thinking about systems requires another method. It places the system in the sense of the larger world that it is a part of and studies its role in the larger whole.

For nearly four hundred years, the theoretical method has remained largely unchanged but design

thinking has already passed through three distinct waves of transition (Micheli *et al.*, 2019). The first generation of systems or design thinking (operations research) presented the problems of interdependence within the context of mechanical (deterministic) systems. In the sense of living systems, the second wave of systems and design theory (cybernetics and open systems) tackled the double problems of interdependence and self-organization (negentropy). The third generation of system thought (design) reacts to the triple challenges of interdependence, self-organization, and socio-cultural structures in the context of choice (Bobrek, Majstorovic & Sokovic, 2006).

2.13.1. Human-centred focus

People are both the target and the tools of business excellence. Therefore, business excellence will always be related to the practices of people. Excellence of an organization is the sum of its people's excellence while design thinking is a methodology of human-centred practice. Therefore, both concepts are highly related to the attribute of human-centred focus. Being human centred is important as suggested by Vechakul, Shrimali and Sandhu (2015) who state that human-centred design (HCD) can improve community engagement, speed up the timeframe for defining, planning, and implementing issues, and develop creative solutions that tackle complex issues.

Historically, the development of computer systems was mainly a trend driven by technology with technologists claiming that "users can adapt" to whatever they create (Oviatt, 2006). The human-centred design proposes that a more promising and sustainable approach is to begin with modelling the natural behaviour of users so that the interfaces are more intuitive, easier to learn, and freer from performance errors. The author argues that an inevitable prerequisite is a human-centred architecture that integrates cognitive sciences, linguistics, and other fields requiring multidisciplinary expertise for advancing interfaces in the future.

Oviatt (2006) has further suggested that a human-centred design approach will leverage a more

functional and reliable framework by modelling the pre-existing actions and language patterns of users rather than trying to retrain behaviours that are deeply ingrained. It can also direct user feedback towards processability in a straightforward manner, using techniques that are neither seen nor objectionable. One future challenge in areas such as mobile, omnipresent, and multimodal multi-sensor interfaces is for human-centred architecture to more accurately model human contact and interaction patterns and usage contexts. Another general human-centred design strategy associated with multimodal interfaces is to model the normal multimodal communication habits of users and create a multimodal interface based on fusion that allows users the flexibility to practice their intuitions on when to use which mode or a combinations, thus, improving the robustness of the system (Oviatt, 2003).

Human-centred multimodal interface design understands that people are skilled in multimodal communication and know when to use a specific mode to communicate accurately. They will use the input mode that they consider being the least likely to convey relevant lexical information including switching modes when an error occurs (Oviatt, 2017). Their communication can also be easier and simpler to handle when using multimodal rather than unimodal communication. In a telecommunications survey, error analysis showed that up to 86% of all task-critical errors could be avoided simply by providing people with a second input mode. These are all user-focused explanations why multimodal interfaces help to dramatically improved error avoidance and recovery Oviatt (2003; 2006; 2017). Besides handling errors, users react to dynamic changes in their cognition limitations and cognitive load by moving to more multimodal collaboration, as the load increases with work complexity.

As a result, a robust multimodal interface helps users handle their cognitive load themselves and reduce the associated output errors when solving complex real-world problems. In short, the

human-centred nature of multimodal interfaces allows users to adapt efficiently in a way that extends their range of problem-solving capabilities assisted by computers (Chen *et al.*, 2016).

Many complementary and relevant user-centric design strategies include user-adapted interfaces (e.g., level of experience, native language) and real-time adaptive interfaces (e.g., the actual subject of attention of a user), in which the device adapts to the user specifics and performance status. Through a user-centric design viewpoint, it is realized that rather than otherwise, users can and do adapt to the systems. However, as adaptive systems become more popular, useful, and sophisticated, the long-term research agenda will be the development of human-computer interfaces which are mutually adaptive (Riva, Vatalaro & Davide, 2005).

The two examples above demonstrate a human-centred interface design approach to modelling behaviour that happens naturally with a focus on predictive modelling that elucidates the basis for behaviour that is prone to errors or difficult to process. They also demonstrate interface design techniques to direct user actions in a straightforward manner that is more consistent with system processing capacities, exploit user experiences, and build interfaces that enable users to adapt to evolving task requirements. One theme common to all these examples of designs that reduces the cognitive load of users by aiding performance and removing unwanted interference is their focus on human-centred design. Cognitive Load Theory (CLT) focuses on developing interfaces that decrease extraneous cognitive load so that the intellectual resources available to people can be devoted to their main mission and task.

As a result, human-centred design and approach are bringing in new changes in management and flow of operations which are common to design thinking and business excellence. This approach can facilitate the achievement of implementation outcomes while also ensuring that the organization and its management remains relevant and cognizant of the internal and external

changes in their environment.

2.13.2. Strategy and goals

Business excellence seeks challengeable objectives which should match specific strategies for the achievement of goals. Design thinking also seeks business excellence goals with a specific design strategy. Both concepts are highly related to the attribute of strategy and goals. According to Wattanasupachoke (2012), most strategists find the concept of design thinking to be a tool for developing new strategies. It is claimed that designers use the 'innovative thinking process' to encourage out-of-the-box creativity and lead to organization-wide focus on innovation. With regard to the effect of design thinking on the innovativeness of the organization, the application of design thinking to business operations significantly increases the innovativeness of an organization (Beckman & Barry, 2007). The design thinking methodology starts by having a clear understanding of customer needs and integrating them with the innovative ideas of the employees. Additionally, the technique emphasizes encouraging consumers to participate in all major steps for the growth and development of innovative products and services, thus, establishing a firm's innovativeness. However, design thinking does not have a clear relationship with innovation as per the results of the empirical data analysis (Brown & Wyatt, 2010). It is because the methods concentrate primarily on enhancing the business processes, as well as, cultivating innovation in the idea of the product and service. This focus does not lead directly to higher results. In short, applying design thinking to business management and operations brings imagination which can be turned into customer innovation. This also leads to better financial results in the future (Wattanasupachoke, 2012).

Elsbach and Stigliani (2018) find that design thinking involves a problem-solving methodology that incorporates techniques that are more commonly used by designers of consumer goods,

systems, and environments (e.g., designing a new vehicle or setting out a new airport). Although design thinking was initially implemented as a methodology that would work better if incorporated into an organization's culture, most early design thinking research concentrated on defining the practical techniques and approaches that could be used to solve management issues. Researchers have only recently begun to explore how the application of design thinking could apply to structures at the organizational level such as the organizational culture. Moreover, most strategists are gradually embracing a definition of design thought. This is seen as an essential step in generating creativity for businesses to grow effectively (Clark & Smith, 2008; Wylant, 2008).

It has been widely accepted that the design process will bring value to the company's goods and services as it helps to develop new looks for brands that stand out from those of their rivals while also creating a quality brand identity. Furthermore, smart design leads to higher operating efficiency, and therefore, reduces the manufacturing costs as the development cycle becomes less complex (Hacker, Sachse & Schroda, 1998). This results in a competitive advantage for a company through better distinction and performance (Wattanasupachoke, 2012). Yet there is more to design than optimizing the quality of a product. The ultimate advantage of the design is achieved by integrating design thinking with business planning and creating an operating model (Clark & Smith, 2008; Martin & Martin, 2009).

The creative thinking process of designers is intended to promote strategic thinking, which is a way to instil an imaginative thinking process in companies that can lead to several improvements in their business operations (Martin & Martin, 2009). In the long run, it can also create an enduring competitive advantage for companies (Micheli *et al.*, 2019). Therefore, learning in greater detail on how to apply design thinking to strategic approaches is useful. It helps companies to innovate in goods and services, operational processes, and business models (Wylant, 2008).

There is not much research on the incorporation of design thinking and business strategy to boost business efficiency particularly in Asia. However, merging design thinking with business management and strategy development is becoming more important (Clark & Smith, 2008; Wylant, 2008). It can be seen that many leading global companies are making use of design thinking methods in their management operations. A design thinking process is made up of three main principles that build innovative strategies and business designs (Von Thienen *et al.*, 2018). The cycle begins with inspiration which significantly stimulates the motivation of human resources in companies. This typically comes from a clear comprehension of the concepts and desires of the customers. Generating ideas is the next move which deals in advancing innovative concepts by gaining information about the consumers for practical purposes and producing prototypes. The final step is that of implementation and integration. It is an approach that combines the creation of products with strategies and business models, helping build both the product ideas and their management (Brown & Wyatt, 2010).

Finally, organizations serious about extracting the best implementation outcomes from their business excellence frameworks have to base their management systems and processes on the human-centred approach (Boy, 2017). Humans are not only the customers of the organization; they are also critical production tools to meet the goals by following the strategy.

2.13.3. Innovation approach

Innovation is always an essential part of business excellence since organizations need to innovate to fill the gaps between their limited resources and optimistic strategic objectives. Design thinking methodology also applies an innovative approach to its design process. Therefore, a focus on innovation is another commonality between the design thinking approach and the business excellence framework. Inspiration which constitutes the first step in the cycle of design thinking,

needs the ability to identify business issues and track incidents that directly impact activities like identifying the market opportunities and obstacles. It is also important for employees to target groups of customers and to learn every aspect of their preference.

The researchers have built an empathic design research approach that draws on the individual and the designer's attributes (e.g., context, physical skills, and education) to ensure that more meaningful design outcomes meet the actual needs rather than their presumed needs. Recognizing that all people have an empathetic horizon (a limit to their information, experience, and awareness), the designer should invest in more learning in direct consultation and cooperation with the users. Results in well-developed products that are easy to use contribute to the quality of life and freedom of an individual.

Owen (2006) had suggested that the term 'innovation' was reaching a buzzword status which was tragic since the ideas it encompasses, and those that push it, are both important and elusive. According to the author, we cannot afford to let them fall out of consciousness simply because words indexing them are out of fashion. Since then, innovation has become a critical criteria for the survival and sustainability of organizations which are working hard to gain the first movers advantage in the time of the fourth industrial revolution (World Economic Forum, 2015; Chandler, 2020). However, its elusive nature remains a challenge for organizations today who have to strive to develop systems that can achieve it while not compromising on their level of quality.

Naturally, creativity is of great importance to design thinking as it is to the thought and learning of science in every field. However, characteristics other than imagination are also important in this endeavour but remain mysterious as they appear to be less common. Owen (2006) nominates, among others, the following from the design sector as important and invaluable for innovation: Conditioned Inventiveness, Human-centred attention, Eco-centred concern, ability to imagine,

measured optimism, adaptability bias, the propensity to multifunctionality, systematic vision, a professional view, capacity to use language as a resource, team alignment, facility to escape the need for preference, self-governing pragmatism, capacity to systematically work with quality information, and knowledge. For designers, creative thinking is oriented towards inventing as compared to a scientist's discovery. Designers seem to be more interested in the issues of “what” than in the “why” of scientific interest. Design innovation, however, must cover more than simply innovation. The design looks to ensure that what is generated is not only innovative but also within the context of human-centred and environment-centred measures regulating the efforts of the designer (Owen, 2006).

Design thinking has developed a second universal, meta-level client in recent years: the world. Present-day philosophy positions environmental concerns as the key restrictions on the design process at a level with human interests. One very visible consequence is environmental design. The fundamental value of human and environmental-centeredness is the commitment that any project should recognize the best interests of humankind and the world (Stackowiak & Kelly, 2020). In order to do so, they have the option to working virtually. Designers can now envision ideas across a variety of platforms, offering a unifying vision of things previously conceived only in conversations. This development has made it easier to comprehend and visualize the finished product among all team members; an enterprise which was affected by individual perception before.

In the past few years, the growing attention to innovative processes in manufacturing and information technology has internalized a trend traditionally practiced by radical designers. The creation of innovative goods capable of meeting the needs of their consumers in a specific way has motivated designers to pursue innovation as their first choice. Design thinking today has adopted

the idea to address business problems with the view that the management approach should be flexible wherever possible, for instance, in development to meet the changing needs of users (Micheli *et al.*, 2019).

Another important aspect of design thinking and business excellence is that problem-solving need not be monofunctional. From solutions to problems, designers regularly search for multiple dividends. This difference between designers and scientists can be reflected with an example. In an issue of a popular science magazine, the cover story was about the six emerging techniques for preventing global warming (Dunne, 2018). The story mentioned recommendations made by the scientific community during a specially invited meeting with officials from the White House. All six ideas for the research were significant macro-engineering ideas. On the other hand, the three macro-engineering projects proposed in the award-winning Project Phoenix Institute of Design (also stated 14 years earlier in Popular Science) all had significant economic benefits in addition to the global warming benefits (Owen, 2007). This example suggests that creative thought, while dwelling on details, holds the larger picture and its opportunities in mind much better than the focus on details alone. Design thinking is, therefore, completely holistic. Modern design approaches problems as system problems with incentives for structural solutions that include blends of hardware, software, processes, policies, organizational principles, and everything else required to build a comprehensive solution (Parnell, Driscoll & Henderson, 2011).

General wisdom today suggests that the trend in expertise is towards greater specialization. Therefore, success can come more readily to those who choose to specialize early and prepare their training as necessary. Conversely, design thinking is strongly generalist in planning and execution. There is a great need for specialists who can interact through disciplines and put together experts from diverse fields in a concerted effort (Susskind & Susskind, 2015). The broader the scope of

the knowledge base, the more likely the motivation for imaginative creativity. This is an important insight for business managers who, while shifting towards the role of specialists, have to remember to build capacities to handle multi-disciplinary teams.

Another important insight comes from the study of communication in design thinking and its application in business management. Diagrammatically, visual language is used to interpret ideas, expose and describe patterns, and to clarify their fundamental essence with complex phenomena. Mathematical language is used to answer “what if” questions where approximation can determine feasibility by estimates that are not exact but near enough to support a concept or alter a line of reasoning. Verbal language is used to push creativity where information is missing and communicate relationships that are not visually obvious (Owen, 2007). Business managers can use this insight to weave communication in their existing processes to deliver instructions for completing tasks while also pushing for the need to think out of the box.

The decision-maker’s task is to choose between alternative solutions which arise as a result of various approaches to problem solving. Design thinking approaches each choice as a definitive decision. Before moving on to making decisions, the designers search for ways to “have your cake and eat it too”— a curious contradiction. However, the ambitious, innovative designer scans the competing alternatives for their basic features and discovers ways of reformulating them in a new configuration. When this method is efficient, the outcome is a solution that avoids the decision and incorporates the best of both choices possible (Martin & Martin, 2009). In this way, design thinking brings the capacity to widen the boundaries and create solutions that make it possible to incorporate different choices.

It is important to discuss that design is an environment where inventiveness is highly regarded. The best design thinkers realize that many of their designs may not be practical and realizable at

least in the currently available technology and resources. They still strive to use a latent sense of the concrete to control their flights of imagination. In this choice, the decision lies somewhere between the flight to the far limits of what can be conceived and to the tether of the conceivable. Such thinking believes in exploring openly for all options while retaining a rational hold on the cost estimate that can be met and functionality that can be accomplished in the background (Stackowiak & Kelly, 2020). Again, this approach of finding the middle ground between creative flight and rationality is inspiring for business managers.

As design work progressed and design methodology advanced, design processes were developed and refined using component methods and tools. Structured Planning, as one of these processes, includes a tool-kit of methods for a broad range of planning activities covering ways of gathering information, extracting ideas from it, arranging it optimally for conceptualization, assessing outcomes, and transmitting a strategy to the public and follow-up teams in progress (Elsbach & Stigliani, 2018). Tools include relational methods for managing knowledge that apply to various conceptual problems where complicated solutions for systems are necessary or desirable. These are available for everyone working on a planning team, allowing us to have access to systemic elements of design thinking.

One of the important aspects of design thinking is that its attributes that set it apart from other frameworks are not discussed in detail in scholarly literature. Rather they are learned almost unconsciously in school assignments or on the job as implicit information. Where they come into play most effectively is brought into the innovation cycle by those with various beliefs and training, for instance, from the physical sciences, arts, political and social sciences, and engineering, among others, in combination with other kinds of thought. Design thinking may be implemented as a project or planning service. But if design professionals actively incorporate team members, it can

be made a more immediate part of the process, and most important of all, it can be systematic if team members are able to understand and practice their principles individually.

In short, through design thinking, the creativity cycle can be greatly enhanced. A team will use it as an alternate way of thinking. A team member qualified as a design professional will use it for a company. Furthermore, it can be used to analyse in-depth challenges and opportunities found in the innovation process, away from a team in advanced support projects undertaken by design professionals. To summarize, the innovative approach of design thinking has several points of interest for implementing the business excellence framework and for guiding the business managers.

2.13.4. Altruism

The ultimate goal of business excellence in government sector is the happiness of stakeholders and improving the life of human-beings. Design thinking methodology applies new ideas to create new products in society. Both concepts are highly related to the attribute of altruism and have been made even more so by researchers who are trying to link it to social entrepreneurship projects (Chou, 2018). For managers attempting to implement the business excellence framework, altruism can manifest in attempts to improve the existing systems, processes, and policies for the benefit of the internal and external stakeholders.

2.13.5. Collaboration approach and brainstorming

Business excellence involves a variety of stakeholders, such as customers, suppliers, partners, employees, society, and many more who collaborate together to achieve the organizational objectives. Design thinking methodology also needs project team members from diversified backgrounds to collaboratively solve the design concerns. Both concepts are highly related to collaboration and brainstorming approaches and can contribute important pointers to do so. It is

inevitable that good interpersonal skills are a part of the professional collection of tools for designers as they work for clients. Designers have increasingly been collaborating with other colleagues for delivering large projects which has built the capacity for team work and collaboration in them (Manzini, 2015). This growing need for teamwork affects design thinking today as designers frequently work closely with other designers and experts from other fields. Designers are a highly valuable commodity on multidisciplinary teams because of their characteristic ability to generalize, interact through disciplines, work systematically with contextual knowledge, and envision concepts (Hacker, Sachse & Schroda, 1998).

2.13.6. Technology usage

Technology in business excellence is a vital tool to achieve higher number and quality of positive results in all business aspects through both information technologies and operational technologies. Design thinking methodology also needs computer technologies and tools for carrying out its design process. Science and technology, in general, have few built-in governance measures. Exploration, as in the arts, continue where discoveries lead. On the other hand, design is customer-driven. Design thinking has to consider constantly how what is being produced can react to the needs of the client (Elsbach and Stiglioni, 2018). McDonagh and Thomas (2010) find that, in our personal lives, the material infrastructure we create and inherit in public settings has a profound effect on our everyday experiences. We impact our productivity, our sense of health, and our sense of social connection through them. Products that provide a positive user experience will motivate people and help build a healthy environment. Products which do not meet the functional or emotional needs of the product can erode a person's sense of independence. Therefore, the design of the product can have profound impact on consumers which can beyond the envisaged effect.

2.13.7. User involvement

Business excellence as a concept is not the responsibility of an employee or unit or section. Instead, it is the responsibility of all people at all levels of the organization to understand the requirements of excellence and pursue their work in an excellent way. Involvement of people is the core of excellence. Design thinking methodology also seeks users' involvement to design a product that will meet the users' desires and needs. For business managers, the customer satisfaction is one of the foremost goals of any business strategy and it will form a key consideration to judge the success of the implementation of the business excellence framework as well. Many branches of design practice and philosophy have concentrated resources in explaining the value of positioning end-users and stakeholders at the centre of design (Rittel & Webber, 1973; Norman, 1988; Squires & Byrne, 2002; Krippendorff, 2006).

In the current practice of design based upon experience, designers are researching and learning from the views and behaviours of end users and stakeholders as they continue to express and attempt to solve design problems (Beckman & Barry, 2007; Von Thienen *et al.*, 2018). The role of the designer in the domain of collaborative design often includes initiating discussions with stakeholders so that they can pursue design themselves (Emmitt & Ruikar, 2013). Requests for a user-centred design or human-centred design often place the designer in the spotlight as the builder of the design process as they provide all the specifics of the design outputs (Krippendorff, 2006). However, if we take the efforts of anthropology and sociology to understand what people do seriously, particularly once the systematic design process is over and people participate in the on-site products and services, then it is necessary to consider the role that end users and other stakeholders play in shaping the nature and effects of design through action (Smith & Iversen, 2018). Therefore, the end users and other stakeholders can be considered co-designers as they

participate in their interactions with artifacts (Kimbell, 2011).

2.13.8. Prototype usage

Business excellence needs to be planned well or prototyped for achieving a higher degree of success and positive results that are identified clearly from the beginning and measured throughout the plan period to ensure their continued achievement. Such continued improvements will enhance the effectiveness and efficiency of the organization by identifying the areas for improvements and taking the required actions to utilize it. Design thinking methodology also emphasizes the process of experimentation and prototyping process in order to identify the opportunities of improvement (Sudsomboon, 2018).

2.13.9. Test

In order to be successful in reaching an outstanding result and sustaining it, business excellence plans always need to be tested by internal and external assessments with proper tools that are included in any excellence model such as EFQM, Baldrige and DGEP, or any other. This assessment is needed to ensure the effectiveness, efficiency, and continuous learning and development of the organization. Design thinking methodology also applies testing to the stage of assessing the quality of designed products for their approval (Stackowiak & Kelly, 2020). By incorporating the attributes of testing and frequent monitoring in the business excellence implementation, managers can improve the outcomes.

2.13.10. Experimentation

Any business excellence model needs to be experimented to ensure its effectiveness in achieving the desired objectives. The practice of experimentation is always implemented in certain organizations or divisions before generalization to all projects and functions. Business excellence experimentation allows the insertion of excellence within the working culture and its accurate

identification. Design thinking methodology also applies experimentation to test the accuracy of the designed products and ensure their quality (Patel & Mehta, 2017).

2.13.11. Need for Resources

Insertion of business excellence within the working culture consumes a variety of resources such as human resources, technology, funding and others. Design thinking methodology also needs resources such as funding, human resources, technologies, expertise, tools, and others to accomplish the projects (McDonagh & Thomas, 2010; Micheli *et al.*, 2019). Adequate planning and organizing of resources are, therefore, an important aspect that needs to be incorporated in the implemented business excellence.

2.14. Study variables

For this study, it is believed that the key variables of attitude, knowledge, and actions impact the design thinking which then affects the implementation outcomes. These variables are assessed here to understand the existing scholarly literature about their concept and its effects.

2.14.1. Attitude

Attitude is the mental position of an individual or a group of people belonging to a public sector organization towards the implementation of the business excellence requirements. Specifically, this attitude may manifest in the willingness to perform the requirements (Andersen & Jessen, 2007). For the implementation of business excellence model, the attitude of employees towards performing the implementation requirements may positively or negatively affect the implementation's expected outcomes. Therefore, understanding the attitude of employees at all levels towards business excellence in addition to the root causes that shape their attitude and influence their behaviour can be beneficial in improving the outcomes.

Haffer and Haffer (2015) have mentioned that the main factors affecting the success of the

businesses analysed by them relate to the individuals and their satisfaction. At the same time, they are the most important factors for enhancing market performance. Furthermore, Breaz (2019) has indicated that the attitude towards a subject influences the attitude of the human beings to agree or disagree with the situation. Measuring the attitude can thus, help to avoid any of the wrong perceptions and beliefs to correct the situation. The author also finds that, among the several different factors evaluated that are conducive to the productive realization of projects, the most significant ones are those referring to people, in particular, their dedication.

Some people see business excellence as a strategic model while others consider it to be an operational tool for the organization (Amponsah & Ahmed, 2017). Consequently, an organization's attitude towards business excellence can manifest its leaders and managers' strong commitment for the continual improvement of all main processes, innovation, and creativity, working conditions, team cohesion, level of engagement, and overall organizational culture (Aladwan & Forrester, 2016). For employees, a positive attitude can manifest in business excellence beginning with their dedication to produce results without revision, readiness to take accountability, continual learning, progress, and clarity in everything they do.

Furthermore, an organization's success depends on the employees' expertise, abilities, ingenuity, and motivation. In fact, this combined human ability is best expressed through shared ideals underpinned by a culture of trust and support (Zdrilić & Dulčić, 2016). One of the identified features of design thinking, innovation, is manifested through transformational leadership which builds positive attitudes towards innovation (Sangperm & Chienwattanasook, 2019). In another study, one of the success factors identified for business excellence among organizations located in Japan, Singapore, China, India and Thailand, a positive attitude which displays maturity in the usage of business excellence tools and techniques was highlighted (Tickle, Mann & Adebajo,

2016). Finally, design thinking also benefits from positive employee attitude who are found to be more willing and motivated to think out of the box and holistically (Elsbach & Stigliani, 2018).

In fact, the five critical steps involved in the implementation of design thinking from empathy to testing have also been associated with the need for positive and enabling employee attitudes. Studies show that employees need to remain positive about the meaning of BE for the firm, clear about its requirements and have the utmost support of their leadership (Andersen & Jessen, 2007; Lasrado & Gomiscek, 2017; Santos *et al.*, 2018). These factors can make them more empathetic to the need for Business Excellence in the organization, define it clearly, ideate for proper implementation, develop prototypes, and test them. Development of prototypes and testing needs trust in the organizational culture and support of the top leaders so that knowledge sharing and risk taking are not sacrificed (Tickle, Mann & Adebajo, 2016; Elsbach & Stigliani, 2018; Bouranta, 2020).

As a result, several studies reflect the importance of the employees' attitude towards business excellence implementation and their willing to perform and implement the requirements. Consequently, this research expects that the difference between the employees' attitude towards business excellence makes a significant difference in the organizational rewards and outcomes achieved by them because of their adoption of business excellence models.

2.14.2. Knowledge

It is a key issue for any company operating in a highly competitive and globalized world to achieve business excellence and optimize the use of organizational assets. Despite this, organizations often ignore or underestimate the role people may play in boosting results with other factors given precedence which contribute to a negative performance because of people mismanagement (Roberts *et al.*, 2016). Knowledge management and knowledge sharing are critical bywords in the

management of human capital which lend competitive advantage and improve productivity, innovation, and survival of an organization (Obeidat, Al-Suradi and Tarhini, 2016; Bolisani & Bratianu, 2018). Both Peter Drucker and Deming have also emphasized the need to invest in employees, develop their knowledge and abilities, and thus, reap the benefits of effectiveness and efficiency of the organization.

Knowledge in the context of this study is defined as the knowledge of the requirements of business excellence implementation, as well as an understanding of the whole picture with the ability to perform different requirements. Employee knowledge, therefore, may affect the implementation's expected outcomes as employees are better informed and more aware about the business excellence requirements. Therefore, by measuring and understanding the level of knowledge of employees about business excellence and its root causes can help managers improve the business excellence implementation outcomes (Gong, Zhou & Chang, 2013). Similarly, employee awareness of the tenets of design thinking can help them to develop good behavioural habits which help in implementing design thinking (Bertolotti, Di Norcia & Vignoli, 2018).

It is first important to understand how knowledge and its management affects organizational outcomes. Pfeffer's research (1994) explains how workers' skills and training can be used to gain a competitive advantage. He suggested that a company can gain a competitive advantage by investing in its workers and treating them as their most valuable assets (Pfeffer, 1994). Human capital can be the present value of all future wages earned by an individual investor, the most valuable asset owned by an individual, and the best defence against inflation (Igbalajobi, 2015). Studies have also suggested that intellectual capital has a significant influence on the organizational performance (Hashim, Osman & Alhabshi, 2015; Mardani *et al.*, 2018). In fact, both human capital investment and employment contributes to a rise in economic growth (Maitra,

2016). Additionally, Baron and Armstrong (2007, p. 5) have mentioned that the skills and expertise of a worker generate a certain stock of productive capital, derived from schooling, experience, and training. An organization can then use this to achieve positive results and improve performance. Nonetheless, the return that human capital investments produce is often intangible but still impacts factors such as customer loyalty, creativity, and service delivery (Kryscynski, Coff & Campbell, 2020). This intangible nature makes it hard to calculate exactly how successful the initial investment has been. This is because human resource is tacit, perspective-dependent, and reflected within the investment receiving person (Baron & Armstrong, 2007). Therefore, because the benefits of investing in human capital are unclear or not easily observable, many companies are neglecting the need to invest in their human capital, mistaking a lack of evidence of positive effects as proof of no results.

The advantages, however, are inherent in business performance, improving employee awareness, increasing and optimizing their abilities, capacity and willingness to grow, and evolve (Shahi, 2017). In the end, this increases an organization's profitability, quality, and output. Good workplace management and expertise will contribute to a competitive advantage, exposure to new markets, creativity, and additional wealth generation (Baron & Armstrong, 2007). Although the initial investment will generate some cost, as Adam Smith wrote, the cost will eventually be offset by the potential increased income that the company and/or the investor will earn (Smith, 1987). Organizations have to invest in knowledge management to better improve their staff and ensure that any expertise or information that their workers possess is shared, preserved, and not lost when workers leave the company (Roberts, 2014). Organizations, therefore, need to develop and strengthen human thinking and action in their workplace if they are to strengthen and achieve business excellence.

Several studies have shown how knowledge brings creativity, sustained growth, and competitive advantage, enhancing the efficiency, competitiveness, and profitability of an organization (Alraouf, 2016; Cohendet, Parmentier & Simon, 2017). For an organization, its knowledge management is closely linked to its service, efficiency, innovation and creativity (Mardani *et al.*, 2018). Knowledge possessed by the organization and its staff is the organization's heartbeat and a potential that can be manipulated and used to establish a competitive advantage provided a diagnosis is performed and the existing knowledge of the staff is recognized and developed (Webb, 2017). From the insights gleaned through these studies, it can, therefore, be concluded that it is the information that a worker possesses, creates, and shares that makes them so valuable for an organization.

From the perspective of design thinking also, knowledge is a critical component in all phases of empathy, definition, ideation, prototype creation, and testing. At every phase, it is presence of clear understanding of what needs to be done and how it can be improved that can make it possible to achieve excellence. Beginning with the establishment of clear guidelines of what business excellence implies for the organization, what expectations exist for performance levels, and the sharing of success stories, leaders can make sure that there is clear empathy and definition of knowledge (Gloet & Samson, 2017; Muthuveloo, Shanmugam & Teoh, 2017; Ghobakhloo & Azar, 2018; Santos *et al.*, 2018). In the same vein, leaders can encourage knowledge sharing to facilitate continuous improvement in the organization through ideation, prototype creation, and testing (Androniceanu, 2017; Lasrado & Gomiscek, 2017; Jaeger, 2018; Santos *et al.*, 2018). As a result, knowledge is critical for both business excellence and design thinking.

2.14.3. Actions

The actions taken to fulfil the requirements of the business excellence model and implement it at different levels of a public sector organization from the leadership level and management level facilitate the actual performing of the requirements. For the implementation of the business excellence model, the actions that the employees are willing and able to perform related to the business excellence implementation requirements will affect the implementation's expected outcomes. Therefore, understanding the actual implementation requirements and motivating employees at all levels towards clear objectives within an agreed action plan may affect the outcomes of business excellence implementation.

An essential topic for any organization is the question of motivating a worker effectively. By motivating employees, an organization can garner some level of control over their actions and ensure that they are aligned to the organizational goals and strategies (Colvin & Boswell, 2007). Furthermore, using a carefully planned performance and reward management policy can facilitate the organization in this endeavour by making it possible to improve its earlier performance (Armstrong & Taylor, 2020). This is accomplished by finding out what level of success is needed, what incentives will be introduced to achieve such goals by developing a knowledge flow that enables the organization to evaluate progress, and uses lessons learned earlier through effective knowledge management. A strong performance management program gives individuals the flexibility to accomplish their goals using relationships of cause and effect (Abubakar *et al.*, 2019). This makes the individuals more motivated and active in setting targets, providing a framework for dialogue, and quality improvement, thus, improving the likelihood of positive attitudes. These factors ensure that workers are interested in setting targets, provided incentives to develop and advance in areas that need improvement, offered collective compensation initiatives, and obtained

input from well-trained staff (Stoyanova & Iliev, 2017; EFQM, 2020). Employee actions are also influenced by business and economic trends which are also related to altruistic results which take care of the society and environment (Jabnoun, 2019). In this way, employee actions can act as a bridge between design thinking and business excellence implementation. Leadership behaviours are another important variable that ensure the employees participate in the organizational practices and are committed to continuous improvement (Jabnoun, 2019).

Actions find an important role in business excellence and design thinking. At the empathy stage, organizations need to ensure that they have a strategy in place to implement the right actions for meeting their business excellence objectives (Androniceanu, 2017; Lasrado, 2018). Furthermore, policies need to be put in place to make sure that there is clarity and uniformity in the implementation of actions (Lasrado & Gomiscek, 2017; Nizamidou & Vouzas, 2020). At the definition stage, organizational structure should help define the actions and their implementation (Jabnoun, 2019; Kassem *et al.*, 2019) while IT systems help support it (Androniceanu, 2017; Lasrado & Gomiscek, 2017; Santos *et al.*, 2018; Kassem *et al.*, 2019).

Furthermore, ideation is made possible through organizational policies that encourage it (Lasrado & Gomiscek, 2017; Nizamidou & Vouzas, 2020) while making such practices a part of the daily work ensures that outcomes are realized (Stoyanova & Iliev, 2017). Prototypes are developed by eliciting the feedback from the stakeholders and making this action a part of the organizational culture (Ferdowsian, 2016; Kassem *et al.*, 2019). Furthermore, introducing reward systems that help cement effective actions make the implementation outcomes more likely (Armstrong & Taylor, 2020). The last stage of testing is made possible through a steering committee which overlooks its implementation (Tickle, Mann & Adebajo, 2016; Adamek, 2018). Lastly, the leaders and employees work together to take those actions which can implement the desired and

needed actions (Abubakar *et al.*, 2019).

As has been established in TQM and business excellence models, continuous improvement through incremental changes is essential and these can only be brought about by the employees, the importance of focusing on employee actions cannot be stressed enough. Therefore, not only are knowledge, attitude, and actions connected to business excellence requirements, there is a possible relationship between them which is assessed in this study.

2.15. Summary

The literature review presented in this chapter has delved in great detail in the existing understanding of business excellence and its models prescribed for improving the outcomes of business organizations. It has further explained the link between design thinking, its attributes, and their likely relationship with the implementation of the business excellence framework. The following figure describes the conceptual framework of this study.

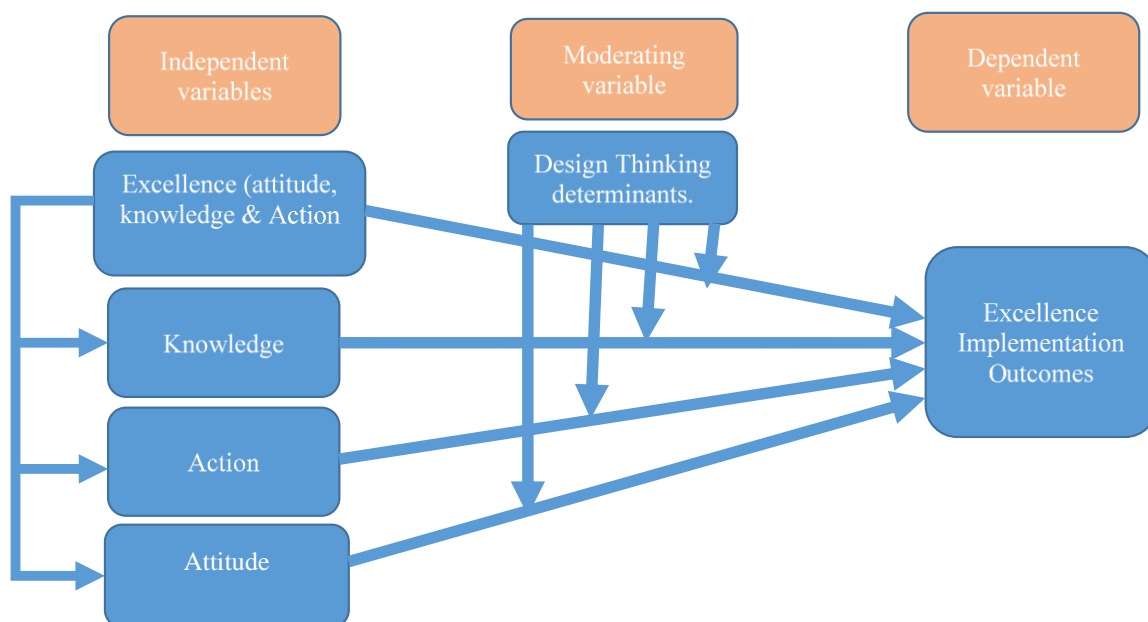


Figure 2. 9 Research conceptual framework

As has been identified, the variables of attitude, knowledge, and actions can affect the guiding framework of design thinking which, in turn, moderates the implementation outcomes of business excellence. This is the relationship intended to be measured by this study and which is later explained through hypotheses.

Based on the literature review conducted in this chapter, the next chapter proposes a relationship between the research variables that are illustrated in a conceptual framework and introduce the hypotheses which examine the research questions.

3. Chapter Three: Research Methodology

The last chapter discussed the concept of business excellence at length describing the prevalent models which have been suggested by Deming, Malcom Bridge, and the European Framework. These models have recently been amended to make them better suited to organizational requirements and changing environmental conditions. The chapter also detailed the similarities between business excellence and design thinking ranging from a human-centred focus to strategic focus, innovation approach, altruism, collaboration, usage of technology, user involvement, prototype usage, test, experimentation, and need for resources. Moreover, the key independent variables included in this study attitude, knowledge, and actions are also described in detail with existing studies which have explored them.

In this chapter, the research design, methodology, and methods adopted to investigate the influence of design thinking determinants on business excellence outcomes in the public sector to achieve the research objectives are discussed at length. The way the research should be conducted is described by the research methodology including the theoretical background, the assumptions based on which the research is built, and its inferences on the adoption of the research methods (Saunders *et al.*, 2015, p. 481). The methodology focuses on the overall process of research starting from the introduction of the key concepts, the literature review and theoretical background, to the choices of the right research structure and sampling, data collection, and the proper analyses and discussion of the collected data to conclude the research (Gray, 2019). Thus, choosing the best suited methodology based on the nature of the research objectives and questions is critical for a researcher to determine the design and strategy of the research and hence, achieve the objectives. The study utilizes a quantitative research design to examine the relationship between the dependent variables of business excellence outcomes and the independent attitude, knowledge, action and

excellence variables with the moderating variable of design thinking on excellence implementation outcomes. This relationship is examined using the structural equation modelling SEM technique.

3.1. Research Design

The research design for this study is exploratory. The exploratory nature of the design is so as the link between design thinking and business excellence has not yet been explored and it is expected that knowledge, attitude, and actions of managers have a good potential to act as independent variables. The underlying research approach is pragmatic as the intention is to apply a quantitative methodology to gather objective, observable, and verifiable data which can help decision-makers to amend their organizational practices. The research proceeds with the description of hypotheses which have helped the researcher to assess the relationship between the independent, moderating, and dependent variables. Keeping in with the positivist research philosophy, a deductive approach is employed to compare the results of the study and its hypotheses with the emerging findings. Using a cross-sectional survey, the study has conducted a questionnaire survey and assessed its collected data using SEM to understand if attitude, knowledge, and actions really do affect business excellence outcomes and if this relationship is moderated by design thinking determinants.

The overall research process is depicted in the following figure (Saunders *et al.*, 2015; Gray, 2019):

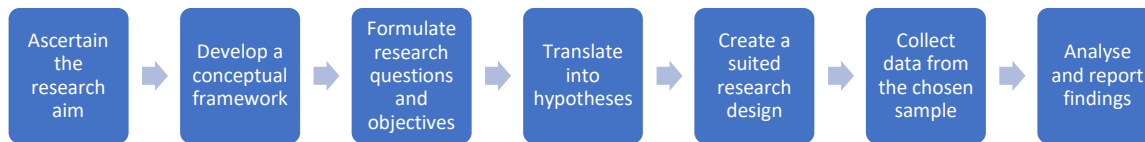


Figure 3. 1 Overall Research Process

At each step of this process, the research chose those alternatives that suited the needs of the research and its context best. For instance, the research hypotheses were developed from the research questions and objectives which were found to be best answered through a questionnaire survey. A suitable population of senior managers was identified for the population while SEM analysis was chosen for data analysis.

3.2. Research Paradigm

The research paradigm of a study establishes the assumptions, constructs, and research values which guide the researcher throughout the duration of the study (Gray, 2019). The meaning associated with a research phenomenon is derived from the way people react to it. This reaction is dependent on earlier knowledge, assumptions, and beliefs of the actors. For instance, in this research a subjectivist epistemology would have enquired deeper into the responses of each senior

manager taking into consideration their earlier perspectives with respect to business excellence, their opinion of design thinking, and their preferred way of managing and leading their employees. However, this research has adopted an objectivist epistemology with a realist ontology as they suit the quantitative research design where several senior managers' opinions about business excellence and design thinking and their relation to the outcomes can be ascertained. With this research aim, the researcher believes that there is one reality of a relation between business excellence and design thinking that needs to be identified.

The researcher is aware that an objective epistemology is not considered to be reflective of social sciences research. The post-modernist and post-structural thought in research has completely disregarded the use of objectivist paradigms as being too far removed from reality (Kapitzke, 2003). The assumptions of being value-neutral, unaffected by the research process, and of maintaining an objective stance throughout data acquisition have all been challenged. Social and historical genesis and context of information all affect how knowledge is perceived, collected, and analysed. For this purpose, Kapitzke (2003) has suggested the use of a concept of hyperliteracy which acknowledges and heeds the various forms of data available currently and makes plans to include them in the study.

This concept will also acknowledge the various environmental factors that operate within the research context and which influence and are influenced by the research phenomenon. Including hyperliteracy in a research is, however, a challenging phenomenon as an exhaustive list of all influential factors is not possible for a social scientist nor is it possible to study their nature except in case studies involving grounded theory. Even in such cases, the knowledge is captured for only a few cases if not one and the research remains limited by the time when the data is collected.

Research paradigm is also directly related to the research philosophy of whether positivist, interpretivist, realist, or pragmatic philosophies which are discussed in detail in the next section.

3.3. Research philosophy

Research philosophy describes the researcher's ontological assumptions of what knowledge already exists in the research context. Thomas Kuhn was the first to raise the concept of a research paradigm in the early 1960's indicating that it is the "*people's value judgements, norms, standards, frames of reference, perspectives, ideologies, myths, theories, and approved procedures that govern their thinking and action*" (Bird, 2014, p. 153). In short, the research paradigm shows the researcher's preferred way of planning for expansion of knowledge in the area of study.

There are four possible research philosophies. The first is positivism which suits quantitative studies which are highly structured, use a large sample size to find insights which can be generalizable to similar populations (Pogosyan, 2018). This is reminiscent of the present research which is attempting to apply the business excellence theory and design thinking determinants which have been found established in other contexts to Dubai's public sector employees. Using pre-existing theory and applying it to a new context can improve the predictability of some relationships which had already been established earlier. A positivist philosophy is suited to studies that use hypotheses which are created after a thorough literature review and reflects existing knowledge.

The second philosophical approach is interpretivism which is better suited to qualitative research designs which employ a smaller sample of data but aim for a wide range of factors to gather rich details about the data (Gray, 2019). This approach is mainly based on the subjective understanding of the collected information. Using this combination of positivism and interpretivism, two more research philosophies were formulated. The first is realism, which believes that the chosen

methods should fit the subject matter. It is distinguished into direct realism which is based on the human senses and what they perceive and creative realism which involves critiquing the received stimuli (Sekaran & Bougie, 2016). The last research philosophy is of pragmatism which is the guiding philosophy chosen for this study. Pragmatism combines the tenets of positivism and interpretivism to look for practical solutions for future practice. “Pragmatists recognize 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.*, 2015). As the usability of this research is of paramount importance for the researcher, a pragmatist philosophy is preferred over the positivist approach

3.4. Research Approach

The research approach guides the researcher towards the choice of assumptions and methods of data collection and analysis (Creswell & Creswell, 2017). A researcher can choose between three kinds of approaches based on the nature of the relationship of the research with theory (Bell, Bryman & Harley, 2018). The first is the induction approach where the observations and findings of the research leads to a new theory. In the deductive approach, the researcher deduces his study’s hypotheses based on existing theory, cascading it into operative terms and examines them in practical terms by using statistical devices which help to accept or reject them (Sloan & Quan-Haase, 2017). In the process, the researcher arrives at new facts that further improve the quality of existing theory.

The deductive approach moves from the general and wider theories to the specific and closer examination of the research requirements. In the inductive approach, the movement is from the specific observation to the general theory. The last approach is the abductive approach which addresses the weaknesses of both deductive approach which is unable to clearly spell out what

theory to select for formulating hypotheses and for the inductive approach which is criticized as no amount of empirical data from a single study can be considered enough evidence to develop a theory in its own right (Tavory & Timmermans, 2019).

The researcher needs to choose among the three approaches based on key criteria suggested by Creswell and Creswell (2017). These criteria include the research topic and its nature, the availability of time with the researcher, and the level of risk that the researcher can take. Based on reflection on these criteria and the benefits of the abductive approach, the researcher has chosen it for guiding this study.

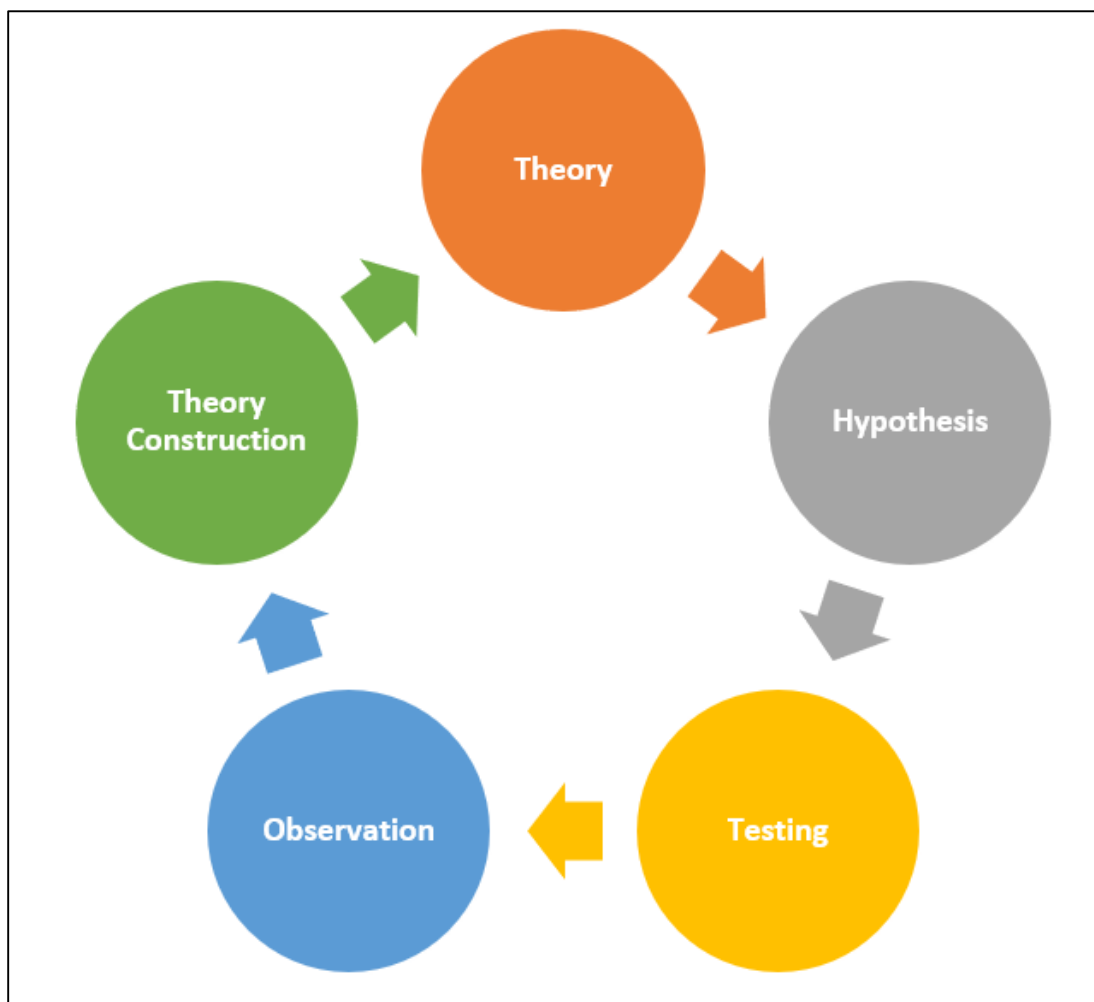


Figure 3. 2 Wheel of Science for Abductive Approach

The wheel of science shown in Figure 3.2 clarifies the process of abductive approach. The existing theory has helped create a conceptual framework and hypotheses which are tested through the data collection. The results are observed to identify insights which are then used for theory construction. By indicating the potential role of design thinking in improving the business excellence implementation outcomes, this study yields insights for further construction of existing theory of business excellence.

3.5. Conceptual framework and study hypotheses

The conceptual framework of the research is needed to develop measurable hypotheses regarding business excellence implementation outcomes. The literature review has provided more insight into the study variables and suggested possible relationships between them. It is believed that knowledge, attitude, and actions have an impact on the success of business excellence. Furthermore, design thinking and its determinants has several similarities and affinity with business excellence suggesting that it is a moderator for more effective implementation outcomes. The research conceptual framework presented in figure 2.9 depicts this relationship with knowledge, attitude, and actions all showing a relationship with business excellence while design thinking showing a good potential to act as a moderator. Figure 3.3 below illustrates the hypotheses in the theoretical framework:

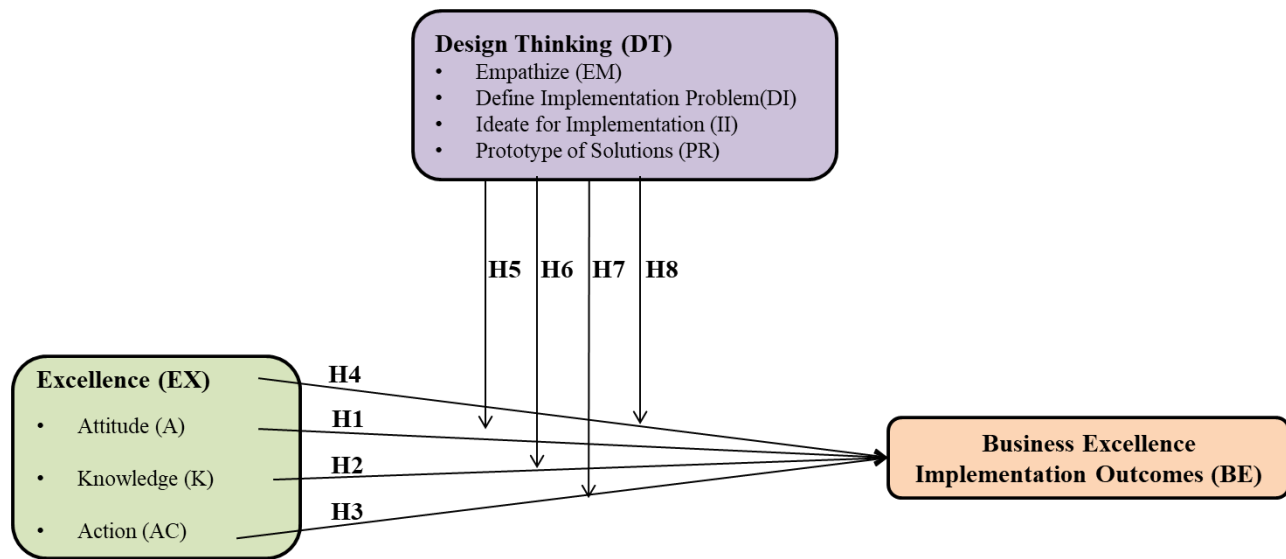


Figure 3.3: Theoretical Framework

The first three hypotheses examine the relationship between attitude, knowledge, and actions with business excellence implementation outcomes directly without considering the moderating variable of design thinking determinants. Hypothesis 4 considers the combined effect of all three independent variables on BE implementation outcomes. Hypotheses 5 to 8 repeat this exploration but with the presence of the moderating variable. The two sets of hypotheses make it possible to compare the impact on BE outcomes from design thinking determinants.

3.6. The relationship between attitude and business excellence outcomes

Attitude: An attitude is the mental position of an individual or a group of people from the public sector organization toward the implementation of business excellence requirements by affecting how amenable they are to perform the requirements of the BE model (Haffer & Haffer, 2015).

The measures employed to assess employee attitude are described in relation to the implementation of business excellence as shown in table 3.1 attached to the appendix.

There are eight items in the attitude scale which enquire about the respondents' perspective of business excellence. The first one measures whether the employees have a positive outlook of

business excellence implementation. This item was derived from the belief that employees should believe in business excellence implementation for it to be a success (Tickle, Mann & Adebajo, 2016). The second item measured how proud the employees felt about their organization's implementation of business excellence. This feeling of pride was derived from the work of Santos *et al.* (2018). The third item in this scale was reverse coded for excellence requirements are being not an additional workload for employees for which ample indications were available in the works of some researchers (Lasrado & Gomiscek, 2017; Snyder, Eriksson & Raharjo, 2020).

Excellence implementation requirements are embedded in the daily tasks of the employees which was the fourth item in the attitude scale was inspired by the works of researchers who assert that positive attitudes with business excellence requirements embedded in daily tasks and a committed leadership make ideation for implementation easier (Lasrado & Gomiscek, 2017; Escrig-Tena, Garcia-Juan & Segarra-Ciprés, 2019). Positive employees who do not consider business excellence to be an encumbrance and are provided an enabling culture are more likely to be clear about its requirements.

Item 5 was again reverse coded and asked if the organization's employees find it meaningful to win awards (Lasrado & Gomiscek, 2017; Santos *et al.*, 2018). Reviews are made possible by employee support for improvements and implementation in the next cycle of business excellence and is possible when employees support the identification of improvements. The employees should remain positive about business excellence requirements for the next cycle.

This statement is connected to the others as winning awards makes employees feel pride in the business excellence, find achievement of goals to be meaningful, and have a committed leadership who can develop empathy and make employees more willing to implement business excellence. The commitment of the leadership was the next statement as well which has obvious connections

to the employees' positive attitudes towards business excellence (Krajcsák, 2019; Sternad, Krenn & Schmid, 2019). It was also the connection with the next item of the perception of leaders in the organization support in creating an excellence culture (Krajcsák, 2019; Sternad, Krenn and Schmid, 2019). It is important that leaders encourage changes and support a stimulating, knowledge-sharing culture.

The last item in the scale asked about the level of comfort in taking risks associated with excellence implementation in the organization (Andersen & Jessen, 2007). This is an important measure as the organizations can proceed with implementation only when they are willing to take risks and share knowledge.

3.7. The relationship between knowledge and business excellence outcomes

The Knowledge variable in this study signifies the knowledge of the requirements of business excellence implementation, as well as, an understanding of the whole picture with the ability to perform different requirements (Andersen & Jessen, 2007). All measures indicated in the Table 3.2 attached to the appendix were operationalized through eight items to understand the respondents' opinion of knowledge for business excellence implementation. Excellence requirements are not an additional workload and are a part of routine work knowledge. These items indicate that the human capital recognizes the need for knowledge and appreciates it and can define and understand the issues in business excellence implementation (Muthuveloo, Shanmugam & Teoh, 2017; Ghobakhloo & Azar, 2018). Further items are enquired if the excellence implementation outcomes are clearly identified in the organization. This measure was identified in the works of researchers who stressed on the importance of clarity and uniformity in the understanding of business excellence (Obeidat, Al-Suradi & Tarhini, 2016; Bolisani & Bratianu, 2018). This was also stressed through the perception of leadership where item four asked if the

leaders have a good understanding of the difficulties facing excellence implementation. Unless leaders are onboard and on the same page with business excellence implementation, realising business excellence is a difficult proposition (Bouranta, 2020).

The next item enquired if employees have clearly understood the link between their work practices and the organization's objectives related to excellence. This measure assessed if the employees are able to realise the organizational objectives in a manner consistent with achieving the business excellence (Andersen & Jessen, 2007; Elsbach & Stigliani, 2018). A related step for achieving the said goals is whether employees receive the training needed for excellence implementation which was also the subject of the next item. The ultimate aim is that the human capital should be able to build upon existing knowledge (Lasrado & Gomiscek, 2017; Jaeger, 2018; Santos *et al.*, 2018). Furthermore, the achievement of business excellence implementation is possible only when the right capabilities are present to implement excellence requirements. Unless employees have the right skills and knowledge, they are unlikely to be able to bear the burden of the added responsibilities which come with doing their jobs well (Androniceanu, 2017; Lasrado & Gomiscek, 2017; Carvalho *et al.*, 2019). This item also reflects on how well the employees can create prototypes for achieving business excellence outcomes.

The next ingredient to make this recipe a success is an enabling organizational culture. This was captured through the item seven which enquired if there is a mutual understanding of excellence implementation requirements across all levels. This item was derived from the work of some researchers who had attended to these factors in their work (Androniceanu, 2017; Lasrado & Gomiscek, 2017). Leaders and employees are onboard to make changes in the existing knowledge framework.

3.8. The relationship between action and business excellence outcomes

Actions in the context of this study signifies all actions taken to fulfil the requirements of business excellence implementation at different levels of a public sector organization (leadership level, management level, and nonsupervisory level) (Andersen & Jessen, 2007).

The measures that were identified from the literature review and operationalized in the questionnaire items have been listed in Table 3.3, which is attached to the appendix. The first item out of the eight in the Actions scale enquired if the Stakeholder feedback is part of the respondents' organization culture in business excellence implementation. Such seeking of stakeholder feedback is becoming the norm in strong employer brands like in the case of Marks and Spencer who conduct stakeholder engagement of hundreds of suppliers, customers, and other agencies as part of their sustainable strategy of Plan A (Marks & Spencer, 2021). This stakeholder feedback has also resonated in the works of several researchers who believe that leaders should listen to the stakeholders (Ferdowsian, 2016; Kassem *et al.*, 2019). A supportive work environment was again highlighted by the next item which enquired if the organization's policies support employees in achieving excellence objectives. Support from the organization is critical for the employees to meet their objectives and find motivation for performing their tasks (Lasrado & Gomiscek, 2017; Nizamidou & Vouzas, 2020). Policies clarify the idea of actions while they are manifested in the daily practices of employees.

The third item asked if in the organization the decisions are taken at strategic level to fulfil business excellence requirements. Unless business excellence becomes a part of the business strategy, it is not possible for the employees to take positive actions in their daily work environment for implementing it. Strategic direction and policies are needed to clarify what steps are needed to operationalize the existing knowledge and attitudes for business excellence (Androniceanu, 2017;

Lasrado, 2018). The actions for excellence implementation being a part of daily work is, hence, the next item in the scale. It is important for organizations that employees' actions are manifested in their daily operations (Stoyanova & Iliev, 2017).

Item five enquired whether in the organization, the IT systems support business excellence implementation. IT has become synonymous with most jobs, especially, since the remote working has become the norm during the coronavirus pandemic. Business excellence needs coordination and collaboration which are enabled by the responsiveness and timeliness of IT systems (Androniceanu, 2017; Lasrado & Gomiscek, 2017; Santos *et al.*, 2018; Kassem *et al.*, 2019). The next item enquired if the organizational structure is designed to support business excellence implementation. The organizational structure and systems should support the actions needed to implement business excellence (Jabnoun, 2019; Kassem *et al.*, 2019).

With a supportive environment and processes in place, item 7 revolved around the availability of a rewarding scheme for business excellence implementation. When leaders establish systems that identify good actions and are recognised to be rewarded for the same, then these actions become habitual (Armstrong & Taylor, 2020). The last item enquired whether the organization possessed a steering committee for guiding the implementation of business excellence. Prototypes are tested through the direction of a steering committee which ensure that human capital works together to implement actions. As a result, steering committees are recommended by researchers (Tickle, Mann & Adebajo, 2016; Adamek, 2018).

As in the case of knowledge and attitude, actions are also important to implement business excellence in organizations. These measures of the actions are included in the questionnaire items to elicit the respondents' opinions about their applicability in their organization.

3.9. The relationship between excellence and business excellence outcomes

Excellence is taken as the fourth independent variable which is the compilation of the attitude, knowledge, and action as the three together representing the implementation of business excellence within an organization. This variable was explored through eight items which have been attached to the appendix in Table 3.4. The first item enquired, “if in the organization, the implementation of excellence drives to optimized revenues”. This item connects to the results of higher revenue which, as per the managers, are acquired through the business excellence implementation outcomes. This item was supported by the works of several researchers (Lasrado & Gomiscek, 2017; Woliński & Bala, 2018). The second item posed the question of whether in the organization, the implementation of excellence drives to a pioneering socially responsible practice. Item three was also linked to environmental objectives of the firm as it enquired if the organization believes that the implementation of excellence drives to minimize environmental footprint. Both these items were derived from the works of researchers who have explored the environmental impact of business excellence (Hammad, Dweiri & Ojiako, 2020). Social responsibility was the focus of the next items. The first such objective was enquired in Item four, “in the organization, the implementation of excellence drives to meet the needs of all stakeholders”. Stakeholder engagement is now considered to be a critical outcome for all organizations (Adamek, 2018; Carvalho *et al.*, 2019). Social responsibility also guided the formulation of the next item, “the implementation of excellence drives to optimal utilization of various resources”. This item too was supported by research as communities gain prominence for their role in providing resources (Ghobakhloo & Azar, 2018; Carvalho *et al.*, 2019).

Item six shifted the focus to yet another aspect of organizational outcomes which is customer satisfaction. It posed the query if in the organization, “the implementation of excellence increases

the customer's happiness results". Customer satisfaction is critical to the survival and success of all organizations (Lasrado, 2018; Jabnoun, 2019). Another organizational outcome, which is productivity, was the focus of Item 7, "excellence implementation drives to increase the productivity". This item was supported by several researchers' work with the most prominent ones being mentioned here (Lasrado & Gomiscek, 2017; Woliński & Bala, 2018). The last item explored the level of satisfaction and commitment from the employees as it explored if, "excellence implementation increases the employees' happiness results". Employees, as mentioned above, are important stakeholders in achieving business excellence (Dubai Happiness Meter Annual Report). It is important to assess how well results are able to justify the excellence framework.

3.10. Dependent variable with the moderating variable

To measure the dependent variable of business excellence outcomes with the moderating variable of design thinking and its determinants and the independent variables of attitude, knowledge, actions, and excellence, the variable was operationalized through several measures identified during the literature review. Each of the determinants of design thinking with the items designed to enquire about it and the studies that have supported and guided the inclusion of the particular item are presented in Table 3.5 attached to the appendix.

The first determinant is Empathize where it was necessary to develop empathy with the organizational needs, objectives, strategy, culture, and capabilities before designing and implementing business excellence (Bobrek, Majstorovic & Sokovic, 2006; Beckman & Barry, 2007; Design Council, 2011; Boy, 2017; Bertolotti, Di Norcia and Vignoli, 2018; Chou, 2018; Micheli *et al.*, 2019). The items in this subscale began by enquiring about the employees' involvement, "Employees are actively involved in diverse phases of excellence implementation".

This is necessary as described in the previous sections where the employees have to achieve the goals of the organization and the extra stretch needed for business excellence. The next step was to enquire how well the leaders acted as role models with Item 2, “Leaders are a source of inspiration for identifying the direction of excellence implementation”. The leaders play a critical role in achieving business excellence as they guide the path to its implementation.

Item 3 wondered if the employees were provided the right environment for achieving their goals, “During planning phase for excellence, ample time is dedicated to assess employee needs”. With employees and their leaders critical to the success of business excellence, it is vital that their needs and responsibilities are kept firmly in focus. This is why Item 4 revolved around, “Employee perceptions about excellence implementation are understood by leaders”. Once the needs are identified and the communication begins so that employee perceptions are declared, the last step of Empathize was brought into focus. Item 5 embodied this, “Organization’s leaders are comfortable to see excellence implementation problems from the employees’ point of view”. The focus on employee needs and communication is workable only when the leaders are competent and feel positively about the business excellence implementation.

The second determinant of design thinking is Define which believes that successful implementation of an idea is possible only when it is designed well. The five items which explored this determinant in the questionnaire survey were created using the findings of prominent studies in the field of design thinking (Bobrek, Majstorovic & Sokovic, 2006; Beckman & Barry, 2007; Design Council, 2011; Boy, 2017; Bertolotti, Di Norcia & Vignoli, 2018; Chou, 2018; Micheli *et al.*, 2019). The first item explored if the initial problems related to excellence implementation are reformulated in order to achieve a good result. The ability to adapt to the emerging situation and be flexible enough to make changes is important for the organization and its resilience. The second

item in this subscale asked if the “Organization’s leaders are interested in better understanding the problems related to excellence implementation”. Leaders feature prominently in all studies and discussions of business excellence and their comfort and involvement in meeting its objectives is critical. Item 3 posed the question if the “Organization’s excellence team is capable of reformulating the initial excellence implementation problems statements”. This is an important question which goes beyond the flexibility and resilience of the organizational personnel and asks if they are capable and aware of evolving their learning objectives and committing to constant progress towards their goals. Item 4 was also focussed on this aspect as it enquired if the new opportunities related to excellence implementation are sought by the firm. Finally, item 5 asked if, “Excellence teams seek as much information as possible in defining the problems”. Unless teams deliberate on complete information and all aspects of the problem, their design may lack detail and will not be flexible enough to meet any overlooked aspects.

The third design thinking determinant is Ideation. The questionnaire survey posed five items to explore the competence of respondents’ organizations with respect to their ideation capabilities. Item 1 enquired if leaders prefer new versus familiar solutions for excellence implementation. This item aimed to assess the extent of attention given to innovation in the decision making of the firm. The same aim was also the focus of Item 2 which enquired if the organization seeks new ideas in dealing with unsolved excellence implementation problems and Item 3, “the organization is adopting innovative solutions to enhance its excellence outcomes. Innovation has become one of the more important factors that contribute to organizational resilience, survival, and competitive advantage.

Item 4 enquired if the firm believes in, “Conclusions are built from the analyses of the available information”. As the questionnaire had already asked the respondents if their firms were collecting

all the possible information about a problem in the define stage, this item was posed to understand if that information was properly used in ideation. Item 5 focused on asking if the firm believed in constant learning and moving forward after mistakes. It stated that “learning from failure is a source for generating ideas to solve problems” and was also an indicator for the positive attitude of the firm towards mistakes. Therefore, this subscale believed in assessing how well the employees come together with leaders to reflect, assess, brainstorm, and build alternatives for meeting goals.

The next determinant for design thinking is developing prototypes for solutions. The researcher found this determinant a little challenging to be adopted for all situations where he would like managers to apply business excellence. Nevertheless, he developed five items to explore this factor in detail using the guidance of earlier researchers (Bobrek, Majstorovic & Sokovic, 2006; Beckman & Barry, 2007; Design Council, 2011; Boy, 2017; Bertolotti, Di Norcia & Vignoli, 2018; Chou, 2018; Micheli *et al.*, 2019). Prototypes are small scale, lower risk and magnitude solutions that are employed to check alternatives. They can help in assessing the impact of far-reaching decisions. With this in mind, the first item enquired if in the organization, prototypes are created to represent new ideas for excellence implementation. This item would reflect how well the firm is able to create concrete models of their ideas for implementing excellence.

Item two assessed the experimentation tolerated in the organization by posing if, “Organization experiments with new solutions before implementing them”. Innovation at the ideation stage is not useful unless it is followed by its application at this stage. The next item was focused on the employees’ competence and involvement in design thinking. It stated, “Employees can diagnose when there is a necessity to repeat one phase of the implementation process”. Item four aimed to understand the tolerance of exploring various alternatives for solving a problem at one time. It

enquired if the organization is comfortable to simulate alternative contexts of use of the solution. The last item asked about risk taking ability and preparation of the organization's leaders for identifying and providing for these risks. It asked if risk taking is promoted, even if it leads to mistakes and failure. Therefore, only those firms which are completely committed to innovation and are ready to explore all alternatives despite its risks would proceed to the next steps.

The last determinant of testing was explored through only one item which posed if the solutions are tested and then implemented for maximum impact. New solutions, prototypes, and processes are tested before final launch. This step can improve the understanding of the new context and allow incremental, iterative changes.

3.11. Hypotheses

Based on the relationships and understanding of respective measures, the hypotheses have been created in the following manner. The first hypothesis is drafted as follows:

H1: There is a significant relationship between attitude and business excellence outcomes.

To test the relationship between the independent variable (attitude) and the dependent variable (business excellence outcomes) keeping in mind the insights from the literature review, suited measures were found and modified based on the judgment of the academic experts. Furthermore, hypothesis five also explores the role played by design thinking determinants in influencing the implementation outcomes as per employee attitudes.

H2: There is a significant relationship between knowledge and business excellence outcomes.

H3: There is a significant relationship between actions and business excellence outcomes

To measure the relationship between the independent variable (action) and the dependent variable (business excellence outcomes) with the moderating variable (design thinking and its determinants), Hypothesis 7 was also formulated.

To measure the impact of the combined variable on the business excellence implementation outcomes, the following hypothesis was drafted:

H4: There is a significant relationship between excellence and business excellence outcomes

To measure the relationship between the dependent variable (business excellence outcomes) and independent variable (excellence) with the moderating variable of design thinking and its determinants, the following Hypothesis is drafted:

H5: The relationship between attitude and business excellence outcomes is moderated by design thinking and its determinants.

Similarly, to measure the relationship between the independent variable (knowledge) and the dependent variable (business excellence outcomes) with the moderating variable (design thinking & design thinking determinants), another hypothesis was crafted:

H6: The relationship between knowledge and business excellence outcomes is moderated by design thinking and its determinants.

H7: The relationship between action and business excellence outcomes is moderated by design thinking and its determinants.

H8: The relationship between excellence and business excellence outcomes is moderated by design thinking & design thinking determinants.

Based on the measures identified in the tables 3.1 to 3.5, the final list of hypotheses for this study are shown in Table 3.6 below:

Code	Description	Path
Direct Effect of Constructs		
H1	Attitude (A) has significant effect on Business Excellence Implementation Outcomes (BE)	$A \rightarrow BE$
H2	Knowledge (K) has significant effect on Business Excellence Implementation Outcomes (BE)	$K \rightarrow BE$
H3	Action (AC) has significant effect on Business Excellence Implementation Outcomes (BE)	$AC \rightarrow BE$
H4	Excellence (EX) has significant effect on Business Excellence Implementation Outcomes (BE)	$EX \rightarrow BE$
Moderation Effects of Design Thinking (DT)		
H5	Design Thinking (DT) moderates the relationship between Attitude (A) and Business Excellence Implementation Outcomes (BE)	$DT * A \rightarrow BE$
H6	Design Thinking (DT) moderates the relationship between Knowledge (K) and Business Excellence Implementation Outcomes (BE)	$DT * K \rightarrow BE$
H7	Design Thinking (DT) moderates the relationship between Action (AC) and Business Excellence Implementation Outcomes (BE)	$DT * AC \rightarrow BE$
H8	Design Thinking (DT) moderates the relationship between Excellence (EX) and Business Excellence Implementation Outcomes (BE)	$DT * EX \rightarrow BE$

Table 3. 1 Research Hypotheses Codes and Descriptions

Using these Hypotheses, the amended framework from figure 2.9 is now depicted in figure 3.3 as illustrated before.

3.12. Research Models

In order to specify the research hypotheses targeted in Table 3.1 and Figure 3.3, two research models were developed in this study. The first research model is intended to test a direct effect hypothesis related to the effect of Excellence (EX) on Business Excellence Implementation Outcomes (BE). This hypothesis was coded as H4. The moderation effect of Design Thinking (DT) on this relationship was also examined. The related hypothesis to this moderation effect is H8. Figure 3.4 illustrates the hypotheses in the second research model and their relative paths.

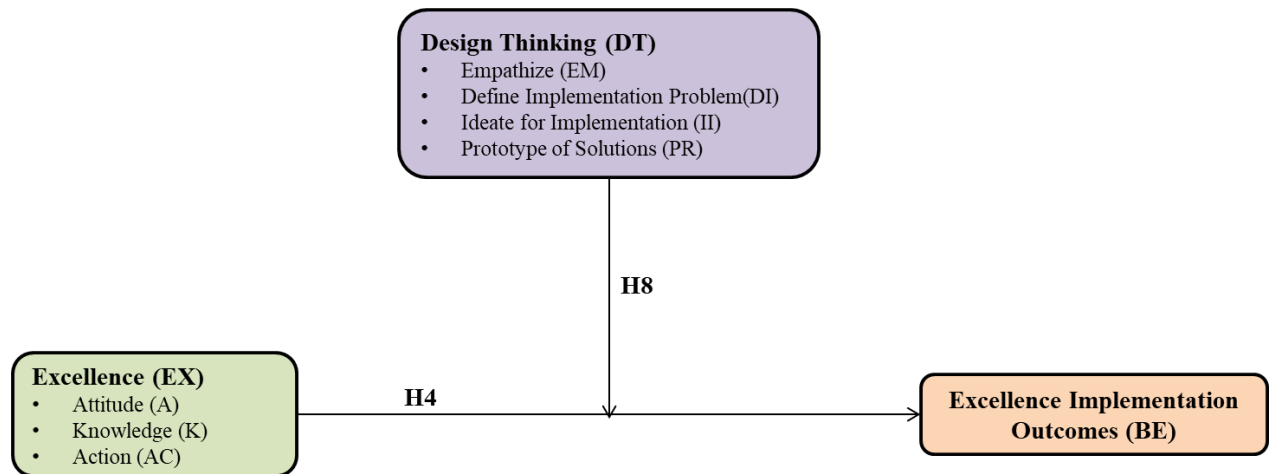


Figure 3. 3 Research Hypotheses in Research Model 1

The second research model is intended to test the relationships between Attitude (A), Knowledge (K) and Action (AC) with Excellence Implementation Outcomes (BE). The hypotheses related to these paths are H1, H2, and H3, respectively. Furthermore, the moderation effects of Design Thinking (DT) on these relationships were examined. The related hypotheses to these moderation effects are H5, H6, and H7.

Figure 3.5 illustrates the hypotheses in the second research model and their relative paths.

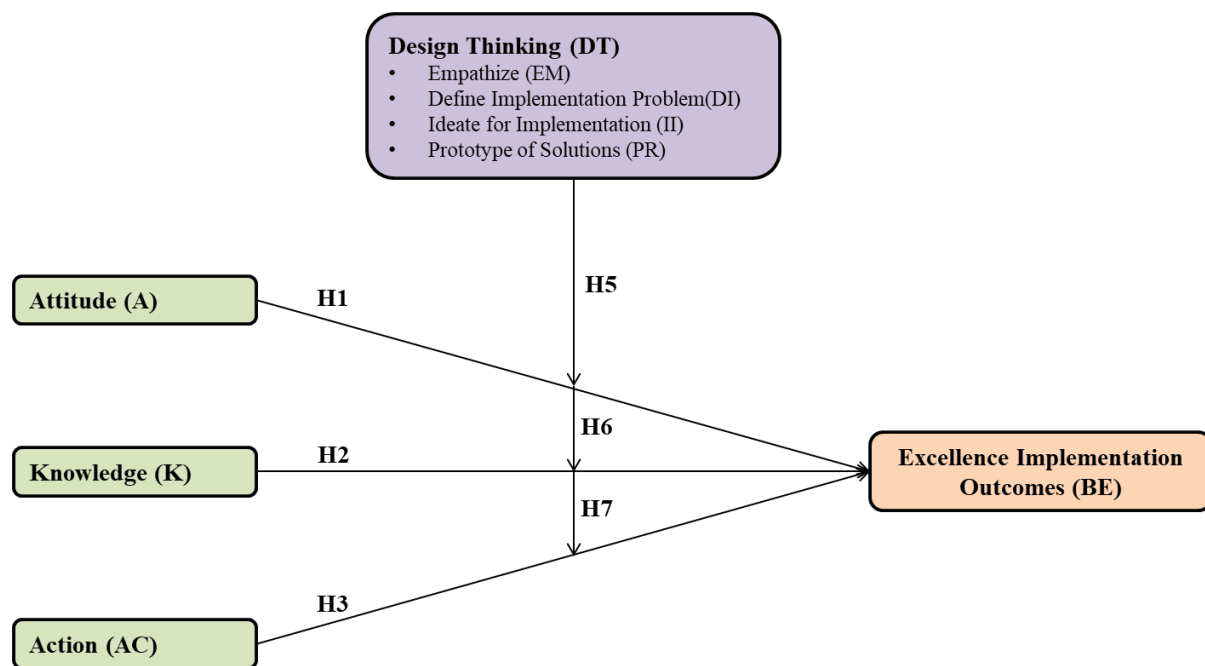


Figure 3. 4 Research Hypotheses in Research Model 2

3.13. The study instrument

The research methods denote the methods used for data generation and collection. In business research, the two methods of data collection are the primary and secondary data depending on the source of data. For this study, the primary data is collected through a questionnaire survey. Secondary data is included in the literature review which will help contextualize the findings of the study.

The nature of this research, its questions, objectives, and hypotheses and the chosen research philosophy have all indicated the questionnaire survey as the best suited tool. Questionnaires are employed in phenomenology and positivist studies as they allow the capture of a large amount of data in a relatively less period of time. In phenomenology studies, questionnaires can be designed with relative ease that allow respondents to share their responses so that the researchers can explore such data and build those insights which may not have been possible otherwise. For positivist and also, the pragmatic studies like the present one, questionnaire surveys allow data to be collected

from the randomly selected respondents in a structured manner which limits the risk of researcher's bias and preferences from interfering with the process (Creswell & Creswell, 2017). Their versatility and flexibility allow both quantitative and qualitative researchers to employ them in a variety of contexts using close ended and open-ended questions, structured and unstructured flow of items, and a number of communication media for data collection. All these benefits were important for this study and were the critical factors which prompted the researcher to choose questionnaire as his research method.

Some more advantages of questionnaires like their ability to collect a large amount of data in a relatively short period of time without compromising the integrity of the research or taxing the resources of the researcher and the versatility of its administration mechanisms were also the key in choosing the questionnaire survey for this research. This capability has become even more pronounced in recent years with the emergence of information technology-enabled tools and capabilities. Emails, videoconferencing, and web-based survey tools allow researchers to send questionnaires to respondents located in any part of the world at the touch of a button. This dispersal of questionnaires is possible in a variety of formats using multimedia tools. Such formats are now much more easily converted into electronic entries in MS Excel or SPSS files which make data entry, checks, and corrections swifter.

The data collected through questionnaires is considered to be more reliable and valid though this assumption is challenged by the post-modernists who assert that reliability and validity in qualitative studies should be measured in different criteria which should not be considered to be inferior to those of quantitative studies (Williams & Morrow, 2009). Despite this critique, the researcher in this study preferred using the questionnaire as he hopes for the findings from this study to be generalizable to the entire population of UAE organizations.

The researcher has remained mindful of the limitations of the questionnaire method as well. The researchers have to pay heed to a number of criteria while designing questionnaires. The items included in the questionnaire should completely explore the variables of study and should be guided by existing knowledge and theory. Even if the study proceeds with an inductive research philosophy, the questionnaire survey's open-ended questions need some basis in existing theory for them to carry some weight with the respondents. While drafting the questions, the researcher used such language, idioms, and phrases which are easily understood by the respondents. For this purpose, the validity of the questionnaire should be established by taking the feedback from some experts or employing the final questionnaire in a pilot study. This study has conducted a pilot study with 10 respondents to ensure the validity of the instrument and the understandability of the items for the respondents.

Some more criteria considered by experts while checking questionnaires are the kind of language used to describe the statements which should be simple and devoid of any overbearing words. It should also make sure that the respondents is not able to select socially acceptable answers or those responses which make him or her appear to be good in front of others (Sloan & Quan-Haase, 2017). It is also suggested that questionnaires should not involve any emotionally charged questions which may polarize the emotions and opinions of the respondents. In short, the questionnaire should be able to put the respondent at ease and make them answer questions in the clearest and easiest manner. All these factors were kept in mind while developing the questionnaire survey for this research.

While designing the survey, the researcher had to deliberate on the mode of administration of the survey. Questionnaires can be asked over the phone or through videoconferencing but in such cases the risk of respondent answering questions without due reflection or with a motive to give

those responses which make them appear to be good in front of the researcher become higher. Such questionnaire surveys can save time of travelling for personal meetings and hence, the cost while also offering an opportunity for the researcher to clarify any doubts while noting responses. The response rate using this mode is also higher as the researcher could ensure that he received complete entries.

Questionnaires can be sent through email, but the caveat was that the researcher should have the contact details of all respondents. This form of delivery is the most economical and the fastest however, it suffers from a low response rate and makes the need for sending reminders and please for completing the shared data even more. Such a mode of sharing questionnaire can be useful for surveys into sensitive information. However, the researcher is not able to guide and support the respondents during data collection.

Personal meetings could also have been explored for collecting data through questionnaires. Such meetings offer the benefit of researcher's presence in a high response rate and complete entries. However, it is the most expensive mode and is also not possible due to a constraint of resources and time for the present study. Sensitive information is difficult to capture in such circumstances while the risk of the researcher's bias reflecting in the findings is also higher.

3.13.1. Questionnaire Development

In this study, the questionnaire has enabled the elicitation of opinions from the managers of public sector organizations in Dubai about the business excellence implementation. As stated, this research is quantitative in nature, therefore, the questionnaire used to collect the data to test the research hypotheses was developed with items based on the existing literature. The research questions were converted, and the first draft of the questionnaire was developed with items

employing a Likert 7-point scale 1 signified Strongly Disagree, 2 Disagree, 3 Slightly Disagree, 4 Neutral, 5 Slightly Agree, 6 Agree, and 7 Strongly Agree. The process followed for developing the questionnaire was:

- The first draft of the questionnaire was first reviewed with the Director of the study after which it was sent for arbitration from academics who are subject matter experts in business excellence and quality with several publications and experience in this field. The details of the feedback received from the arbitrators is illustrated in the table 3.7 which is attached to the appendix.

The first expert is affiliated with a prominent University in New Zealand where he holds the position of the Head of the Centre for Organizational Excellence Research. Apart from his academic qualifications, his research interests are also aligned with those of this study as he works on a current subject of trying to understand how business excellence initiatives impact nation building. The salient points presented in his feedback were first to include such people in the sample who have knowledge of their organization's business excellence approach which should be the senior managers and not employees who may not know much about the design and ideate steps in the process. The expert further added that the design of the questionnaire should have questions in each part about different aspects of excellence covering the core principles of excellence and major categories of excellence rather than any generic questions. He also pointed out that organizations which have more positive attitude, understanding and actions related to each core principle are likely to have better outcomes. Furthermore, this expert noted several minor additions to the questionnaire and the study which are described in detail along with the responses and agreement to include or rejection from the study as it did not apply to its current scope in Appendix (N).

The second expert is a PhD in Economics who teaches the subject at a popular University of England. This expert is also a key Assessor of the Dubai Department of Finance on behalf of the Dubai Government's Excellence Program in 2017 which puts him in a privileged position of possessing an expert's view of the subject with some insight into the UAE's application of business excellence as well. This expert's guidance was more focused on the content validity of the questionnaire. He recommended that the researcher should consider each statement carefully and ensure that it is adding value to the variable he is exploring. All changes suggested by this expert were applied to the language of the items as they added a lot of value and simplified or clarified their meaning.

The third expert is also a PhD though in Business Administration. He a Project Lead and Researcher and has more than 20 years of proven practice in helping organisations improve their performance using the holistic EFQM Excellence Model as a reference. He pointed out that the questionnaire was lengthy and should be edited. He also pointed out the flaw in certain items as items are suggestive and give more than one option to answer into (e.g., come with 'and'). Such items were then edited to remove this ambiguity.

The fourth expert is also an illustrious personality. He is an Executive Director with the King Abdullah II Centre for Excellence while also being a Professor of Industrial Engineering in Jordan. This expert's opinion was to remove the usage of too many terms for talking about leadership and simplify the items. All his suggestions were accepted and applied to improve the content validity of the study instrument.

The last expert is an associate professor in business administration and has several published research papers published in international refereed journals related mainly to TQM and strategic management. Apart from the many small mistakes in grammar and content suggested by this

expert, he pointed out that Employees could understand success and excellence differently, it could mean different things to each employee. Moreover, he suggested that we cannot ask about two different things in the same sentence. This expert also pointed out that using too many terms to denote leadership can be misleading and confusing for the respondents.

- All suggestions given by the experts were applied by the researcher to improve the quality of his study instrument.
- The survey was also piloted with 10 employees who are colleagues of the researcher working in Dubai's public sector and studying in British University in Dubai. The researcher ensured that the questionnaire is understood by being simple and is not time consuming based on the feedback received from the piloted employees.
- Once all the feedback was incorporated in the questionnaire with no further need for any adjustment, it was ready for distribution among the targeted population. It is important to mention here that the small sample size of the pilot study made testing for internal reliability not possible.
- The researcher invested in an unlimited number of questions' membership for a sufficient period of time and then the link was shared with the targeted research sample. To ensure the achievement of the targeted representative sample of participation from Dubai government public organizations, the researcher approached DGEP (Dubai Government Excellence Program) management for their support in conducting the questionnaire. The program management studied the questionnaire and approved the support.
- The final questionnaire was uploaded as an online survey at the Lime Survey website by logging in and registration on the website (survey link: <https://gebreel.limequery.com/276223?lang=en>).

3.14. Construct measures and variables

The principal construct measures were based on existing instruments. Table 3.2 summarizes the first order and second order constructs together with their relative measurement items.

2nd Order Construct	1st Order Constructs	Item Number (52)
Excellence (EX)	Attitude (A)	8
	Knowledge (K)	8
	Action (AC)	8
Design Thinking (DT)	Empathize (EM)	5
	Define Implementation Problem (DI)	5
	Ideate for Implementation (II)	5
	Prototype of Solutions (PR)	5
---	Business Excellence Implementation Outcomes (BE)	8

Table 3. 2 List of Constructs and Measurement Items

All the variables have been assigned operational definitions based on the literature review and the purposes of this research. The operational definitions are added here for reference:

Business Excellence: A solution for the public sector to address its challenges in operations and realizing their outcomes by adopting the best practices followed by the world's most successful organizations (Talwar, 2011; Wen *et al.*, 2016). In this case, the unit of analysis is business excellence while the unit of observation is the opinions of the senior managers of the UAE public sector organizations about business excellence of their organizations.

Excellence: The combined construct of all those attitudes, knowledge, and actions that allow public sector organizations to reach their business excellence implementation outcomes. The unit of analysis is excellence while the unit of observation is the opinions of the senior managers of the UAE public sector organizations about attitudes, knowledge, and actions towards excellence in their organizations.

Attitude: The mental position of the public sector employees towards the requirements of business excellence framework which determines their willingness to perform in a manner that fulfils those requirements and thus, determines the successful realization of the outcomes (Andersen & Jessen, 2007; Haffer & Haffer, 2015). The unit of analysis is attitude towards business excellence while the unit of observation is the opinions of the senior managers of the UAE public sector organizations about attitudes towards excellence in their organizations.

Knowledge: Knowledge among public sector employees about the requirements of business excellence and the connection between them, their performance, and the organizational strategy (Gong, Zhou & Chang, 2013). The unit of analysis is knowledge towards business excellence while the unit of observation is the opinions of the senior managers of the UAE public sector organizations about knowledge towards excellence in their organizations.

Actions: Employee and leader actions which enable the fulfilment of business excellence requirements, keep them motivated, and support them with resources and policies (Andersen & Jessen, 2007). The unit of analysis is actions towards business excellence while the unit of observation is the opinions of the senior managers of the UAE public sector organizations about actions towards excellence in their organizations.

Design Thinking: A process of applying principles of design including the phases of empathy, definition, ideation, prototype development, and testing to design user experiences which can solve complex, unidentified problems (Brown & Wyatt, 2010; Roberts *et al.*, 2016). The unit of analysis

is design thinking while the unit of observation is the opinions of the senior managers of the UAE public sector organizations about design thinking in their organizations.

Empathy: A deep reflection and visualization of the needs of the employees, leaders, and the organization to fulfil the business excellence requirements which help define and appreciate the realities of their problems and the context. The unit of analysis is empathy towards design thinking while the unit of observation is the opinions of the senior managers of the UAE public sector organizations about empathy towards design thinking in their organizations.

Definition: The analysis and synthesis of information collected during empathy and using it with deliberation with other stakeholders to define the business excellence requirements and any barriers affecting their realization. The unit of analysis is definition of design thinking while the unit of observation is the opinions of the senior managers of the UAE public sector organizations about definition of design thinking in their organizations.

Ideation: The process of building on accumulated wisdom and insights by generating new ideas, building novel alternatives to solve existing problems, and bringing in innovation and creativity to business excellence. The unit of analysis is ideation towards design thinking while the unit of observation is the opinions of the senior managers of the UAE public sector organizations about ideation towards design thinking in their organizations.

Prototype Development: Building several prototypes which help realize the ideas generated in previous stages and allow leaders to assess the feasibility, efficiency, and effectiveness of the

generated solutions for meeting the requirements of business excellence. The unit of analysis is prototype development towards design thinking while the unit of observation is the opinions of the senior managers of the UAE public sector organizations about prototype development towards design thinking in their organizations.

Testing: The final stage in design thinking where the chosen prototype is tested for final implementation followed by the identification of new problems which are again inserted in the same cycle of empathize, ideate, define, prototype and testing. The unit of analysis is testing towards design thinking while the unit of observation is the opinions of the senior managers of the UAE public sector organizations about testing towards design thinking in their organizations.

These operational definitions will be used for guiding the research and achieving its pragmatic research philosophy which can explore the links between the independent variables of attitude, actions, knowledge, and excellence on business excellence implementation outcomes along with the possible moderation effect of design thinking and its determinants of empathy, definition, ideation, prototype development, and testing.

3.15. Validity and Reliability

For ensuring the validity of the research findings, the researcher has taken a lot of actions before, during, and after collecting the data. The data collection tool was developed according to an extensive literature review for the studies in the fields of excellence, TQM, quality, and design thinking. The alignment with the available academic literature was one of the important considerations for ensuring the validity of the research questionnaire in that it will measure what it was developed to measure (Bell, Bryman & Harley, 2018). The inclusion of feedback from a

team of experts in the process of arbitration ensured that the questionnaire would measure what it was developed to measure. This process of arbitration was conducted using Delphi technique, which is commonly recognized as an approach for collecting information from an expert in a certain field. This technique improves the validity and reliability of the questionnaire tool as the subject is delivered to all experts who are located in different geographical areas without knowing each other (Yousuf, 2007).

For testing the research instrument for reliability, the Cronbach Alpha test that uses the formula.

$$\text{Cronbach's } \alpha = \frac{n \times r}{(1 + (n-1)r)}$$

where (n = number of items, and r = Mean of correlations between all pairs) was used. A score that is less than 0.7 is believed to indicate that the internal correlation of the common range is low while a score above 0.7 or more is considered to indicate good reliability. The first reliability test was run for the pilot study in which all the scales scored a value above 0.7. This result implied that all scales are highly reliable as the collected data by the research instrument has captured a high level of consistency. Furthermore, the reliability analysis assured the researcher that the survey will measure the variables in the same process at different points in time.

The validity and reliability criteria are especially important to evaluate the level of precision and accuracy of the study's findings. Validity measures the extent to which the data collecting tool measures what it planned to measure (Ahmad, Zulkurnain & Khairushalimi, 2016). Therefore, validity represents the degree of accuracy of the research findings in representing what is happening in reality in the study's context. According to Creswell and Creswell (2017), there are two main kinds of validity. The internal validity assesses the extent to which the researcher can extract sound results from the collected data while the external validity measures the extent the

research's findings are applicable to the external world. In order to ensure internal validity, the researcher followed a lot of steps while designing the study, choosing the research questions, its location, the sampling, and the design of the questionnaire. The data collection tool was developed according to the findings of an extensive literature review. Delphi technique was used for research tool arbitration in order to ensure that the questionnaire will measure what it was designed to measure. A pilot study helped to finalize the questionnaires' suitability for the target sample.

In order to improve the external validity, the Dubai public sector community was targeted as a population for this study with 43 organizations and more than 92,000 employees. In addition, a representative sample of responses was achieved, with filled questionnaires of 141 which is above the minimum prescribed limit mentioned in the literature for SEM analysis. A questionnaire was designed in the format of an online solution and shared by email for all Dubai government entities. This gave the researcher the opportunity of improving the validity of the study as the system made it easier to revert back to the respondents if the questionnaires were found to not be filled well. Moreover, the contact information of the researcher was provided for any explanations and for clarifying any ambiguity or misunderstanding related to the questionnaire items. Furthermore, the researcher immediately checked the number of completed responses on the system.

In order to make sure that the findings are generalizable to the population of public sector organizations not in only the Arab world, but also in other countries, the researcher chose a pragmatic research approach with a sizeable sample and an objective data analysis technique of SEM analysis. These steps have ensured that the research design, data collection, and the subsequent analysis have been objective and transparent. Moreover, the literature review has helped to ensure that factors and measures considered important for the independent, moderating, and dependent variables have been secured from studies conducted in a variety of contexts. This

wide scope of insights included from studies has further helped to ensure that the findings are relevant to future research studies.

There are other forms of validity identified in literature as well. Criterion validity is the extent to which the research estimates the research variables as they occur in reality. To establish criterion validity, the research variables should show a high degree of similarity with the existing understanding of the concept. This study has engaged in a thorough literature review and used the accumulated knowledge to create the questionnaires and form the theoretical framework of the study. Therefore, the attempt has been to portray reality as transparently as possible. It is important to consider that criterion validity values may suffer even if the existing knowledge was incomplete or portrayed wrongly while the study's conclusions about the variables may be right. Moreover, studies like the present one may be exploring such variables that have not yet been explored in relationship to each other like business excellence and design thinking. Some concepts in social sciences do not lend themselves well to the estimation of criterion validity. In such cases, estimating criterion validity must be approached with due reflection.

There are two main kinds of criterion validity. Predictive validity is akin to reliability in the respect that it tries to estimate the scores of the dependent variable using the test scores of the study variables. Concurrent validity, on the other hand, confirms if the independent variables and criterion measures are related. To establish concurrent validity, researchers compare their instruments' ability to capture data in comparison to existing instruments used in other studies which are better established. Considering that this study does not have a precursor which has linked business excellence and design thinking, concurrent validity could not be established.

Content validity assesses the extent to which research variables represent the reality as it exists as per prior knowledge. Construct validity is the next category of validity which assesses the degree

to which the content of the instrument confirms and supports existing knowledge. This study has utilized a panel of experts to confirm the construct validity of its instrument which is presented in chapter 3. Different forms of construct validity exist to help estimate validity. Discriminant validity is the measure of how applying different measures to the construct will show a negative correlation, thereby, showing that the construct is best answered with the designated measure alone. Convergent validity assesses the degree of suitability of the measure chosen to estimate the construct. Convergent validity, therefore, is a positive way of confirming that the chosen measure is the right one for the construct and is assimilable with earlier measures in the field. Nomological validity also assesses the suitability of the measure to earlier ones in the same field but uses factor analysis to establish itself. This study assesses discriminant and convergent validity for each of the SEM models.

Reliability of a study is a measure of how consistent and free of errors are the findings from a study (Ahmad, Zulkurnain & Khairushalimi, 2016). Like validity, reliability too has been categorized. Test-retest reliability is the measure of how accurately the measure stands the test of time. An often-quoted example of test-retest reliability is of intelligence which remains stable over time. However, business excellence as a measure depends on the quality of leadership, company policies, and other factors which may show more variations than is the case with intelligence. Test-retest correlation of scores for the same organizations for assessing the research variables of business excellence and design thinking will help in establishing the reliability. Future studies can help in establishing test-retest reliability of the measure and variables with correlation values of 0.8 and above considered to be the threshold for assessment.

Internal consistency is one of the most commonly applied reliability measures. Internal consistency is a measure of the extent to which all items measure the same construct. It is assessed by

calculating the internal correlations between the item scores. In this study, for instance, all items in the scale of design thinking should show high internal consistencies. Though split half correlations are also used to calculate internal consistency by dividing the measure into two equal halves and then comparing their individual scores with scores above 0.8 showing a high level of internal consistency, this study uses the other method of calculating Cronbach's alpha to estimate its internal consistency. Cronbach's alpha assesses the Mean value of all possible split half correlations possible for the set of items measuring the scale.

In order to ensure that the instrument used in this study is reliable, Cronbach's alpha values were used to assess the internal consistency of each item to the overall instrument after the pilot study.

3.16. Reliability Test Results

Table 3.4 below provides the scale reliability summary for each variable:

No	Component	Number of Entered Items	Cronbach's Alpha
1	Attitude toward business excellence	8	0.904
2	Knowledge of business excellence	8	0.901
3	Action on business excellence	8	0.940
4	Empathize	5	0.963
5	Define implementation problem	5	0.954
6	Ideas for implementation	5	0.929
7	Prototype of solutions	5	0.977
8	Excellence implementation Outcomes	8	0.946

Table 3. 3 Reliability Test Results

The above table shows the high reliability of the research questionnaire which showed that it was suitably vetted to provide stable and consistent results as indicated by the Cronbach Alpha values which are above the cut off of 0.7 for the research variables (Schrepp, 2020). Though there was no need to accept any lower values, considering that social sciences' studies deal with human interactions and relationships, minor deviations from statistical values are believed to be acceptable.

The following nomenclatures was used for the research variables in the following tests in order to transform the variables for easy tracking and entry of the data analyses findings as illustrated in the table below:

Code	Variable
A	Attitude toward business excellence
K	Knowledge of business excellence
AC	Action on business excellence
EM	Empathize
DI	Define implementation problem
II	Ideas for implementation
PR	Prototype of solutions
EX	Excellence (attitude, knowledge, and action)
BE	Excellence implementation Outcomes

Table 3. 4 Nomenclature for variables

3.17. Population of the study

The term population means all group of things, organizations, events, or individuals that the researchers are concerned in examining (Creswell and Creswell, 2017). The population for this research consists of all governmental entities in Dubai as listed in the Dubai statistics centre (DSC), there are 43 government departments in Dubai city with 92,581 employees (Government of Dubai, 2017). All these entities were chosen as the population for this research. The reason for choosing Dubai as the location of this study was that since being established in 1997, the city's government excellence model is the first integrated program in the world which adopted world class excellence models implemented in the private sector for the government sector (Dubai Government Excellence Program, 2019). In 2015, the best practices from the private sector of Dubai and other UAE emirates were applied to the public sector, thus, creating a fourth-generation government excellence system. It is believed that this model has the potential to be applied in any government sector in the world. Another reason for the choice of this population was the unique opportunity available to the researcher who could utilize his working relationship with colleagues, has access to official channels, and is conversant with the proper etiquette to collect data from these organizations.

3.17.1. Sampling

The researcher targeted a representative sample from the managerial and senior levels of employees in the selected Dubai government organizations using convenience sampling. The rationale behind choosing this level of employees was that the knowledge of business excellence implementation, its outcomes, and the factors that influence the implementation was within the work purview of the managers. Gaining access to managers who are involved in business

excellence implementation in their organizations was difficult and required a close communication between the researcher and the respondents. As a result, convenience sampling was chosen.

For sample size determination, the significance value of 0.05 and a confidence level of 95% was chosen which is also the acceptable norm in the social science studies for achieving the research objectives in this designing stage (Etikan & Bala, 2017). The sample size for the study was determined using guidance from several rules of thumb which ranged from suggestions of 10 observations per measured criteria to a minimum threshold of 100 observations (Kline, 2015). In the implementation stage, the population of the online survey was 43 government organizations in which the questionnaire was distributed through the Dubai government excellence program official email along with a cover letter encouraging the DGEP coordinators to participate in the study. They were also asked to motivate the concerned employees in their organizations to fill the questionnaire to achieve the targeted responses.

The cover letter also emphasized the ethical conduct and the confidentiality of the collected data which was informed to be used for this research's purposes only. Initially, 68 responses were received in the first seven days after distributing the questionnaire after which a reminder email was sent to ensure everyone's participation. The researcher put a great effort in following with all concerned and after 4 weeks a total of 145 questionnaires were received. Four of these questionnaires were found to be incomplete or unusable and were discarded. The rest 141 were analysed in the software application Smart-PLS 3.0.

This research used the statistical methods that applicable for the framework and research questions and the distribution of the collected data. In the purpose of fulfilling the requirements of the research, as the quantitative research methodology is followed, the objective is to assess the relationship between the dependent variable (business excellence outcomes) and independent

variables (attitude, knowledge, action and excellence (attitude, knowledge and action together)), with the using of a moderating variable (design thinking & design thinking determinants). To achieve the research objectives, the below statistical methods were conducted by the author on the research collected data. Moreover, the Author used business excellence experts' opinions, as a second method, in the purposes of verifying the findings, ensure the research questions are properly answered, and ensure the research objectives are achieved. The illustration of the data analyses and statistical methods will be given in the following sections.

3.18. Data Analysis

The Partial Least Squares (PLS) technique was applied to analyse the causal relationships between the constructs using the software application Smart-PLS 3.0. The PLS approach was selected due to the exploratory nature of the research (Hair *et al.*, 2012). The two-step approach was utilized in data analysis as suggested by Henseler, Ringle and Sinkovics (2009). The first step involves the analysis of the measurement model while the second step tests the structural relationships among the latent constructs. The two-step approach aims at establishing the reliability and validity of the measures before assessing the structural relationship of the model.

3.18.1. An overview of Structural Equation Modelling (SEM)

The aim of the SEM model is to describe the regression weights and define the path coefficient between the latent factors. By allowing the flexibility of independent and dependent variables to assume each other's role, SEM makes the exploration of relationships easier and more realistic. While beginning the measurement of the path model, the intention is to identify standardized regression coefficients which can describe both direct and indirect influence of the variables. Usually, the relationship between the factors follows the theoretical framework which lends more support for the use of path model analysis in SEM. The benefit of including path model analysis

is that it makes model visualization and measurement easier with nodes representing each important factor and arrows showing the direction of the relationship (Akinwale, Ababtain & Alaraifi, 2019). SEM modelling is especially suited for identifying the moderation relationships as it allows better visualization of a number of dependent and independent variables. The Sobel test, for instance, is specially geared to check if the moderator has a significant impact on the relationship between the independent and dependent variables (Woody, 2011).

In these path model diagrams; each node is depicted as a circle or an elliptical figure while the factors are represented by square or a rectangle. In order to fulfil the aims of the SEM analysis, the Sobel test uses a 't' test to assess if the inclusion of the moderator makes any difference in the variables' relationship. However, the Sobel test has been criticized for being low on power and using conservative estimates which require a normal distribution of data in the variables (Lowry & Gaskin, 2014). This need for normal distribution of data assumes that the variable scores are symmetrically distributed, however, the results of Sobel test present a positive skewness with small estimates and very few large estimates. As a result, researchers and data scientists recommend the use of bootstrapping which is more tolerant of data which is not normally distributed while still better controlling for type 1 errors (Ahmad, Zulkurnain & Khairushalimi, 2016). Bootstrapping subjects the observations with their replacements several times while calculating the resampling, thereby, allowing the researchers to calculate and estimate the parameters.

One of the main advantages of the SEM is its ability to assess construct validity of measurements. In this instance, construct validity refers to the accuracy of measurements (Black *et al.*, 2017). In SEM analysis, construct validity is assessed by two main components of convergence and discriminant validity. Convergent validity refers to the similarity in degree of variance between the items which are the indicators of a specific construct. Convergent validity, on the other hand,

could be measured by considering the size of factor loading (standardized regression weights), Average Variance Extracted (AVE), and construct reliability (CR) among the sets of items in the construct. The factor loading estimates with values of 0.5 or greater and extracted average variance of 0.5 or higher show adequate convergence among the items in the construct (Ahmad, Zulkurnain & Khairushalimi, 2016). The average variance extracted can be calculated by dividing the sum square of the standardized factor loadings by the factor loading number. The construct reliability (CR) should be 0.6 or higher to show adequate internal consistency (Peterson & Kim, 2013). The CR is computed from the square sum of factor loadings and the sum of error variance terms for a construct.

The measurement items that represent each individual variable should also be verified through internal reliability analysis. Reliability is the degree to which a measure is error-free (Mohajan, 2017). To ensure that the items produce a reliable scale, Cronbach's alpha coefficient of internal consistency should be examined. A higher value of Cronbach's alpha refers to higher reliability with a maximum possible score of 1. For a reliable scale, Cronbach's alpha should not be lower than 0.7 (Schrepp, 2020).

Discriminant validity refers to the issue of how truly distinct a construct is from other constructs. Discriminant validity can be assessed by comparing the square root of the AVE for two constructs and their correlations (Henseler, Ringle & Sarstedt, 2015). Evidence of discriminant validity is achieved when the correlation between the two constructs is smaller than the square root of the AVE for each construct. Furthermore, correlations between the factors should not exceed 0.9 (Henseler, Ringle & Sarstedt, 2015).

To confirm the accuracy of the structural model, the value of R-square (R^2) which represents the portion of variance in the dependent variable as explained by its predictors should be above 0.30

as recommended by Zhang (2009). Besides estimating the magnitude of R^2 , the researchers have recently included predictive relevance developed by Stone (1974) and Geisser (1975), as additional model fit assessment. This technique represents the model adequacy to predict the manifest indicators of each latent construct. Stone-Geisser Q2 (cross-validated redundancy) was computed to examine the predictive relevance using a blindfolding procedure in PLS. Following the guidelines suggested by Chin (2010), a Q2 value of greater than zero implies the model has predictive relevance.

For the purpose of hypotheses testing, parameter estimates together with coefficient values were examined by apply bootstrapping with 1,000 replications (Wetzels, Odekerken-Schröder & Van Oppen, 2009). Parameter estimates are used to generate the estimated population covariance matrix for the model (Tabachnick, Fidell & Ullman, 2007). Coefficient values are derived by dividing the variance estimate by its standard error (S.E). When the critical value (C.R) or z-value is greater than 1.96 for a regression weight (standardized estimates), the parameter is considered to be statistically significant at the 0.05 levels.

3.19. Research limitations

As in the case of any other research, this study too faced limitations related to the constraints in research design, methodology, and data collection. The researcher considered these limitations as opportunities to improve the structure of the research wherever possible and to suggest areas for future research in the field of business excellence and design thinking in both private and public sectors.

The first limitation for this study is that it is limited to the public sector which is an opportunity to focus on providing a valuable solution for this vital sector. At the same time, its findings may not be generalizable to the private sector which opens up opportunities for future researchers to build

upon the evidence indicated in this study. The second limitation is the potential biases in responses as it has been claimed that respondents tend to overrate their responses to the extremes (Gray, 2019). This limitation was expected as not all the participants take the questionnaire with the same level of seriousness. This issue becomes all the more difficult to tackle when there are several research variables which makes the questionnaire long with a longer period of time needed for it to be answered. This limitation is common to all quantitative studies and the researcher handled it best by educating the respondents about the importance of the study and declaring the estimated time required to answer it.

Finally, the scope of the study is limited to the outcomes of the business excellence framework's implementation, therefore, other associated relationships of the framework with other variables are not included in the purview of this study. Such relationships can be explored by future researchers to improve the body of evidence for business excellence and its implementation in the public sector.

Another limitation of the study was the small sample size of the pilot study. The sample size was limited as the research participants come from a select group where extending the sample of the pilot may have affected the final sample. As a result, internal reliability of the questionnaire could not be established before utilising the instrument for the data collection.

The research structure and systematic approach in the below figure is summarizing the research road map. Following this process to a great extent can make the findings more robust and act as a guidance for the research actions in different stages to accomplish the defined objectives and reach the desired outcomes. The amended model sourced from (Green, 2008) illustrated below:

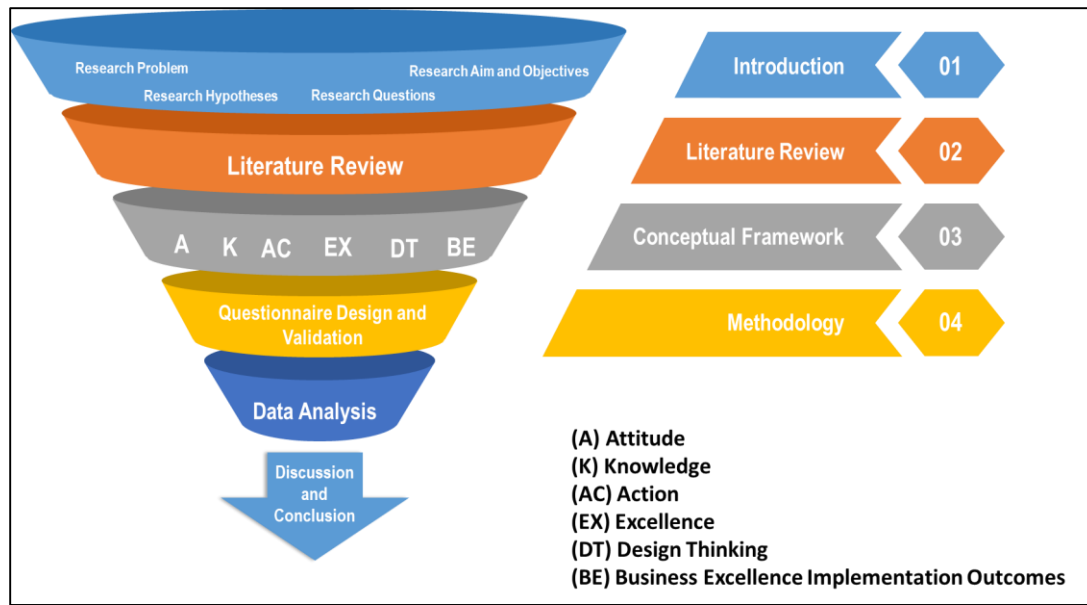


Figure 3. 5 Summary of research Structure and Data Analysis

3.20. Summary

This chapter has discussed the research methodology for this study explaining the research approach and philosophy, and the chosen research methods in detail. It has also presented the measures of the independent, moderating, and dependent variables which have helped create the questionnaire. This research has adopted an abductive research approach with a paradigm research philosophy. Furthermore, the study uses a quantitative research design with a questionnaire survey with closed-ended items employing a seven-point rating system as the main research tool to collect the needed data from the target sample to test the relationships between variables identified in the research conceptual framework. The collected data is analysed using SEM modelling through the software application Smart-PLS 3.0.

4. Chapter Four: Data Analysis

The research aim of this study is to examine the statistical relationships proposed in the conceptual framework. The research design is planned to ensure the validity and probability of generalizing the concluded results from the sample representing the identified population. Based on the literature review on business excellence and design thinking, a questionnaire was developed which could help explore the causal relationships between the independent variables of Attitude, Knowledge, and Actions on business excellence on the dependent variable of Excellence implementation outcomes while taking into consideration Design thinking as a moderating influence.

This chapter describes the SEM analysis conducted on the data collected through the 141 questionnaires and displays the empirical results to examine the hypotheses of this research, using Smart-PLS 3.0. This chapter comprises eight major sub-sections. Following the first section as introduction, the second section overviews the first, second and third order latent constructs and their relative measurement items. Furthermore, the third section presents the data screening. In this section, procedures used to sanitize the data by replacing missing values, removing outliers, and testing the normality of data distribution are described.

The fourth section provides a general explanation of the survey respondents and sample profile.

The fifth section represents the measurement models' results through Confirmatory Factor Analysis (CFA) used to assess the uni-dimensionality, reliability and validity of the constructs.

The sixth section provides the descriptive results of the constructs. The seventh section reports the results of structural models to test the hypothesized direct effects and moderation effects developed in this research. Finally, section eight provides a summary of the data analysis results and the findings.

4.1. Data Screening, Normality, and Common Method Bias

Data screening is necessary for ensuring that the data are correctly entered, free from missing values, outliers and to confirm that the distribution of variables is normal. Data can be missing if the respondents fail to answer one or more items in the survey or even if the researcher makes any mistakes while entering data. To ensure that the data was free from any missing values, frequency and missing value analysis were conducted for each measurement item in this study. The screening results of the data showed that there were no missing data in the raw file.

The normality test was conducted to determine whether the data is distributed in a normal curve. Data which is not distributed normally are highly skewed either to the left or to the right. These values are called kurtotic variables and they can distort relationships and significance tests (Das & Imon, 2016). In this study, skewness and kurtosis were employed to assess the normality of the data. In order to confirm the univariate normality, skewness and kurtosis values smaller than an absolute value of 3 and 10 respectively, were taken as the standards to demonstrate sufficient normality in this study (Cain, Zhang & Yuan, 2017). Following this suggestion, the data appears to show sufficient normality. Table 4.1 gives a summary of the skewness and kurtosis values for all items.

<i>Construct</i>	<i>Range of Skewness</i>	<i>Std. Error of Skewness</i>	<i>Range of Kurtosis</i>	<i>Std. Error of Kurtosis</i>
Attitude (A)	-2.726	0.204	8.790	0.406
Knowledge (K)	-2.606	0.204	7.856	0.406
Action (AC)	-2.663	0.204	8.999	0.406
Empathize (EM)	-2.674	0.204	7.859	0.406
Define Implementation	-2.384	0.204	6.543	0.406
Ideate for Implementation (II)	-2.249	0.204	5.783	0.406
Prototype of Solutions (PR)	-2.255	0.204	5.747	0.406
Business Excellence Implementation Outcomes (BE)	-1.777	0.204	2.009	0.406

Table 4. 1 Assessment of Normality for All Items

The results indicate that the skewness and kurtosis of all 52 items were present between the values of ± 3 and ± 10 respectively. As shown in Table 4.1, the skewness ranged from -2.726 to -0.578 and the kurtosis ranged from -0.946 to 8.999 for the 141 cases. Therefore, it is concluded that the data set of all items were well-modelled by a normal distribution.

Common method bias is a concern that the variance in responses happens as a result of the instrument used to measure opinions rather than the predispositions of the respondents (Creswell and Creswell, 2017). It is important to assess the data for possible contamination from the instrument. Since data was collected through cross-sectional research method and in a single time frame, which could cause common method variance (Aguirre-Urreta and Hu, 2019), Harman's single-factor test was employed to examine common method variance. In this test, all items measuring the latent variable are loaded into a common factor. The measured variance in scores due to the dependent variable should not be above 50%. In this study, the common factor value was observed to be 37.41% indicating that common method bias was not an issue for this study. The table of the test results is attached to the appendix.

4.2. Sample Profile

In this section, the respondents' background is presented. Figure 4-1 represents the frequencies and percentages of the demographical variables and are attached to the Appendix.

Demographics		
Gender	Frequency	Percentage
Male	117	83%
Female	24	17%
Total	141	100%
Education	Frequency	Percentage (%)
Less than Bachelors	5	3.5
Bachelors	95	67.4

Master's Degree	33	23.4
Doctorate Degree	8	5.7
Total	141	100%

Years of Experience	Frequency	Percentage
1-5 years	10	7.1
6-10 years	48	34.0
11-16 years	50	35.5
17-20 years	21	14.9
Above 20 years	12	8.5
Total	141	100

Position	Frequency	Percentage
Management	127	90.1%
Leadership	14	9.9%
Total	141	100%

Table 4. 2 Frequency of Demographics

In the 141 completed questionnaires 117 useful responses were received from male respondents (83%) and 24 from the females (17%). Therefore, the sample of this study is dominated by the male respondents which is expected from the distribution of employees as seen in field observations by the researcher. Respondents were asked to specify their Educational level in the questionnaires. The results show that 3.5% of the respondents stated that their education was below a Bachelor's degree, 67.4% had completed their graduation, 23.4% had a Master's degree and 5.7% had a doctorate.

Precisely 7.1% of the respondents stated they have an experience of 1-5 years, 34% had 6-10 years, 35.5% have 11-16 years, 14.9% have 17-20 years, and 8.5% had above 20 years of experience. Therefore, a majority of the respondents were seasoned professionals.

The respondents were also asked for their positions. 90.1% of the respondents stated that they occupied managerial positions while the rest of the 9.9% held a Leadership position. Consequently,

all respondents were well-positioned to hold an opinion about the implementation of business excellence in their organizations.

4.3. Correlation

Pearson's correlation was carried out between the study variables to assess their affinity for each other. The first table below shows the relationships identified for the study variables of attitude, excellence, knowledge, action, business excellence outcomes, and design thinking.

Correlations						
		Excellence	Attitude	Knowledge	Action	Business Excellence Outcomes
Excellence	Pearson Correlation	1				
Attitude	Pearson Correlation	.939**	1			
Knowledge	Pearson Correlation	.881**	.768**	1		
Action	Pearson Correlation	.891**	.791**	.618**	1	
Business Excellence outcomes	Pearson Correlation	.833**	.751**	.756**	.748**	1
Design thinking	Pearson Correlation	.900**	.810**	.925**	.702**	.761**
**, Correlation is significant at the 0.01 level (2-tailed). N=141						

Table 4. 3 Correlation between study variables

As is evident from the table above, excellence is strongly and significantly correlated with attitude ($r = 0.939^{**}$), knowledge ($r = 0.881^{**}$), action ($r = 0.891^{**}$), business excellence outcomes ($r = 0.833^{**}$), and design thinking ($r = 0.900^{**}$). As per Cohen (1988), all these relationships show high effect size. Furthermore, attitude is also strongly and positively related to knowledge ($r =$

0.768**), action ($r = 0.791^{**}$), business excellence outcomes ($r=0.751^{**}$), and design thinking ($r = 0.810^{**}$). Similarly, knowledge is positively correlated with action ($r = 0.618^{**}$), business excellence outcomes ($r=0.756^{**}$), and design thinking ($r = 0.925^{**}$). Action is significantly correlated with business excellence outcomes ($r=0.748^{**}$), and design thinking ($r = 0.702^{**}$). Lastly, business excellence outcomes are significantly correlated with design thinking with r value of 0.761 significant at $p<0.00$. Therefore, all variables show a high degree of correlation with each other.

The high degree of correlation between the variables suggests that multicollinearity may be an issue for further analysis. With independent variables showing a high correlation with each other, any change brought forth in one variable can have an impact on the others. The implications of multicollinearity are that the measured coefficients will be very sensitive to change and the estimated coefficients' measured values will be less precise. To control for multicollinearity, excellence which is a combined measure of attitude, knowledge, and actions of business excellence will offer an alternative to assess the influence of the dependent variables on the independent variables with greater accuracy.

Furthermore, Spearman's correlation of study variables was carried out with the demographic variables to assess any significant impact of the latter. Shown in Table 4.4, the Spearman's coefficient helped understand if the categorical variables of the demographic profiles were significant contributors to any of the study variables.

Correlations						
	Excellence	Attitude	Knowledge	Action	Business Excellence Outcomes	Design thinking

Gender	Pearson Correlation	-.191**	-.138	-.198*	-.195*	-.096	-.223*
	Sig. (2-tailed)	.023	.104	.019	.020	.258	.008
	N	141	141	141	141	141	141
Educationa l level	Pearson Correlation	.021	.050	-.002	.081	.001	.031
	Sig. (2-tailed)	.804	.555	.979	.342	.992	.714
	N	141	141	141	141	141	141
Job Duration	Pearson Correlation	.007	.029	-.046	.008	.022	.016
	Sig. (2-tailed)	.933	.735	.587	.924	.799	.850
	N	141	141	141	141	141	141
Position	Pearson Correlation	-.040	-.030	-.093	-.038	-.159	-.077
	Sig. (2-tailed)	.634	.721	.274	.652	.060	.367
	N	141	141	141	141	141	141

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

Table 4. 4 Spearman's Correlation between study variables and demographic variables

The above analysis indicates that it is only gender which is negatively and significantly related to some of the excellence variables. It is negatively correlated to excellence ($r = -.191^{**}$), knowledge ($r = -.198^{*}$), actions ($r = -.195^{*}$), and design thinking ($r = -.223^{*}$). However, attitude, business excellence outcomes are not related to the gender of the participants. Therefore, the gender of the participants only affects their opinions of excellence, their knowledge, actions, and design thinking perception.

4.4. Structural Equation Modelling (SEM)

The terms of SEM and path model analysis have been used to imply similar meaning in different studies. SEM, as a model, incorporates regression or path analysis with factor analysis using a set of latent or those factors which have not yet been studied (Marsh *et al.*, 2020). It is important to mention that moderators' action on the dependent variable can be assessed directly, as well as partially where the moderator impacts the dependent variable to only a certain extent. In the latter

relationships, the independent variables have leftover residuals after the moderator begin exercising its action. This action is better visualized through the following figure:

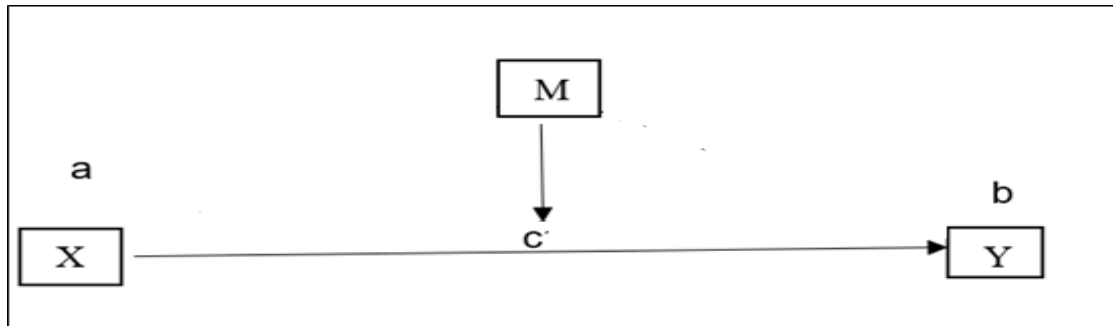


Figure 4. 1 A Simple Moderator Model (Hayes, 2017, p. 409)

In this figure, the relationship between the independent variable X and dependent variable Y is moderated by variable M. The path between X and Y is of a direct effect while the path via moderator M is an indirect route. Where a represents the coefficient of predicting the influence of M on X on Y, b denotes the influence of M on Y, and c' shows the direct effect between the variables. In this study, the independent variables of attitude, knowledge, actions, and excellence represent X, design thinking and its determinants are M, and business excellence implementation outcomes are Y.

4.4.1. Measurement Model (CFA) – Stage 1 of SEM

The measurement model or confirmatory factor analysis (CFA) is used to find out the links between manifest or observed and latent or unobserved variables. The measurement model could, therefore, be said to define the manner in which the latent or unobserved variables are assessed in terms of the manifest variables (Marsh *et al.*, 2020). The operationalization of constructs is a very important step in the process of SEM as it ensures the accuracy of the model (Hair *et al.*, 2012). Researchers have a choice among several established scales in attempting to ensure theoretical

accuracy of their models. However, despite the availability of a varied number of scales, they are often plagued by the problem of a lack of established scales and are, thus, driven to the development of new measurement scales or making great modifications in existing scales to accommodate the new context. Given all these considerations, the basis for the SEM analysis is in the selection of items to measure the constructs (Hair *et al.*, 2012).

Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) have several differences. The former is better suited in cases where little or no existing theory is available to guide the researcher in his analysis. In such exploratory studies, data analysis techniques of Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) and Bartlett's Test of Sphericity are conducted to judge if the collected data is suited for further analysis. The results of these tests are in values ranging from 0 to 1 with values scoring higher than 0.5 considered to be acceptable (Ahmad, Zulkurnain & Khairushalimi, 2016). KMO tests the level of multicollinearity between the factors which is a measure of linear correlation between the factors themselves rather than with the construct they are believed to contribute to. Bartlett's test of Sphericity contributes to understanding the level of homoscedasticity which is a measure of equal variances between the independent variables. Homoscedasticity ascertains whether the degree of disturbances observed in relationships between the variables is uniform for all independent variables' relationship with the dependent variable and not found to be disproportionate for any factor. After passing the acceptability threshold, the values are judged for their applicability. Values between 0.5 and 0.7 are believed to be average, 0.7 to 0.8 are considered good, and between 0.8 and 0.9 are considered to be very highly rated for their applicability to the model. Using these values, EFA identifies strong clusters of factors that can predict the dependent variable's scores while maintaining the construct validity. Using Principal Component Analysis (PCA), the final list of factors is

identified. They are also assessed using Varimax with Kaiser's normalization rotation to check the level of variance among their items. Any factors which achieve a higher value than one in their eigen values are flagged and noted for further analysis.

CFA, on the other hand, allows researchers exploring relationships between variables with a priori theory and indications of the flow of relationship. CFA uses structural equation modelling (SEM) to identify the large number of possible relationships between the research variables using structural equations. Such exploration makes it possible to identify and report even those relationships that may have been unobserved and hence, not heeded (Hair, Tatham & Black, 1998). The SEM technique is finding increasing application as it offers several advantages over its nearest rival, multiple regression. The main differences between SEM and multiple regression are that SEM makes it possible to assess both direct and indirect effect of independent variables on dependent variable, thus allowing the estimation of far more complex paths. Secondly, SEM understands that research variables are indicators of underlying factors which is possible to be incorporated into the SEM model. For instance, it is possible to measure the attitude of employees towards business excellence implementation by using a set of items that capture the senior managers' opinions of the attitudes. SEM, therefore, has a better degree of accuracy associated with the identification of path analysis and factor analysis as it allows a more thorough estimation of reliability and validity of the model (Lowry & Gaskin, 2014). Finally, SEM makes it possible to estimate the goodness of fit for the model in much easier terms than is possible otherwise.

Goodness of fit is estimated using absolute fit, incremental fit, and parsimony fit to judge the model fit. Absolute fitness indicators help identify how models created using existing theory actually fit the reality as captured through the data collection (Marsh, Hau & Grayson, 2005). Chi Square tests can estimate how the sample in the study compares on the selected criteria with the population's

characteristics. By highlighting the variances between the sample and the adjusted covariance matrices, Chi Square offers an option of estimating absolute fit of the model. It is used by most studies with less than two hundred sample units as it is highly sensitive to numbers above this threshold (Hair, Sarstedt & Ringle, 2019). Another technique for estimating fitness is the Goodness of Fit Index which measures the difference between the observed values of the model and the covariance matrix. In recent times, many more such indices like the Adjusted Goodness of Fit Index, Non-Normed Fix Index or Tucker-Lewis Index, and Comparative Fit Index which use the Root Mean Square Error of Approximation have arrived to estimate the linked variables in the model under study.

Compared to the absolute fit indicators, the incremental fit indicators differ in their application of chi-square. They do not apply chi-square to the model, rather they use its values to compare them with a standardized model with uncorrelated variables that signify the null hypotheses. Non-Normed Fix Index and Comparative Fit Index help estimate any proportion of difference in the model fit when comparing the model to the standardized one. The former is a non-normed index which allows for any values to be observed but the latter ranges from 0 to 1. The Non-Normed Fix Index is more versatile as it adds a penalty for any models that are disproportionately complex so that any contribution of the variables at a minimal level can be taken into account.

The final group of indicators are the parsimony indicators which are best suited for saturated complex models. Parsimony is a term that denotes less, and, in this context, it shows that the model has few parameters and hence, many degrees of freedom while estimating the factors. For estimating parsimony fit, Parsimony Goodness of Fit Index and the Parsimonious Normed Fit Index are used which allow the incorporation of degrees of freedom and an ability to reduce the scores if the model is found to be complex.

Among all three goodness of fit indicators, none are considered to be superior and no index has been identified as being the best (Kamaruddin & Abeysekera, 2013). In such circumstances, the choice of the best suited goodness of fit indicator is suggested to follow a series of decisions based on some guidelines. The first step is the degrees of freedom of the variables. The second step is to have an absolute fit index, an incremental fit index, a goodness of fit index, and one badness of fit index which can be the Root Mean Square Error of Approximation or Standardized Root Mean Square Residual.

In the CFA model, each of the constructs was assessed for their reliability and validity. Reliability is assessed using Cronbach's alpha, construct reliability (CR) and average variance extracted (AVE), whilst for validity, construct, convergent, and discriminant validity are assessed (Ahmad, Zulkurnain & Khairushalimi, 2016).

This study comprised two individual measurement CFA models for Excellence (EX) and Design Thinking (DT) as they are the second-order constructs proposed in this study. Furthermore, two overall measurement models were developed as there are two research models in this study. The next sub-sections discuss the development of each measurement model. The results of testing the uni-dimensionality of each construct are presented using Smart-PLS 3.0.

4.4.2. CFA Model for Excellence (EX)

In this section, 24 items were used to measure three first-order constructs in Excellence (EX): Attitude (A), Knowledge (K) and Action (AC). The initial CFA model for Excellence (EX) with all 24 items is portrayed in Appendix A. It is pertinent to mention here that the principal components analysis was conducted for all items in the questionnaire to check for cross-loadings that could indicate multicollinearity and affect the analysis. The components matrix is also attached to the Appendix (A) showing that though cross loadings were discovered, very few of the

coefficients were found to have more than 0.3 values for other factors than what they were expected to measure. In cases where the values were higher than 0.3, the difference between the principal factor and the cross loading was found to be more than 0.2. As a result, the factors were accepted.

4.4.2.1. Reliability and Convergent Validity

Table 4.5 represents the results of Cronbach alpha and convergent validity for the CFA model for Excellence (EX).

Construct	Item	Factor Loading	Average Variance Extracted (AVE) ^a	Composite Reliability (CR) ^b	Internal Reliability Cronbach Alpha
Attitude (A)	A1	0.817	0.580	0.916	0.914
	A2	0.810			
	A3	0.886			
	A4	0.677			
	A5	0.629			
	A6	0.722			
	A7	0.801			
	A8	0.715			
Knowledge (K)	K1	0.907	0.728	0.949	0.948
	K2	0.754			
	K3	0.769			
	K4	0.872			
	K5	0.848			
	K6	0.886			
	K7	0.905			
	K8	0.382 ^c			
Action (AC)	AC1	0.700	0.675	0.943	0.941
	AC2	0.911			
	AC3	0.934			
	AC4	0.842			
	AC5	0.867			
	AC6	0.684			
	AC7	0.824			
	AC8	0.772			

Construct	Item	Factor Loading	Average Variance Extracted (AVE) ^a	Composite Reliability (CR) ^b	Internal Reliability Cronbach Alpha ^c
Attitude (A)	A1	0.940	0.777	0.960	0.949

a: Average Variance Extracted = (summation of the square of the factor loadings)/{(summation of the square of the factor loadings) + (summation of the error variance)}.

b: Composite reliability = (square of the summation of the factor loadings)/{(square of the summation of the factor loadings) + (square of the summation of the error variance)}.

c: denotes for discarded item due to insufficient factor loading below cut off 0.5.

Table 4. 5 Cronbach Alpha and Convergent Validity for Excellence (EX) CFA Model

	A2	0.933			
	A3	0.146 ^c			
	A4	0.909			
	A5	0.596			
	A6	0.893			
	A7	0.923			
	A8	0.825			
Knowledge (K)	K1	0.493 ^c	0.751	0.954	0.942
	K2	0.644			
	K3	0.906			
	K4	0.906			
	K5	0.915			
	K6	0.868			
	K7	0.886			
	K8	0.382			
Action (AC)	AC1	0.91	0.800	0.970	0.964
	AC2	0.90			
	AC3	0.91			
	AC4	0.88			
	AC5	0.88			
	AC6	0.90			
	AC7	0.87			
	AC8	0.91			

As shown in Table 4.5, the results of assessing the standardized factor loadings of the model's items indicate that the initial standardized factor loadings of K8 was 0.382 which is below the cut-off of 0.5. Therefore, this item was removed from the model as recommended by Hair *et al.* (2012). The deletion of the item was not considered to have much impact on the questionnaire which had a total of 52 items. Furthermore, the removal did not significantly change the content of the constructs as they are conceptualized in multiple items. The standardized factor loadings of the remaining 23 items were all above 0.5 and ranged from 0.629 to 0.934.

Once the uni-dimensionality of the constructs was achieved, each of the constructs was assessed for their reliability. Reliability is assessed using average variance extracted (AVE), construct reliability (CR), and Cronbach's alpha. Table 4.5 shows that the AVE values which reflect the overall degree of variance in the indicators accounted for by the latent construct were 0.580, 0.728, and 0.675 for Attitude (A), Knowledge (K) and Action (AC) respectively. The values were above the cut-off of 0.5 as suggested by Hair *et al.* (2010).

The composite reliability values which depict the degree to which the construct indicators indicate the latent construct were observed at 0.916, 0.949, and 0.943 for Attitude (A), Knowledge (K) and Actions (AC) respectively. The values exceeded the recommended value of 0.6 for all constructs as recommended by Peterson and Kim (2013). The Cronbach's Alpha values which describe the degree to which a measure is error-free were observed at 0.914, 0.948, and 0.941 for Attitude (A),

Knowledge (K) and Actions (AC) respectively. All values were above the threshold of 0.7 as suggested by Nunnally and Bernstein (1994).

4.4.2.2. Discriminant validity

Table 4.6 represents the discriminant validity of the modified CFA model for Excellence (EX).

Variables	A	K	AC
Attitude (A)	0.762		
Knowledge (K)	0.821	0.853	
Action (AC)	0.849	0.651	0.821

Note: Diagonals represent the square root of the average variance extracted while the other entries represent the correlations.

Table 4. 6 Discriminant validity of Modified CFA Model for Excellence (EX)

The inter-correlations between the three sub-constructs in Excellence (EX) ranged from 0.651 to 0.853 which were within the threshold of 0.9 as recommended by Henseler, Ringle, & Sarstedt (2015), Brown & Wyatt (2010). Furthermore, as shown in Table 4.6, the correlations were less than the square root of the average variance extracted by the indicators demonstrating good discriminant validity between these factors. Upon examining the goodness of fit of the data, convergent and discriminant validity of the measurement model, it can be concluded that measurement scale to assess the constructs and their relative items in Excellence (EX) was reliable and valid. **Error! Reference source not found.** depicts the CFA model for Excellence (EX) with standardized factor loadings for the 23 remaining items.

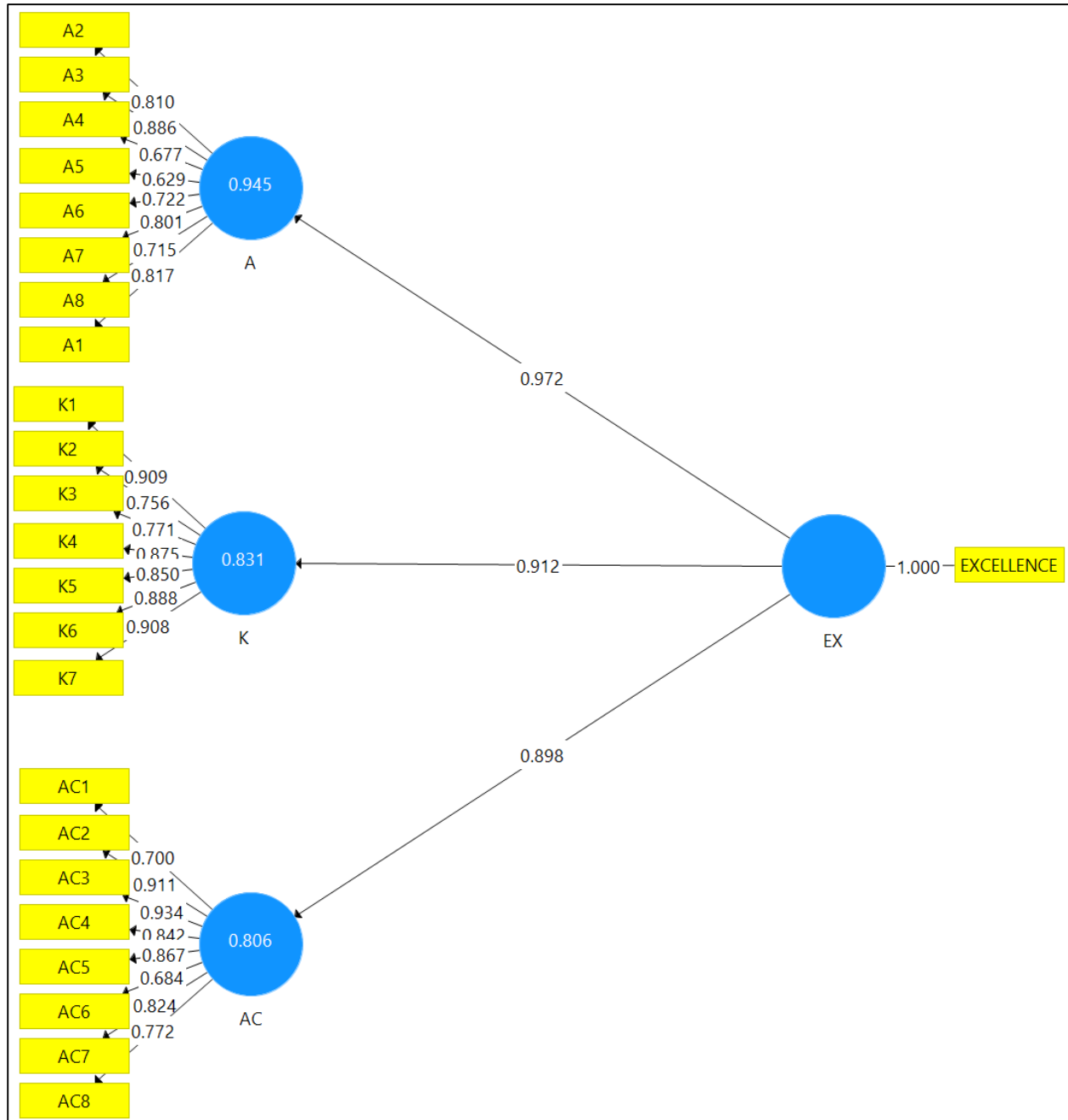


Figure 4. 2 Modified CFA Model for Excellence (EX) with remaining 23 Items

4.4.3. CFA Model for Design Thinking (DT)

In this section, 20 items were used to measure four first-order constructs in Design Thinking (DT): Empathize (EM), Define Implementation Problem (DI), Ideate for Implementation (II) and

Prototype of Solutions (PR). The initial CFA model for Design Thinking (DT) with all 20 items was portrayed in Figure 4-7.

4.4.3.1. Reliability and Convergent Validity

Table 4.7 represents the results of Cronbach alpha and convergent validity for the CFA model for Design Thinking (DT).

Construct	Item	Factor Loading	Average Variance Extracted (AVE) ^a	Composite Reliability (CR) ^b	Internal Reliability Cronbach Alpha
Empathize (EM)	EM1	0.923	0.843	0.964	0.964
	EM2	0.874			
	EM3	0.941			
	EM4	0.923			
	EM5	0.927			
Define Implementation Problem (DI)	DI1	0.916	0.811	0.955	0.956
	DI2	0.915			
	DI3	0.871			
	DI4	0.895			
	DI5	0.904			
Ideate for Implementation (II)	II1	0.871	0.735	0.932	0.931
	II2	0.919			
	II3	0.928			
	II4	0.786			
	II5	0.769			
Prototype of Solutions (PR)	PR1	0.924	0.895	0.977	0.977
	PR2	0.936			
	PR3	0.942			
	PR4	0.953			
	PR5	0.973			

^a: Average Variance Extracted = (summation of the square of the factor loadings)/{(summation of the square of the factor loadings) + (summation of the error variances)}.

^b: Composite reliability = (square of the summation of the factor loadings)/{(square of the summation of the factor loadings) + (square of the summation of the error variances)}.

Table 4. 7 Cronbach Alpha and Convergent Validity for Design Thinking (DT) CFA Model

As shown in Table 4.7, the results of assessing the standardized factor loadings of the model's items indicated that the initial standardized factor loading of all 20 items were above 0.5 ranging from 0.769 to 0.973. Table 4.7 shows that the AVE values were 0.843, 0.811, 0.735 and 0.895 for Empathize (EM), Define Implementation Problem (DI), Ideate for Implementation (II), and Prototype of Solutions (PR) respectively. All these values were above the cut-off 0.5 as suggested by Hair *et al.* (2010).

The composite reliability values were observed at 0.964, 0.955, 0.932, and 0.977 for Empathize (EM), Define Implementation Problem (DI), Ideate for Implementation (II), and Prototype of Solutions (PR), respectively. These values exceeded the recommended value of 0.6 for all constructs as recommended by Peterson and Kim (2013).

The Cronbach's Alpha values were 0.964, 0.956, 0.931, and 0.977 for Empathize (EM), Define Implementation Problem (DI), Ideate for Implementation (II) and Prototype of Solutions (PR) respectively. These values were all above the threshold of 0.7 as suggested by Nunnally and Bernstein (1994).

4.4.3.2. Discriminant validity

Table 4.8 represents the discriminant validity of the modified CFA model for Design Thinking (DT). Discriminant analysis establishes the discriminant validity of the model by assessing whether the constructs in a model are all different from each other (Henseler, Ringle and Sarstedt, 2015). In order to establish discriminant validity, the square of AVE scores for each construct have to be compared against the correlation between the constructs.

Moderating Variables	EM	DI	II	PR
Empathize (EM)	0.918			
Define Implementation Problem (DI)	0.882	0.900		
Ideate for Implementation (II)	0.866	0.898	0.857	
Prototype of Solutions (PR)	0.850	0.866	0.881	0.946

Note: Diagonals represent the square root of the average variance extracted while the other entries represent the correlations.

Table 4. 8 Discriminant validity of Modified CFA Model for Design Thinking (DT)

The inter-correlations between the four sub-constructs in Design Thinking (DT) ranged from 0.850 to 0.946 which were near the threshold of 0.9 as recommended by Henseler, Ringle, and Sarstedt (2015), Brown and Wyatt (2010). Furthermore, as shown in Table 4.8, the correlation values were less than the square root of the average variance extracted by the indicators, demonstrating good discriminant validity between these factors (Kline, 2005a). However, the prototype of solutions showed a correlation of 0.881 which was more than the squared AVE value of 0.857. This result suggests that items in PR are related more to items outside its construct. The researcher performed exploratory analysis to judge if removing any of the items forming the PR scale helped remove discriminant validity. The results showed that despite the evidence of discriminant validity, all items forming the PR scale contribute to the construct. Hence, it was decided to retain all items and continue with further analysis.

Upon examining the goodness of fit of the data, convergent and discriminant validity of the measurement model, it can be concluded that the initial measurement scale to assess the constructs and their relative items in Design Thinking (DT) was reliable and valid. Figure 4-7 depicts the CFA model for Design Thinking (DT) with the standardized factor loadings for the initial 20 items.

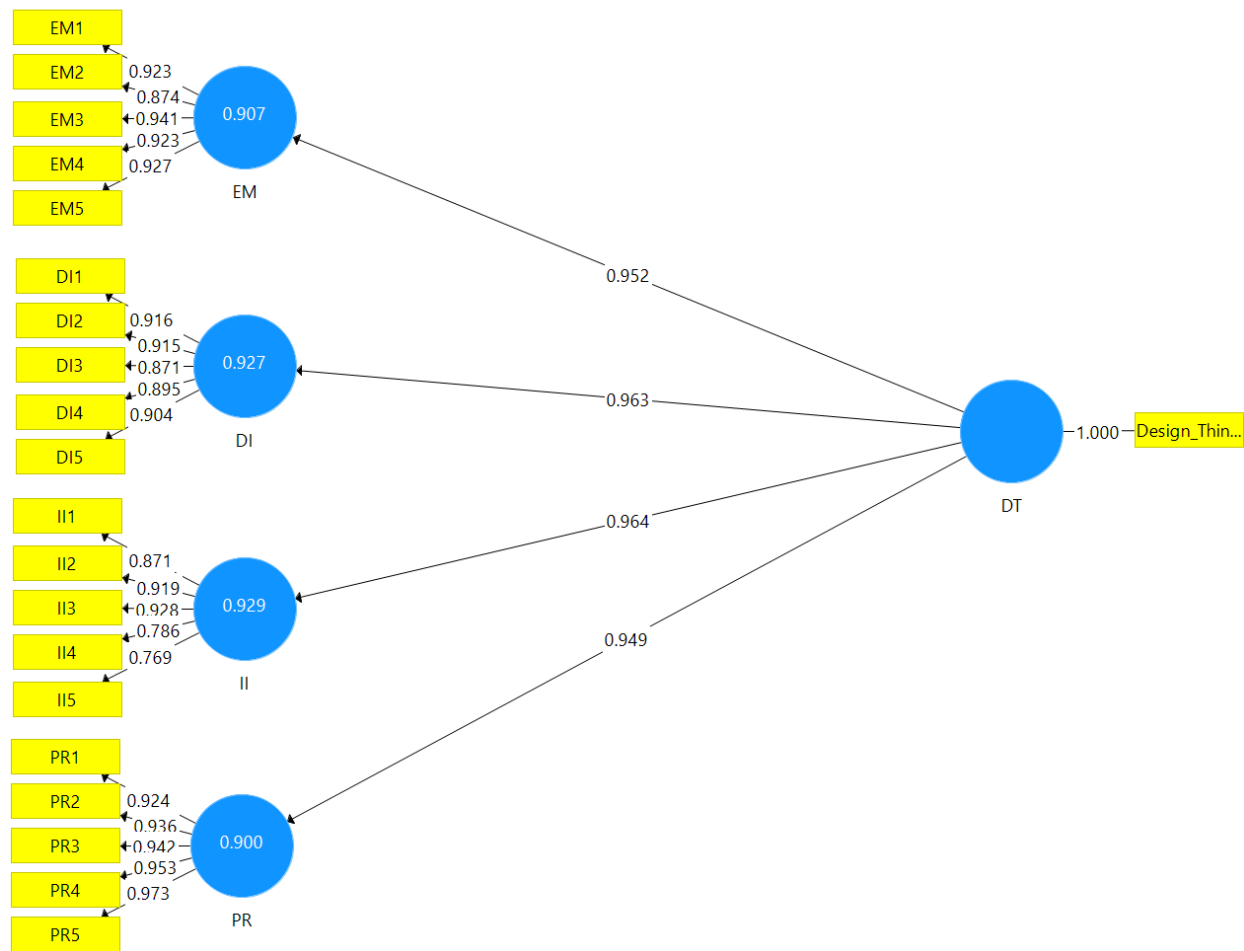


Figure 4. 3 Modified CFA Model for Design Thinking (DT) with Initial 20 Items

4.4.4. Overall CFA Model for Research Model 1

Confirmatory factor analysis was used to assess the overall measurement model for the research model 1. The overall measurement model included all latent constructs with their indicators specified in the previous individual CFA model. The initial measurement model 1 is portrayed in Figure 4-7.

4.4.4.1. Reliability and Convergent Validity

Table 4.9 represents the result of Cronbach alpha and convergent validity for the CFA model for research model 1.

<i>Construct</i>	<i>Item</i>	Factor Loading	Average Variance Extracted (AVE)^a	Composite Reliability (CR)^b	Internal Reliability Cronbach Alpha
Excellence (EX)	Attitude (A)	0.878	0.819	0.948	0.946
	Knowledge (K)	0.885			
	Action (AC)	0.878			
Design Thinking (DT)	Empathize (EM)	0.972	0.877	0.973	0.973
	Define Implementation Problem (DI)	0.924			
	Ideate for Implementation (II)	0.929			
	Prototype of Solutions (PR)	0.869			
Business Excellence Implementation Outcomes (BE)	BE1	0.982	0.699	0.948	0.950
	BE2	0.969			
	BE3	0.826			
	BE4	0.810			
	BE5	0.740			
	BE6	0.778			
	BE7	0.761			
	BE8	0.787			

^a: Average Variance Extracted = (summation of the square of the factor loadings)/{(summation of the square of the factor loadings) + (summation of the error variances)}.

^b: Composite reliability = (square of the summation of the factor loadings)/{(square of the summation of the factor loadings) + (square of the summation of the error variances)}.

Table 4. 9 Cronbach Alpha and Convergent Validity for Research Model 1 CFA Model

As shown in Table 4.9, the results of assessing the standardized factor loadings of the model's items indicated that the initial standardized factor loading of all items were all above the norm of 0.7 ranging from 0.740 to 0.982. The table also that the AVE values were 0.819, 0.877, and 0.699

for Excellence (EX), Design Thinking (DT) and Business Excellence Implementation Outcomes (BE), respectively. All these values were above the cut-off 0.5 as suggested by Hair *et al.* (2010). The composite reliability values were 0.948, 0.973, and 0.948 for Excellence (EX), Design Thinking (DT) and Business Excellence Implementation Outcomes (BE) respectively. These values exceeded the recommended value of 0.6 for all constructs as recommended by Peterson and Kim (2013).

The Cronbach's Alpha values were 0.946, 0.973, and 0.950 for Excellence (EX), Design Thinking (DT) and Business Excellence Implementation Outcomes (BE,) respectively. These values were all above the threshold of 0.7 as suggested by Nunnally and Bernstein (1994).

4.4.4.2. Discriminant validity

Table 4.10 represents the discriminant validity of the modified CFA model for research model 1.

Study Variables	EX	DT	BE
Excellence (EX)	0.905		
Design Thinking (DT)	0.836	0.937	
Business Excellence Implementation Outcomes (BE)	0.873	0.790	0.836

Note: Diagonals represent the square root of the average variance extracted while the other entries represent the correlations.

Table 4. 10 Discriminant validity of Modified CFA Model for Research Model 1

The inter-correlations between the three constructs in research model 1 ranged from 0.790 to 0.937 which were near the threshold of 0.9 as recommended by Henseler, Ringle, and Sarstedt (2015), Brown & Wyatt (2010). Furthermore, as shown in Table 4.10, the correlation values were less than the square root of the average variance extracted by the indicators, demonstrating good discriminant validity between these factors (Kline, 2005b). Upon examining the goodness of fit of the data and the convergent and discriminant validity of the measurement model, it can be

concluded that modified measurement scale to assess the constructs and their relative items in research model 1 was reliable and valid. Figure 4-8 depicts the CFA and structural model for research model 1 with standardized factor loadings of the items.

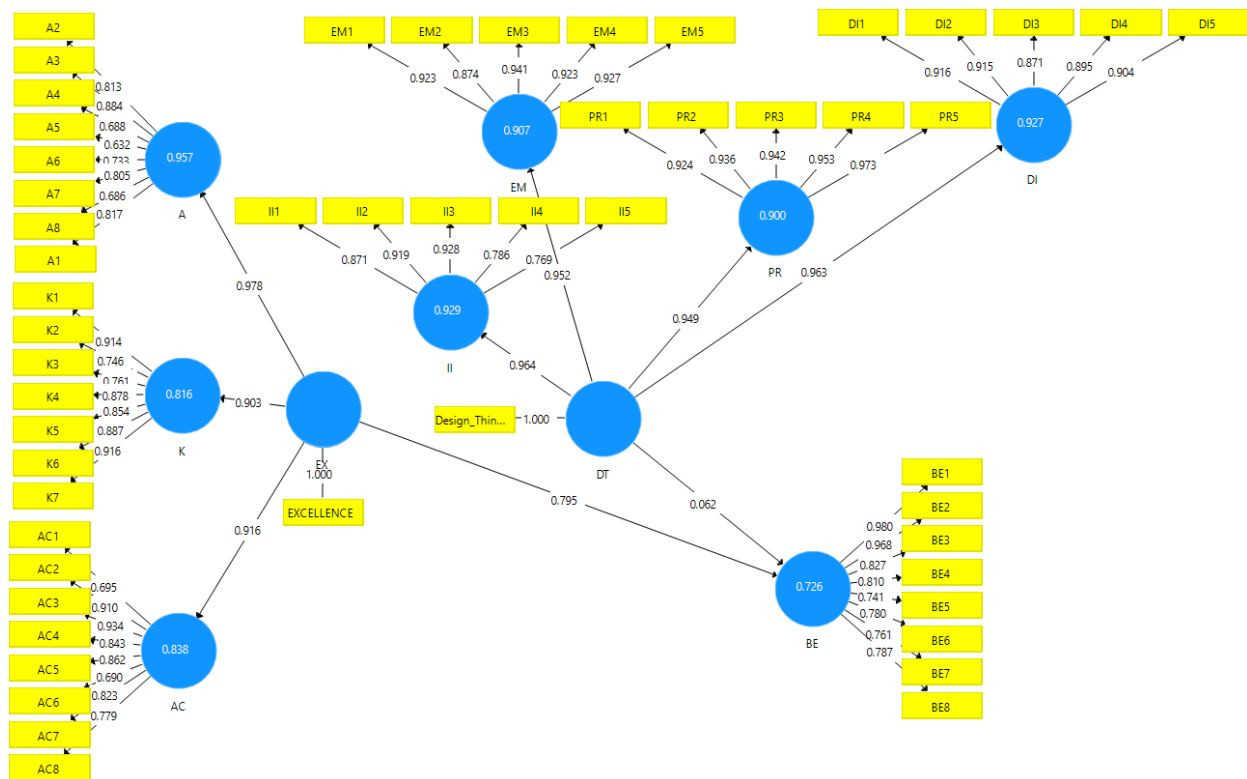


Figure 4. 4 Modified CFA and Structural Model for Research Model 1

4.4.5. Overall CFA Model for Research Model 2

Confirmatory factor analysis was used to assess the overall measurement model for the research model 2. The overall measurement model included all latent constructs with their indicators specified in the previous individual CFA models. The initial measurement model 2 is portrayed in Figure 4-4.

4.4.5.1. Reliability and Convergent Validity

The standardized factor loading, Cronbach's alpha and convergent validity for all of the constructs in research model 2 have already been examined in the previous CFA models. Therefore, there is no need to repeat the explanation here.

4.4.5.2. Discriminant validity

Table 4.11 represents the discriminant validity of the modified CFA model for Research Model 2.

Study Variables	A	K	AC	DT	BE
Attitude (A)	0.762				
Knowledge (K)	0.817	0.852			
Action (AC)	0.844	0.647	0.822		
Design Thinking (DT)	0.847	0.849	0.721	1.00	
Business Excellence Implementation Outcomes (BE)	0.813	0.791	0.790	0.777	0.837

Note: Diagonals represent the square root of the average variance extracted while the other entries represent the correlations.

Table 4. 11 Discriminant validity of Modified CFA Model for Research Model 2

The inter-correlations between the five constructs in the research model 2 ranged from 0.647 to 0.852 which were below the threshold of 0.9 as recommended by Henseler, Ringle, and Sarstedt (2015), Brown and Wyatt (2010). Furthermore, as shown in Table 4.11, the correlation was less than the square root of the average variance extracted by the indicators, demonstrating good discriminant validity between these factors (Kline, 2005a). Upon examining the goodness of fit of the data and the convergent and discriminant validity of the measurement model, it can be concluded that the modified measurement scale to assess the constructs and their relative items in research model 2 was reliable and valid. Figure 4-9 depicts the CFA and structural model for research model 2 with the standardized factor loadings of the items.

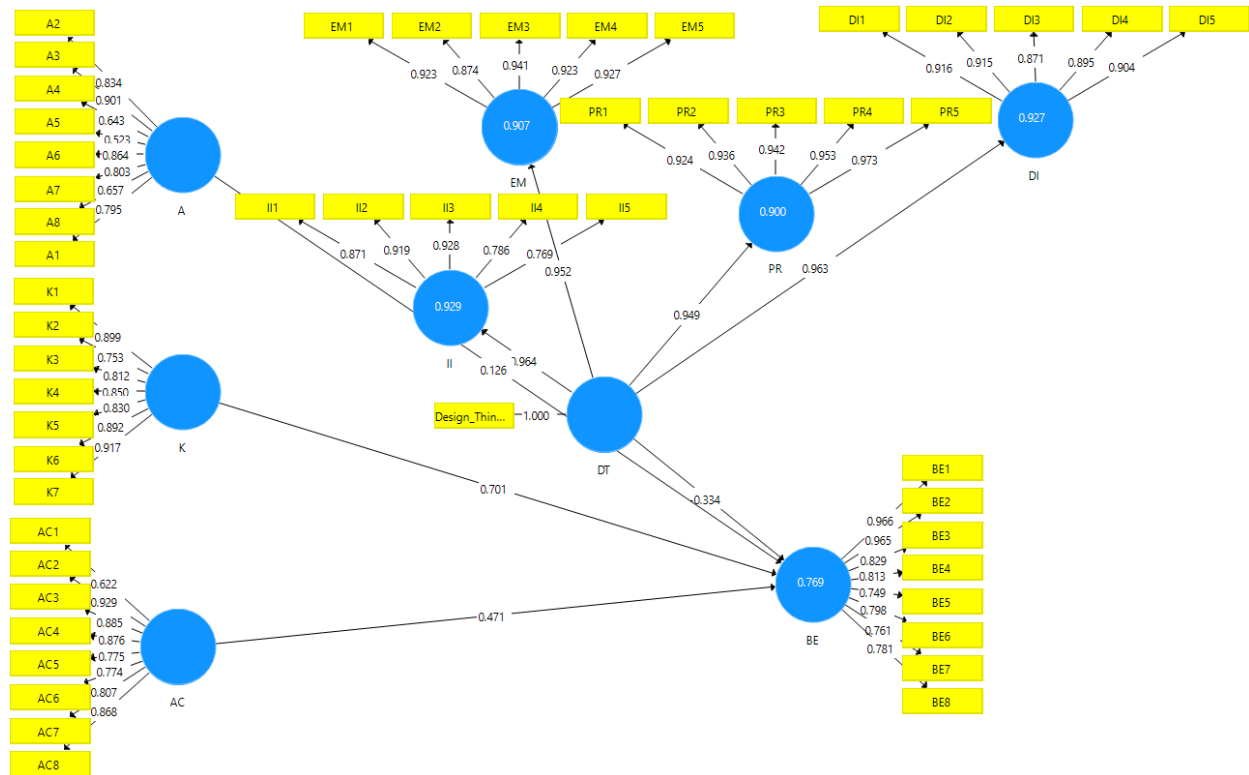


Figure 4. 5 Modified CFA and Structural Model for Research Model 2

4.5. Descriptive Analysis

In this analysis, covariance matrix method was used to calculate the descriptive function so that all of the variables could be included in the analysis. The composite scores of the variables were computed by parcelling the original measurement item scores. Parcels are the sum or averages of several individual indicators or items based on their factor loadings on the construct (Hair, Black & Barry, 2010; Marsh *et al.*, 2020). Table 4.12 displays the mean and standard deviation values of the constructs which were assessed on a 7-point Likert scale:

Constructs	Mean	Standard Deviation	Minimum	Maximum
Excellence (EX)	6.3540	.79241	2.78	7.00
Attitude (A)	6.3874	.77550	2.38	7.00
Knowledge (K)	6.3202	.99076	2.00	7.00
Action (AC)	6.3502	.88202	2.88	7.00
Design Thinking (DT)	6.2823	1.04832	2.25	7.00
Empathize (EM)	6.2496	1.17331	1.20	7.00
Define Implementation Problem (DI)	6.2965	1.09847	1.00	7.00
Ideate for Implementation (II)	6.3475	.98319	1.60	7.00
Prototype of Solutions (PR)	6.2355	1.22224	1.00	7.00
Business Excellence Implementation Outcomes (BE)	6.5638	.69511	4.63	7.00

Table 4. 12: Results of Descriptive Statistic for Variables

The values in Table 4.12 indicate that all constructs achieved Mean values above 6, indicating that the majority of respondents' perception toward these constructs were above the average. The highest Mean rating belonged to Business Excellence Implementation Outcomes (BE) with a Mean value of 6.564, followed by Attitude (A) with the Mean value of 6.387. The lowest Mean rating belonged to Prototype of Solutions (PR) with the Mean value of 6.235.

Standard deviation was applied as a dispersion index to indicate the degree to which individual responses within each variable differed from the variable Mean. Among the studied variables, the individual value of Prototype of Solutions (PR) deviated the most from its Mean (SD = 1.222). This standard deviation suggested reasonably high variability in the respondents' perception toward Prototype of Solutions (PR). In other words, the survey participants differed the most in their opinions in this variable. On the other side, the lowest deviation from Mean belonged to Business Excellence Implementation Outcomes (BE) with the standard deviation of 0.695.

4.6. Structural Models - Stage 2 of SEM

The structural equation model is the second main process of SEM analysis. Once the measurement model is validated, the representation of the structural model can be made by specifying the relationships among the constructs. The structural model provides details about the links between the variables by showing the specific details of the relationship between the independent or exogenous variables and dependent or endogenous variables (Marsh *et al.*, 2020). An evaluation of the structural model first focuses on the overall model fit, followed by the size, direction, and significance of the hypothesized parameter estimates as shown by the one-headed arrows in the path diagrams (Hair, Black & Barry, 2010). The final part involved the confirmation of the structural model of the study which was based on the proposed relationship between the identified and assessed variables.

In this study, the structural model was estimated to examine the research hypotheses using the PLS technique and bootstrapping with 500 replications. The next sub-sections discuss the development of the structural models for both research model 1 and 2 to test the research hypotheses described in Table 3.6.

4.6.1. Structural Model for Research Model 1

4.6.1.1. Direct Effects of the Variables

In the structural model for research model 1, the direct effect of Excellence (EX) as an independent variable on Business Excellence Implementation Outcomes (BE) as dependent variable was examined (H4). The PLS graph of structural model 1 for testing the direct effect of the hypothesized variables is summarized in Figure 4-10.

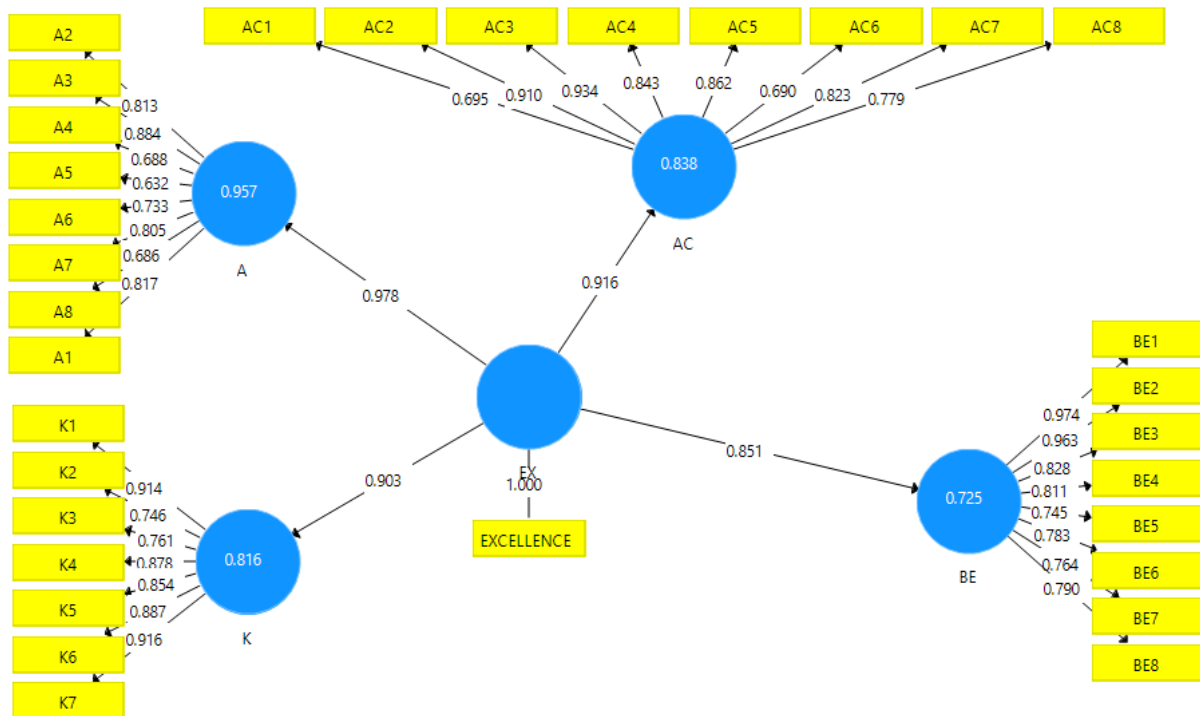


Figure 4. 6 PLS Graph of the Structural Model 1 – Direct Effect

The results of the Smart-PLS analysis for the structural model 1 are shown in Figure 4-11.

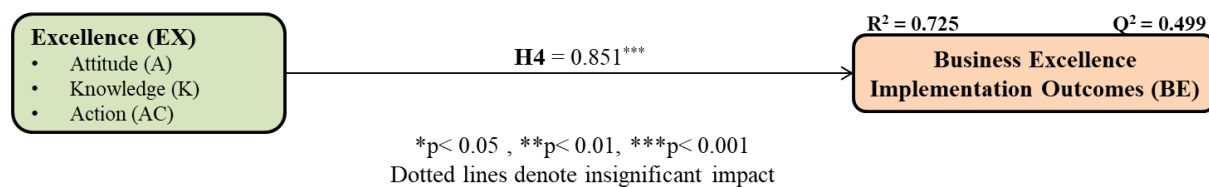


Figure 4.7 PLS Analysis Results of the Structural Model 1 – Direct Effect

The value of R^2 for the Business Excellence Implementation Outcomes (BE) was 0.725. This indicates that 72.5 percent of the variations in Business Excellence Implementation Outcomes (BE) are explained by its predictor which is Excellence (EX). The overall findings showed that the R^2 value satisfies the requirements for the 0.30 cut off value as recommended by Zhang (2009).

The value of Q^2 for the Business Excellence Implementation Outcomes (BE) was observed to be 0.499 which is far greater than zero showing the predictive relevance of the model as suggested by Chin (2010). To sum up, the model exhibits an acceptable fit and high predictive relevance. The coefficient parameters' estimates are then examined to test the hypothesized direct effects of the variables which were addressed in Table 3.6. The path coefficients and the results of the examination of the hypothesized direct effects in research model 1 are displayed in Table 4.13.

Path Shape	Path Coefficient	Standard Deviation	T-value	P-value	Hypothesis Result
EX → BE	0.851***	0.027	31.351	0.000	H4) Supported

*p< 0.05, **p< 0.01, ***p< 0.001

Table 4. 13 Examining Results of Hypothesized Direct Effect in Structural Model 1

H4) Excellence (EX) has a positive effect on Business Excellence Implementation Outcomes (BE)

As shown in Table 4.13, the t-value and p-value of Excellence (EX) in predicting the Business Excellence Implementation Outcomes (BE) were observed to be 31.351 and 0.00, respectively. It means that the probability of getting a t-value as large as 31.351 in absolute value is 0.00. In other words, the regression weight for Excellence (EX) in the prediction of Business Excellence Implementation Outcomes (BE) is significantly different from zero at the 0.001 level (two-tailed). As a result, Hypothesis 4 is supported by the results. The path coefficient was evaluated to be 0.851 indicating a positive relationship. It means when Excellence (EX) goes up by 1 standard deviation, Business Excellence Implementation Outcomes (BE) goes up by 0.851 standard deviations.

4.6.2. Moderation effect of Design Thinking (DT)

In this section, the moderation effect of Design Thinking (DT) as a moderating variable on the relationship between Excellence (EX) as an independent variable on the dependent variable of Business Excellence Implementation Outcomes (BE) was examined. The relative hypothesis is H8 as depicted in Table 3.6.

In order to confirm a third variable making a moderation effect on the relationship between the IV and DV, the nature of this relationship should show a change when the values of the moderating variable change. This is made possible by including an interaction effect in the model and checking to see if indeed such an interaction is significant or not. In applying this analysis, all predictors need to be standardized to make the interpretations easier and to avoid any problems of multicollinearity (Aiken, West & Reno, 1991). This standardization was done by subtracting a measured variable from its respective Mean and then dividing the result by its standard deviation. Having done this, the product of the standardised indicator was then calculated and used as an indicator of the latent interaction term. To determine whether the moderator effect is significant, the effect of the interaction term on the DVs should be significant.

In cases where a significant moderating effect is present, a technique suggested by Aiken, West and Reno (1991) is to generate plots for each interaction to show the effect of the moderator in the relationship between the predictor and the outcome variables. Based on this suggestion, the 4 cell Means were generated for mapping the interaction between the variables. One dichotomizes both independent variable (low and high) and moderating variable (low and high) and crosses these levels to obtain 4 cell Means. “Low” is defined as one standard deviation below the Mean and “high” is one standard deviation above the Mean.

The PLS graph of structural model 1 for testing the moderation effect of Design Thinking (DT) is summarized in Figure 4-12.

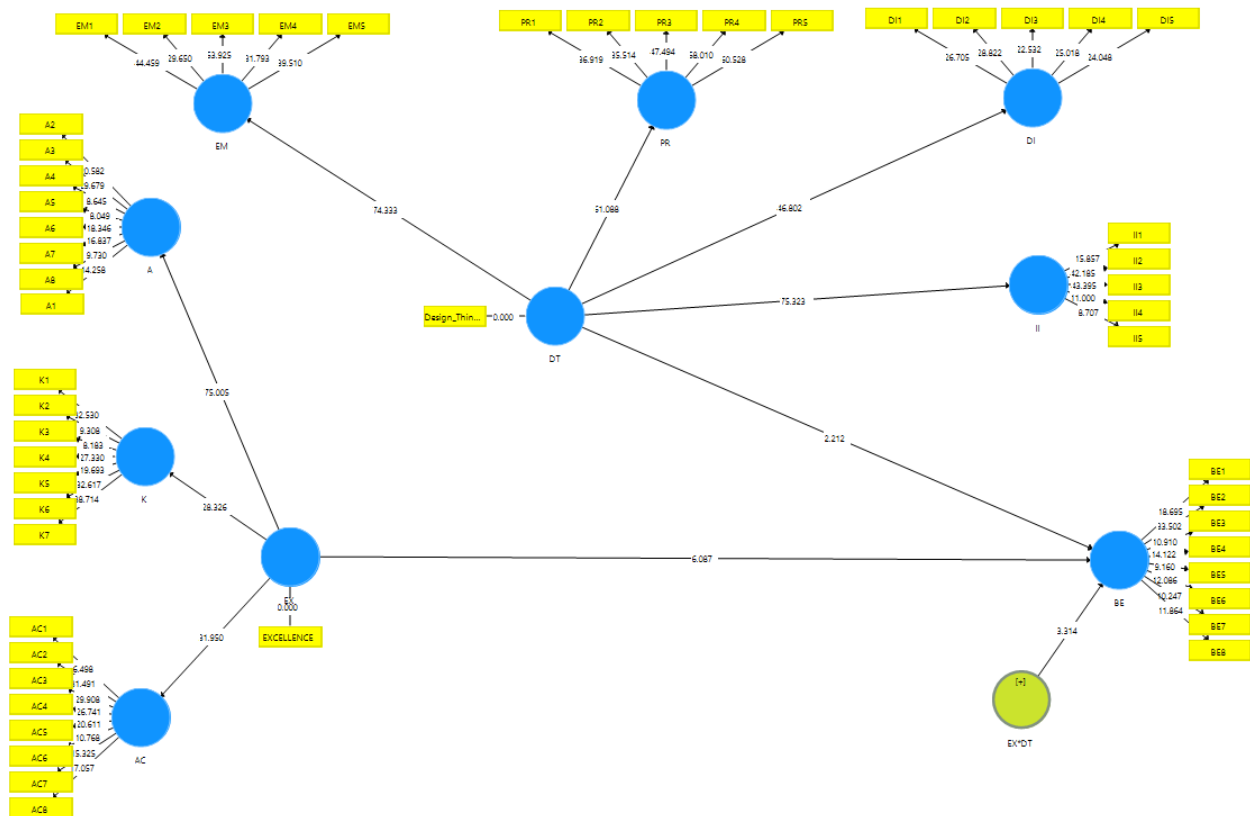


Figure 4. 8 PLS Graph of the Structural Model 1 – Moderation Effect

The Smart-PLS analysis results for structural model1, moderation effect portrayed in Figure 4-13.

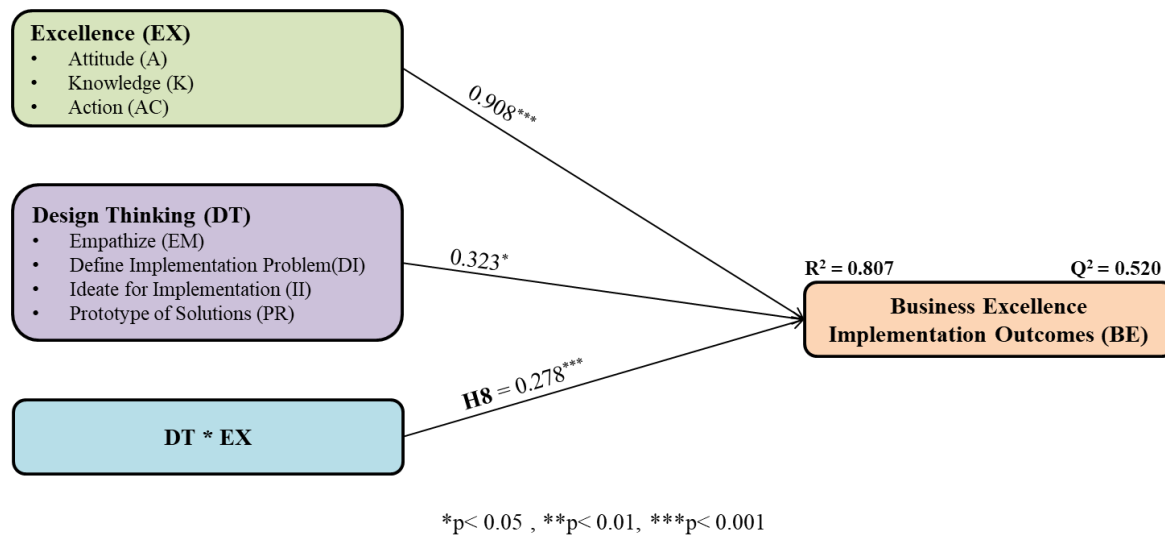


Figure 4. 9 PLS Analysis Results of the Structural Model 1 – Moderation Effect

The values of R^2 for the Business Excellence Implementation Outcomes (BE) was observed to be 0.807 which is above the threshold of 0.3 as recommended by Zhang (2009). The value of Q^2 for the Business Excellence Implementation Outcomes (BE) was 0.520 which is greater than zero showing the predictive relevance of the model as suggested by Chin (2010). As a result, the model is found to exhibit an acceptable fit and high predictive relevance.

The moderation effects of Design Thinking (DT) on the effect of the independent variable of Excellence (EX) on Business Excellence Implementation Outcomes (BE) was examined as presented in Table 4.14. Furthermore, the path coefficient was used to evaluate the contribution of each interaction term on the DVs. These moderation hypotheses were supported indirectly by literature. As there have been no studies linking design thinking directly with business excellence, studies which have explored design thinking in other contexts like social entrepreneurship (Chou, 2018), technical systems (Edmondson *et al.*, 2019; Maier & Reichtin, 2009) and to modern organizational systems that need interdependence, self-organization, and socio-cultural structures (Bobrek, Majstorovic & Sokovic, 2006). In addition, the common criteria between design thinking

and business excellence as suggested by their human centred focus (Oviatt, 2006; Vechakul, Shrimali and Sandhu, 2015). Similarly, a focus on strategy and goals (Beckman and Barry, 2007; Brown and Wyatt, 2010; Wattanasupachoke, 2012), using a problem solving methodology (Elsbach and Stigliani, 2018), and merging principles with business innovation (Clark and Smith, 2008; Wylant, 2008; Von Thienen *et al.*, 2018). Both design thinking and business excellence acknowledge the criticality of collaboration and team work (Hacker, Sachse and Schroda, 1998; Manzini, 2015), need for resources (McDonagh & Thomas, 2010; Micheli *et al.*, 2019), and user involvement in ensuring that planned goals are achieved (Rittel & Webber, 1973; Norman, 1988; Squires & Byrne, 2002; Krippendorff, 2006). Building prototypes (Sudsomboon, 2018), testing models (Stackowiak & Kelly, 2020), and experimentation are the hallmarks of good designs (Patel & Mehta, 2017). Similarly, business excellence models are also developed over a period of time through testing and validation.

Path Shape	Path Coefficient	Standard Deviation	T-value	P-value	Hypothesis Result
DT*EX→BE	0.278***	0.084	3.314	0.001	H8) Supported
DT→BE	0.323*	0.146	2.212	0.027	
EX→BE	0.908***	0.149	6.087	0.000	

*p< 0.05, **p< 0.01, ***p< 0.001

Table 4. 14 Moderation Effects of Design Thinking (DT) in Structural Model 1

H8) Design Thinking (DT) moderates the relationship between Excellence (EX) and Business Excellence Implementation Outcomes (BE)

As shown in Table 4.14, the effect of Design Thinking (DT) interaction with Excellence (EX) on Business Excellence Implementation Outcomes (BE) is statistically significant with the Coefficient Path = 0.278, T-value = 3.314, p-value = 0.001. This result indicated that Design Thinking (DT) positively moderates the relationship between Excellence (EX) and Business

Excellence Implementation Outcomes (BE). Thus, the hypothesis H8 was supported. Figure 4-15 shows the graph of moderating effect of Design Thinking (DT) on the relationship between Excellence (EX) as IV and Business Excellence Implementation Outcomes (BE) as DV.

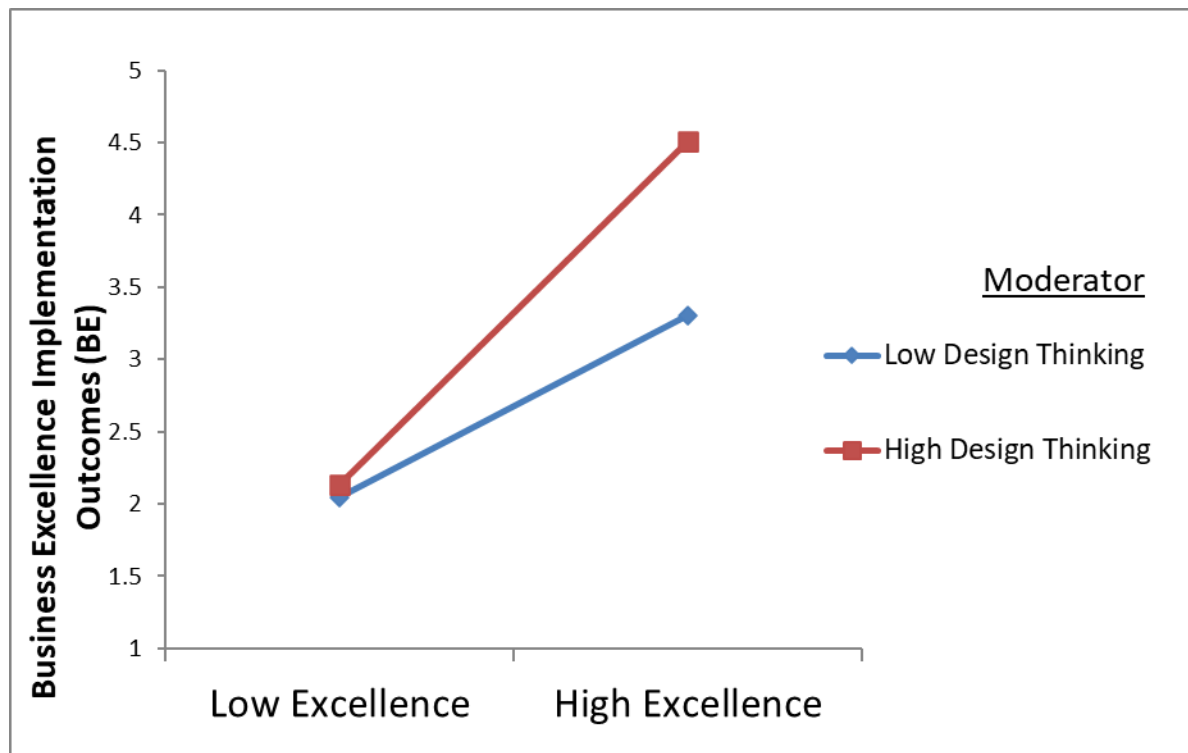


Figure 4. 10 Moderation Effect of Design Thinking (DT) on the Relationship between Excellence (EX) and Business Excellence Implementation Outcomes (BE)

As shown in Figure 4-10, the two lines indicated a positive relationship between Excellence (EX) and Business Excellence Implementation Outcomes (BE) when moderated by design thinking. Therefore, hypothesis H8 is accepted.

4.7. Structural Model for Research Model 2

4.7.1. Direct Effects of the Variables

In the structural model for research model 2, the direct effects of Attitude (A), Knowledge (K), and Action (AC) as independent variables on the dependent variable of Business Excellence Implementation Outcomes (BE) examined as expressed in H1, H2, and H3, respectively. The PLS graph of structural model 2 for testing the direct effect of the hypothesized variables is summarized in Figure 4-11.

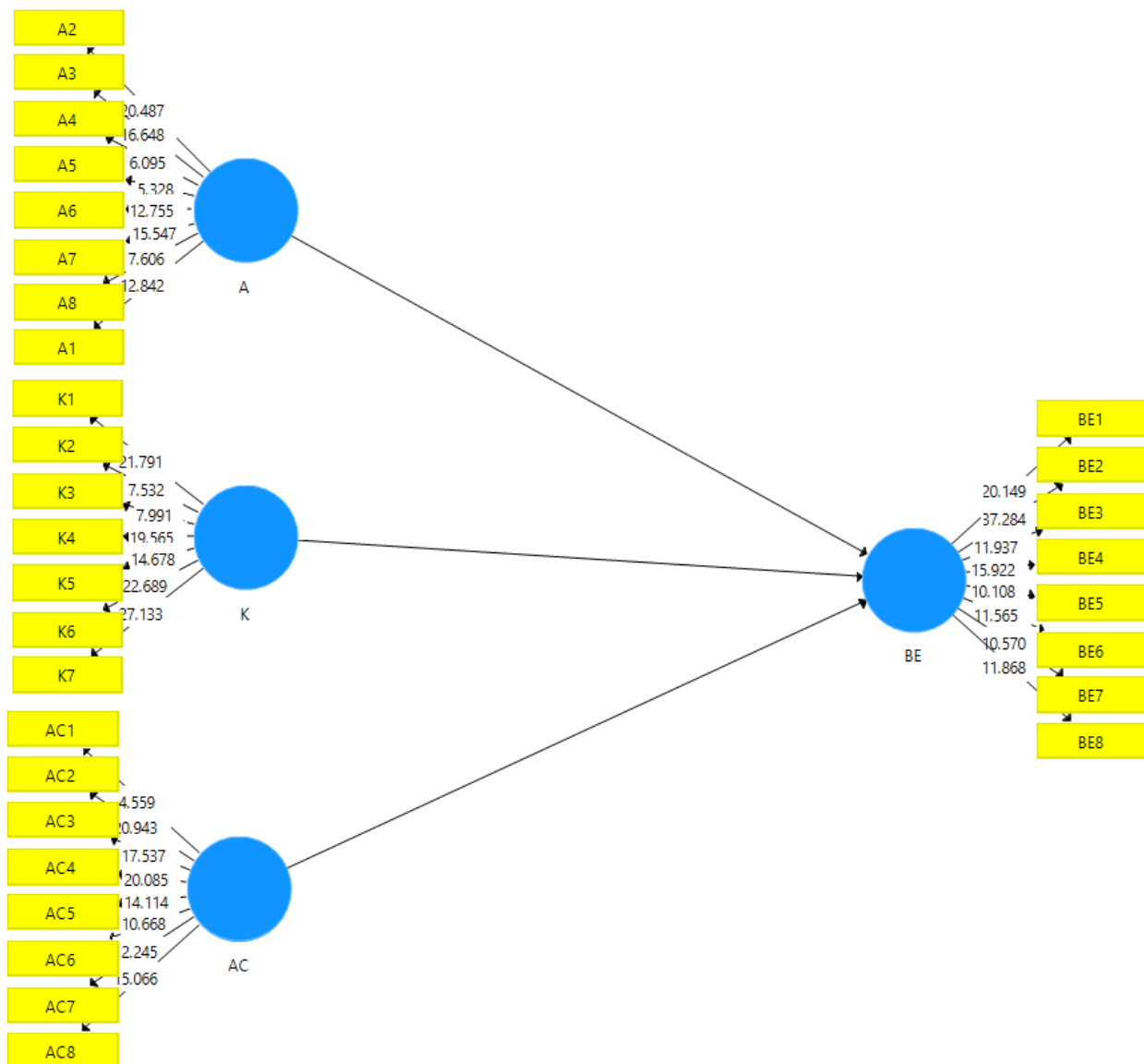


Figure 4. 11 PLS Graph of the Structural Model 2 – Direct Effect

The Smart-PLS analysis results for structural model 2 looking for a direct effect is portrayed in Figure 4-16.

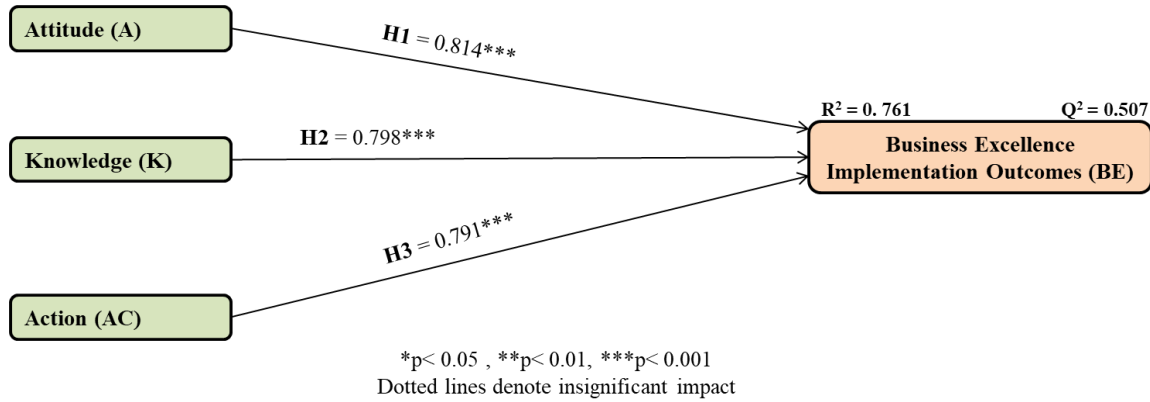


Figure 4. 12 PLS Analysis of the Structural Model 2

The value of R^2 for Business Excellence Implementation Outcomes (BE) was 0.761 which is above the cut-off of 0.30 as recommended by Zhang (2009). The value of Q^2 for Business Excellence Implementation Outcomes (BE) was 0.507 which is greater than zero which refers to the predictive relevance of the model as suggested by Chin (2010). As a result, the model exhibits an acceptable fit and has high predictive relevance.

The coefficient parameters estimates are then examined to test the hypothesized direct effects of the variables which were addressed in Table 2-1. The path coefficients and the results of examining hypothesized direct effects in research model 2 are displayed in Table 4.15.

Path Shape	Path Coefficient	Standard Deviation	T-value	P-value	Hypothesis Results
A → BE	0.814***	0.042	19.297	0.000	H1) Supported
K → BE	0.798***	0.032	24.825	0.000	H2) Supported

AC → BE	0.791***	0.051	15.475	0.000	H3) Supported
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*p< 0.05, **p< 0.01, ***p< 0.001

Table 4. 15 Direct Effects of the Constructs in Structural Model 2

As shown in Table 4.15, all three paths from Attitude (A), Knowledge (K) and Action (AC) on Business Excellence Implementation Outcomes (BE) were found to be statistically significant as their p-values were all below the standard significance level of 0.001. Thus, the hypotheses H1, H2 and H3 were supported.

The following section discusses the results of path analysis in relation to the above hypotheses in the structural model 2:

H1) Attitude (A) has a positive effect on Business Excellence Implementation Outcomes (BE).

As shown in Table 4.15, the t-value and p-value of Attitude (A) in predicting the Business Excellence Implementation Outcomes (BE) were 19.297 and 0.000, respectively. It means that the probability of getting a t-value as large as 19.297 in absolute value is 0.000. In other words, the regression weight for Attitude (A) in the prediction of Business Excellence Implementation Outcomes (BE) is significantly different from zero at the 0.01 level (two-tailed). Thus, H1 was supported. The path coefficient was 0.814 indicating a positive relationship. This result implies that when Attitude (A) goes up by 1 standard deviation, Business Excellence Implementation Outcomes (BE) goes up by 0.814 standard deviations.

H2) Knowledge (K) has positive effect on Business Excellence Implementation Outcomes (BE)

The t-value and p-value of Knowledge (K) in predicting the Business Excellence Implementation Outcomes (BE) were 24.825 and 0.000, respectively. It means that the probability of getting a t-value as large as 24.825 in absolute value is 0.000. In other words, the regression weight for

Knowledge (K) in the prediction of Business Excellence Implementation Outcomes (BE) is significantly different from zero at the 0.01 level (two-tailed). Thus, the Hypothesis H2 was supported. The path coefficient was 0.798 indicating a positive relationship. This result means that when Knowledge (K) goes up by 1 standard deviation, Business Excellence Implementation Outcomes (BE) go up by 0.798 standard deviations.

H3) Action (AC) has positive effect on Business Excellence Implementation Outcomes (BE)

The t-value and p-value of Action (AC) in predicting the Business Excellence Implementation Outcomes (BE) were observed to be 15.475 and 0.000, respectively. These values imply that the probability of getting a t-value as large as 15.475 in absolute value is 0.000. In other words, the regression weight for Action (AC) in the prediction of Business Excellence Implementation Outcomes (BE) is significantly different from zero at the 0.01 level (two-tailed). Thus, the hypothesis H3 was supported. The path coefficient was observed to be 0.791 indicating a positive relationship. As a result, when Action (AC) goes up by 1 standard deviation, Business Excellence Implementation Outcomes (BE) go up by 0.791 standard deviations.

4.8. Moderation Effect of Design Thinking (DT)

In this section, the moderation effect of Design Thinking (DT) on the relationships between the independent variables of Attitude (A), Knowledge (K) and Action (AC) on Business Excellence Implementation Outcomes (BE) were examined. The relative hypotheses are H5, H6 and H7 respectively as depicted in Table 3.6.

The PLS graph of structural model 2 for testing the moderation effects of Design Thinking (DT) is summarized in Figure 4-17.

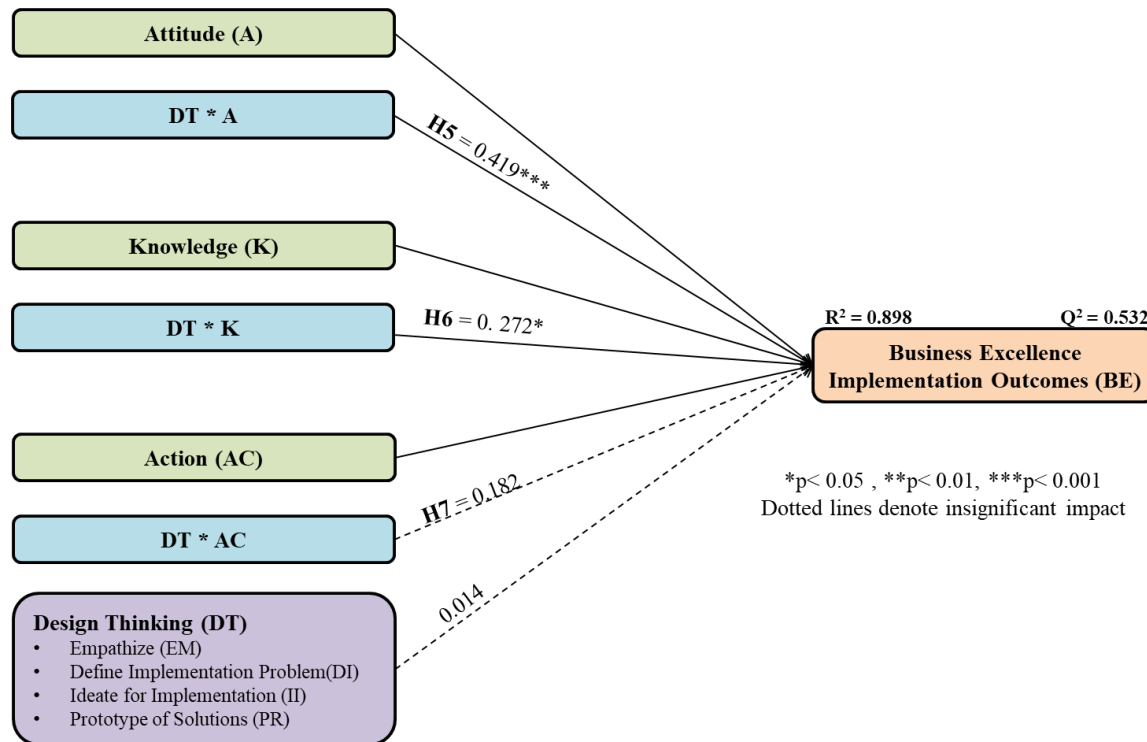


Figure 4. 14 PLS Analysis Results of the Structural Model 2 – Moderation Effect

The value of R^2 for Business Excellence Implementation Outcomes (BE) was observed to be 0.898 which is above the threshold of 0.3 (Zhang, 2009). The value of Q^2 for Business Excellence Implementation Outcomes (BE) was observed 0.532 which is larger than zero which refers to the predictive relevance of the model (Chin, 2010). In sum, the model exhibits an acceptable fit and a high predictive relevance.

The moderation effects of Design Thinking (DT) on the effects of Attitude (A), Knowledge (K), and Action (AC) on Business Excellence Implementation Outcomes (BE) were examined as presented in Table 4.16. Furthermore, the path coefficient was used to evaluate the contribution of each interaction term on the DVs.

Path Shape	Path Coefficient	Standard Deviation	T-value	P-value	Hypothesis Result
DT*A→BE	0.419***	0.094	4.462	0.000	H5) Supported
DT*K→BE	0.272**	0.117	2.459	0.014	H6) Supported
DT*AC→BE	0.182	0.104	1.746	0.081	H7) Rejected

*p< 0.05, **p< 0.01, ***p< 0.001

Table 4. 16 Moderation Effects of Design Thinking (DT) in Structural Model 2

As shown in Table 4.16, the interaction of Design Thinking (DT) with Attitude (A) and Knowledge (K) has significant effects on Business Excellence Implementation Outcomes (BE) because the p-values are less than the standard significant level of 0.05. Therefore, hypotheses H5 and H6 are supported. However, the relationship between Actions (AC) and Business Excellence Implementation Outcomes (BE) moderated by design thinking (DT) is not supported, rejecting Hypothesis H7.

The following section discusses the results of path analysis in relation to the above hypotheses in the structural model 2.

H5) Design Thinking (DT) moderates the relationship between Attitude (A) and Business Excellence Implementation Outcomes (BE)

As shown in Table 4.16, the effect of Design Thinking (DT)'s interaction with Attitude (A) on Business Excellence Implementation Outcomes (BE) was statistically significant at 0.05 level (Coefficient Path = 0.419, T-value = 4.462, p-value = 0.000). This result indicated that Design Thinking (DT) moderates the relationship between Attitude (A) and Business Excellence Implementation Outcomes (BE). Thus, the hypothesis H5 was supported. Figure 4-19 shows the graph of moderating effect of Design Thinking (DT) on the relationship between Attitude (A) as IV and Business Excellence Implementation Outcomes (BE) as DV.

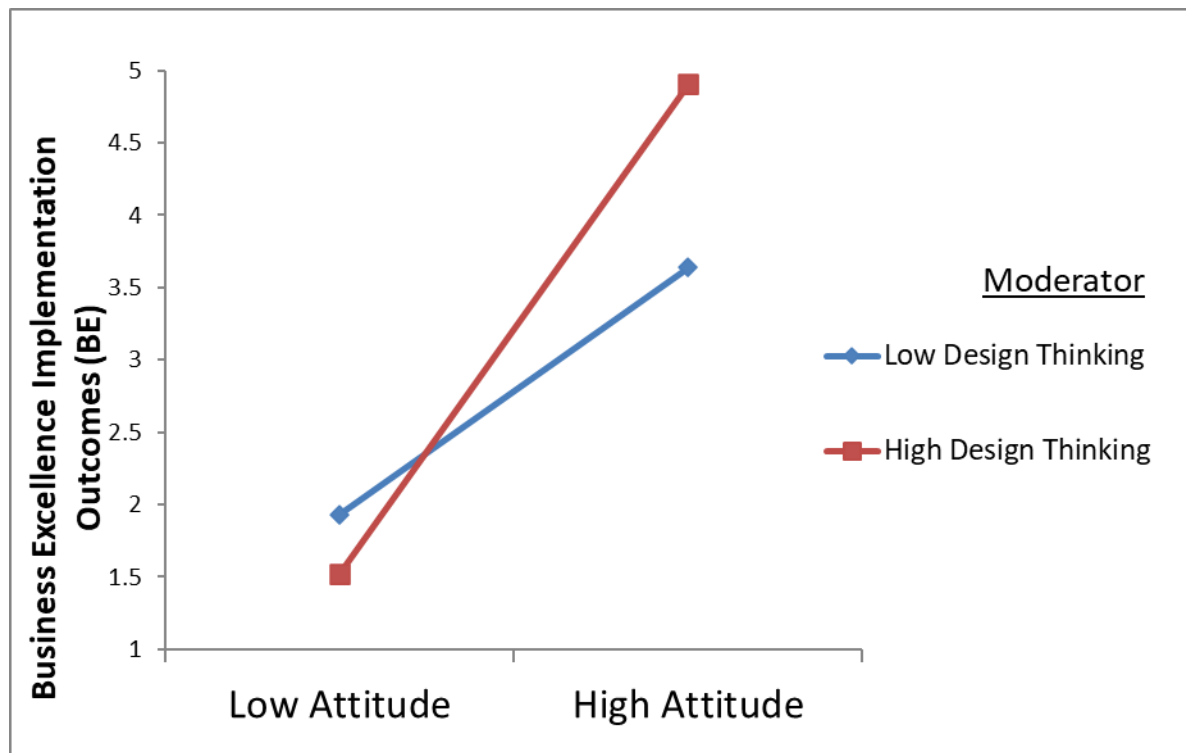


Figure 4. 15 Moderation Effect of Design Thinking (DT) on the Relationship between Attitude (A) and Business Excellence Implementation Outcomes (BE)

As shown in Figure 4-19, the two lines were not parallel which indicated the existence of a moderation effect. The relationship between Attitude (A) and Business Excellence Implementation Outcomes (BE) was weakly positive for low levels of Design Thinking (DT) while the relationship was strongly positive for high levels of Design Thinking (DT). These results indicate that with an increase in the level of Design Thinking (DT) as a moderator, the effect of Attitude (A) as IV on Business Excellence Implementation Outcomes (BE) as DV will increase. Thus, it can be concluded that Design Thinking (DT) positively moderates the relationship between Attitude (A) and Business Excellence Implementation Outcomes (BE).

H6) Design Thinking (DT) moderates the relationship between Knowledge (K) and Business Excellence Implementation Outcomes (BE)

As shown in Table 4.16, the effect of Design Thinking (DT)'s interaction with Knowledge (K) on Business Excellence Implementation Outcomes (BE) was statistically significant (Coefficient Path = 0.272, T-value = 2.459, p-value = 0.014). This result indicates that Design Thinking (DT) does moderate the relationship between Knowledge (K) and Business Excellence Implementation Outcomes (BE). Thus, the hypothesis H6 was accepted. Figure 4-20 shows the graph of moderating effect of Design Thinking (DT) on the relationship between Knowledge (K) as IV and Business Excellence Implementation Outcomes (BE) as DV.

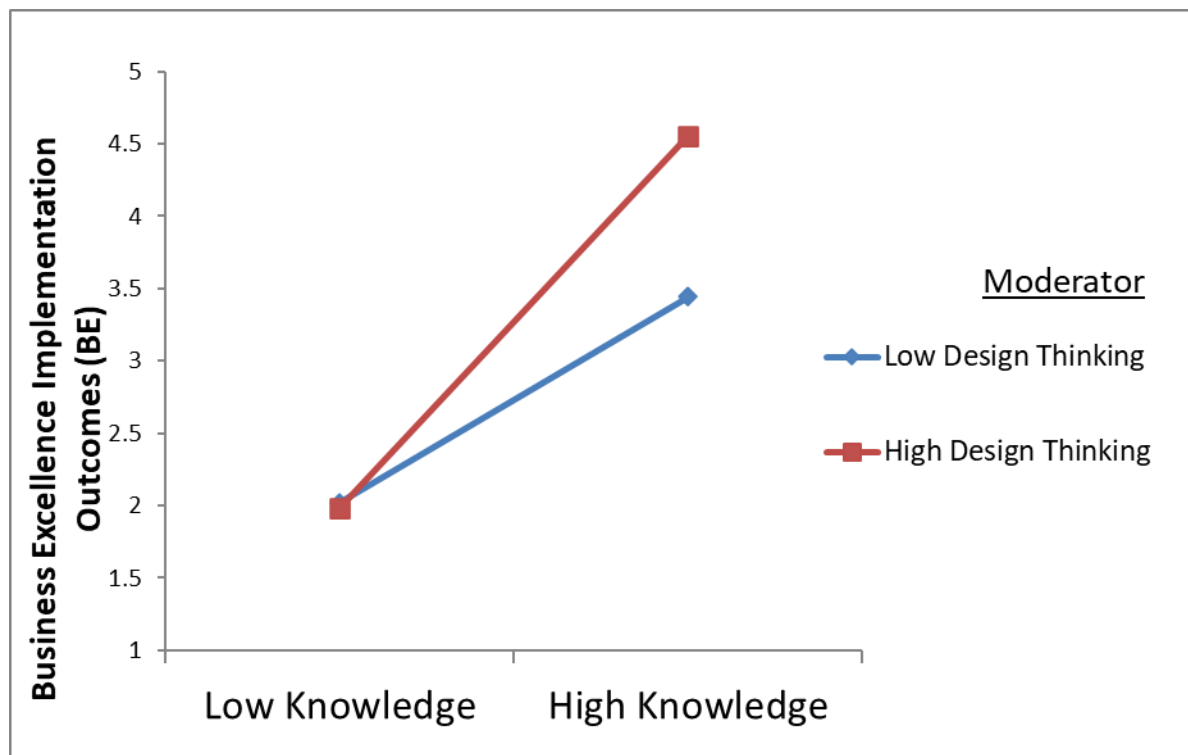


Figure 4. 16 Moderation Effect of Design Thinking (DT) on the Relationship between

Knowledge (K) and Business Excellence Implementation Outcomes (BE)

As shown in Figure 4-20, the two lines indicated a positive relationship between Knowledge (K) and Business Excellence Implementation Outcomes (BE) with the moderation of design thinking. Therefore, hypothesis H6 is accepted.

H7) Design Thinking (DT) moderates the relationship between Action (AC) and Business Excellence Implementation Outcomes (BE)

As shown in Table 4.16, the effect of Design Thinking (DT)'s interaction with Action (AC) on Business Excellence Implementation Outcomes (BE) was not found to be statistically significant at 0.05 level (Coefficient Path = 0.182, T-value = 1.746, p-value = 0.081). This result indicated that Design Thinking (DT) does not moderate the relationship between Action (AC) and Business Excellence Implementation Outcomes (BE). Thus, the hypothesis H7 was rejected. Figure 4-21 shows the graph of moderating effect of Design Thinking (DT) on the relationship between Action (AC) as IV and Business Excellence Implementation Outcomes (BE) as DV.

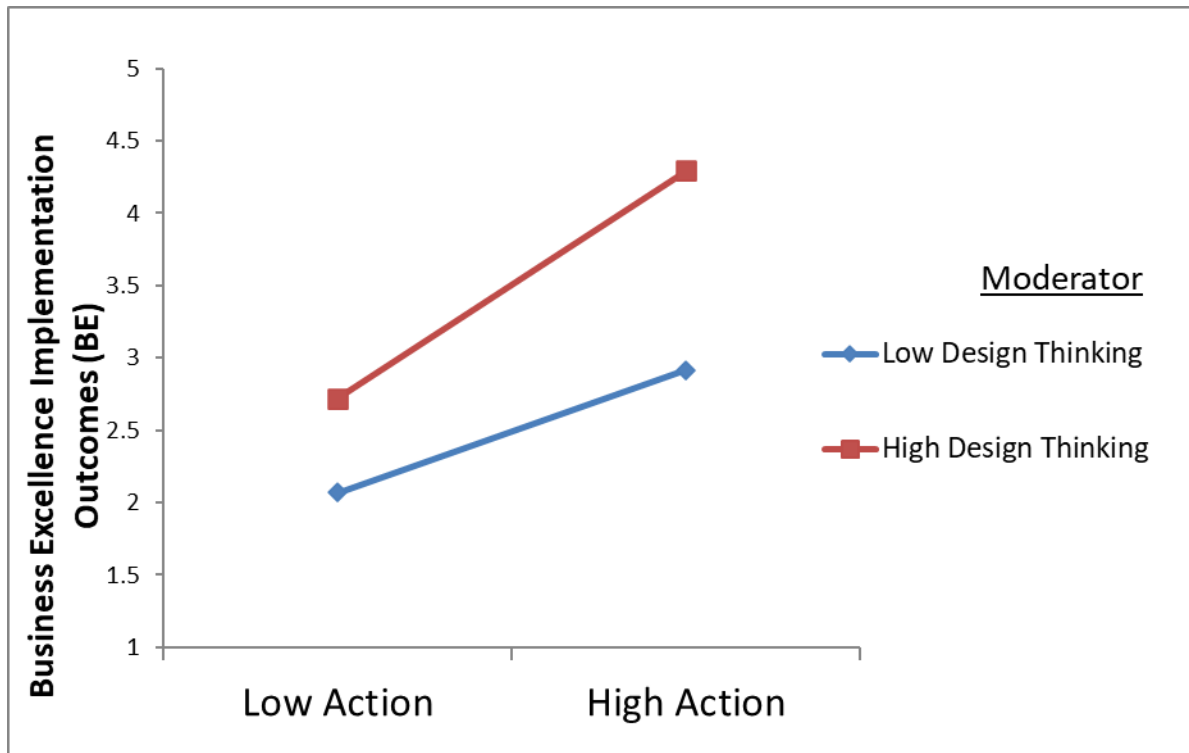


Figure 4. 17 Moderation Effect of Design Thinking (DT) on the Relationship between Action (AC) and Business Excellence Implementation Outcomes (BE)

As shown in Figure 4-21, the two lines indicate a positive relationship between Action (AC) and Business Excellence Implementation Outcomes (BE). The two lines are, however, parallel which indicates the absence of a moderation effect. This relationship suggests that the Design Thinking (DT) does not moderate the relationship between Action (AC) and Business Excellence Implementation Outcomes (BE). It means that with an increase in the level of Design Thinking (DT) as a moderator, the effect of Action (AC) as IV on Business Excellence Implementation Outcomes (BE) as DV will not be affected significantly.

4.9. Summary

This chapter has described the data analysis in two major phases. The first phase involved a preliminary analysis of the data. This process is crucial to ensure that the data adequately meets the basic assumptions in using SEM. In general, the data set of all items was normally distributed and was accurate, without any missing values, and univariate outliers.

The second phase applied the two stages of SEM. The first stage included the establishment of measurement models for the latent constructs in the research. After confirming the unidimensionality, reliability, and validity of the constructs in the first stage, the second stage was developed to test the research hypotheses by developing the structural models.

Accordingly, the two structural models were developed to examine four hypothesized direct effects (i.e., H1, H2, H3 and H4) and 4 hypothesized moderation effects of Design Thinking (DT) (i.e., H5, H6, H7 and H8). These were done by conducting the path analysis using SMART-PLS and testing the significance of the path coefficients for each hypothesized path.

The results indicated that the effects of Attitude (A), Knowledge (K), Action (AC) and Excellence (EX) on Business Excellence Implementation Outcomes (BE) were positively significant. Therefore, the hypotheses H1, H2, H3 and H4 were supported. The most influential factor on Business Excellence Implementation Outcomes (BE) was Excellence (EX), followed by Attitude (A).

Finally, from the results of the moderation analysis, it was found that Design Thinking (DT) positively moderates the effect of Attitude (A) and Knowledge (K) on Business Excellence Implementation Outcomes (BE) and does not moderate the effect of Action (AC) on Business Excellence Implementation Outcomes (BE). The results, therefore, supported the hypotheses H5 and H6 while rejecting H7.

The structural model for testing the direct and moderation effects of the hypothesized variables is summarized in Figure 4-22.

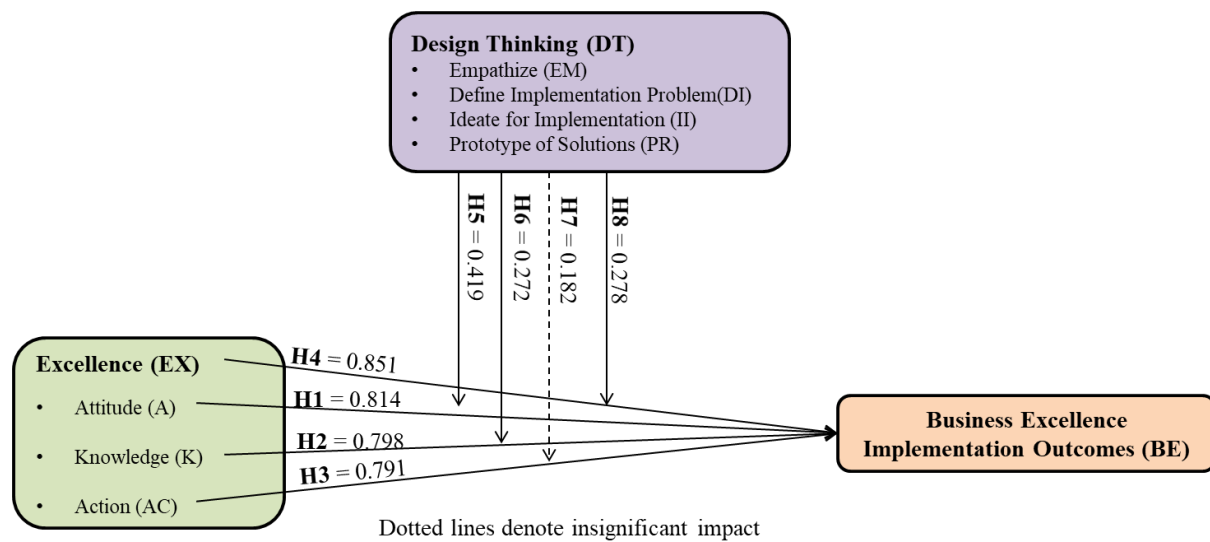


Figure 4. 18 PLS Analysis of the Structural Model for Direct and Moderation Effects

5. Chapter Five: Discussion

Chapter four presented the results of data analysis using Structural Equation Modelling (SEM) and included its suitability to assess the role played by moderators between independent and dependent variables. The chapter described the demographic profile of the respondents as per their gender, job position, and years of experience on the job. It also established the validity and reliability of the questionnaire instrument. Finally, the chapter presented the two models of research relationships which assessed the impact of attitude, knowledge, actions, and excellence on business excellence implementation outcomes while the second assessed the role played by design thinking determinants in this relationship.

The purpose of this chapter is to provide a comprehensive discussion of the questions identified earlier to be answered by this research using the research findings from the data analyses. The chapter consists of four sections. The first section delves into the research objectives and business excellence in the public sector. The second section discusses the descriptive statistics for the research variables (dependent, independent, and moderator variables), while the third section includes a discussion for the results of the SEM analysis and their place in scholarly literature. The final section discusses the contribution of this study with respect to the existing standards of literature.

5.1. Research Overview: Business excellence implementation in the public sector

The primary objective of this research is to investigate the influence of design thinking determinants on the relationship between the independent variables of attitude, knowledge, and action and the business excellence implementation outcomes in the public sector. The literature review has indicated that most of the existing literature has been associated with the

implementation excellence in the private sector with a research gap about the pertinent factors, relationships, and influences of the business excellence implementation in the public sector. Moreover, some of the research conducted in the field of business excellence in the MENA region has indicated that the implementation faced many problems and obstacles (Al-Khalifa & Aspinwall, 2000; Al-Zamany, Hoddell & Savage, 2002; Baidoun & Zairi, 2003; Al-Marri, Ahmed & Zairi, 2007; Zairi & Alsughayir, 2011). All these researchers have highlighted the importance of having a guidance framework for the proper implementation of the business excellence models, in general, and in particular, the countries in the Arab region. As a result, the abovementioned gaps have been identified as an opportunity for the researcher to add value by extending the body of existing knowledge in this field. This enrichment is possible by aligning the attitude, knowledge, and actions with the design thinking in the public sector context and investigating the effects of these variables on the business excellence implementation outcomes.

The fact that there are many internal and external factors affecting the outcomes of business excellence implementation is supported by this research. Internally, the support of the top management is necessary as “excellence starts at the top” while the support and adoption of practices necessary to business excellence is needed on the part of all employees (Al Ghufli, 2012). In other words, the people of the organization need to have a positive attitude towards business excellence requirements, and have to possess the knowledge and ability to perform excellence requirements, which can make it possible for them to take the actions needed for implementation which means the actual performing of the requirements.

This research results show that the attitude, knowledge and action of the employees are positively affecting the excellence implementation outcomes. The results of the correlation, as well as the SEM analysis both suggest that design thinking is strongly associated with the business excellence

outcomes and its factors. This is in line with Aladwan and Forrester (2016)'s findings who reported that an organization's business excellence would imply a strong commitment by its leaders and managers to the continual improvement of all main processes, innovation, and creativity, working conditions, team cohesion, level of engagement and overall organizational culture. With knowledge, attitude, and actions all playing vital roles in all these processes, the findings support the role played by leaders and employees.

Furthermore, Zdrilić and Dulčić (2016) have also indicated that excellence begins with the employees' dedication to produce results without revision, readiness to take accountability, continual learning, progress, and clarity in everything they do. This is why their attitude, knowledge, and actions are directly related to the outcomes associated with excellence. Santos *et al.* (2018) have also indicated the need for leaders' involvement in operationalizing business excellence outcomes by establishing clear goals and outcomes, communicating results, galvanizing the employees to share knowledge and develop ideas together, bringing transparency and objectivity in work processes and evaluations, maintaining dynamic ideas for the betterment of the organization, and recognizing good actions.

Recent studies continue to show the importance of knowledge in achieving business excellence. In a study of systematic literature review of all research published between 1995 and 2015 on the subject of business excellence, it was noted that successful implementation of business excellence required the introduction on operational models within the firm which kept all processes aligned and kept intellectual knowledge contained within the employees functional and accessible (Hussain, Edgeman & Eskildsen, 2020). Such implementation of quality models with aligned knowledge throughout organizational processes was significant as it kept the information flow moving in both upward and horizontal directions. Furthermore, the cumulative knowledge of the

twenty-five studies chosen by the researchers as being the most relevant in studying the impact of knowledge structures on business excellence indicated that focussing only on tangible knowledge could not be sufficient. Tangible resources like developing the technical prowess and building sophisticated knowledge and processes could not work much unless they were complemented by intangible, soft resources of organizational values and an assimilative organizational culture.

In general, organizations need to sustain their excellence by maintaining their stakeholders' happiness which was a part of the excellence implementation outcomes measured by this research.

In order to ensure that stakeholders remain satisfied and aligned with the organization's goals, excellence needs to involve the employees. Furthermore, as per Zdrilić and Dulčić's (2016) contention, the notion of excellence implies that what organizations are performing effectively today should be performed even better and more effectively tomorrow, particularly, in comparison with the competition to satisfy all interest groups completely. This can be achieved by having a mature excellence framework which is only possible when the employees possess a high level of positive attitude, the right knowledge, and the ability to perform excellence requirements and take the right actions related to the actual performance of the needed requirements. All these indicators show that attitude, knowledge, and actions are indeed critical to the achievement of business excellence implementation outcomes.

There is further indirect evidence for the need to involve the employees actively to achieve business excellence implementation outcomes. The basic concept behind business excellence is that the outputs are not relying exclusively on the organization's goods and services but rather extending into broader areas which require a balanced focusing on different aspects of organizational management and resources' allocation with a special focus on the human resources who are the main tools and instruments for the target of excellence (Escrig and de Menezes, 2015).

In order to make sure that attitude, knowledge, and actions of the employees can be influenced towards the achievement of business excellence outcomes, managers have to start from effective planning and identification of the desired results in each business component, organizing the capabilities of their employees, and managerial approaches to achieve the desired results, deployment of the plans and continual assessing and refining of the documented plans based on the implementation results (Lasrado & Gomiscek, 2017).

If these requirements are matched to the business excellence models, it can be seen that all three independent variables of attitude, knowledge, and actions can be targeted through those models effectively. In fact, the combined effect of all three variables together, as embodied in the excellence variable is also achieved through a business excellence model. In effect, this study and those before it support that the models of business excellence reflect a systematic, organized, and more sustainable approach to change, which is an organized plan to attain business excellence gradually (Al Ghufli, 2012; Escrig & de Menezes, 2015; Adamek, 2018).

There is not much surprise in the realization of this result. In reality, the tenets of aligned attitude, knowledge, and actions of employees should be ingrained in the organization's management philosophy or, in other words, excellence should be the fundamental principle of the management of the organization. This is amply demonstrated in organizational behaviour and management studies where all managerial actions are expected to align the entire organization towards the same goals while performing critical roles all pointed towards the attainment of the same strategy. If the principles of good management are planned and applied, the outcome will be a good performance. This essential building block of management has been in practice since the times of Henri Fayol and Henry Ford and continue till today as managers strive to make their organizations flexible, ready for change, and agile. As a result, the findings of this study, in essence, support the notion

that the organizations have to be brought closer to the concept of excellence in results which, in effect, can be deemed a synonym for business excellence outcomes.

Furthermore, performance quality is synonymous with a unified approach to organizational performance management resulting in continually enhanced principles being delivered to the consumers and the stakeholders, thus, leading to organizational success, increased overall operational productivity and capability, as well as, operational and individual learning (Abbeh, Ngige & Azuka, 2019). An organization's success is dependent on the employees' expertise, abilities, ingenuity, and motivation to a large extent. Human ability is best expressed by shared ideals underpinned by a culture of trust and support. This is why the employee appraisal is the core feature of the Excellence approach and should involve the critical components of attitude, knowledge, and actions. Consequently, by implementing business excellence in an organization, the managers can expect to achieve all these benefits provided they are able to unify the organization and its employees in the future goals and strategic direction.

Business excellence is described as an organization's attainment of a high level of maturity with regard to the management and achievement of the results. Truly excellent organizations are those entities that aim to please their stakeholders with what they are accomplishing, how they are accomplishing it, and what they will accomplish (Mele & Colurcio, 2006). The assurance that the results achieved will continue in the future to achieve the required level of corporate performance, equal value should be given to both non-financial and financial metrics of success rather than relying exclusively on the financial viewpoint. Such a holistic emphasis is possible only when an organization is able to implement the principles of TQM, or the business excellence models in its functioning.

Having seen that the independent variables of attitude, knowledge, and actions are significantly related to business excellence and perceived the support from scholarly research for their significance, it is important to understand how they can be implemented through a business excellence framework. This implementation, as per the literature review, is best achieved by choosing a business excellence model. The assessments for an organization's excellence performance against the business excellence model's criteria which identify the outcomes of the implementation can give the public sector organizations a valuable benchmark to build on their strengths while drawing a road map for improvements by identifying the areas for improvements to reach their individual best level of performance. By mapping progress against the criteria of a business model, the organization's position on the scale of excellence can be assessed objectively, while also making it possible to expose the weaknesses and strengths of the organization (Zdrilić & Dulčić, 2016). The areas for improvements found are a valuable source of information required for change and can be used as a guiding force for the next stage of organizational development. This is particularly important for the public sector which may not have a robust and responsive mechanism to identify changes as their customers are relatively stable when compared to the private sector which handles clients influenced by international and more dynamic factors (Gonzi, 2019).

Business excellence models are an extension of TQM's fundamental values and ideals which are made possible through modelling methods for evaluating organizational success in the process of business excellence implementation. In essence, business excellence is an advancement of TQM as long as it is based on the same principles, that is, if its definitions are comparable (Mele & Colurcio, 2006).

Finally, the business excellence models, specifically, the MBNQA and EFQM have also found support in this study. The core principles of leadership, strategy, customer focus, integration, workforce practices, operations, and attention to results as embodied in the MBNQA and reflected in this study's questionnaire items have found support from the respondents. Similarly, EFQM's criteria of leadership, people, strategy, partnership and resources, processes, products, and services, results for customers, people, and society, and the business have been ratified by the responses received for the individual items that make up the scales for the variables.

With respect to the other aspect of this research, that is the exploration of the role played by design thinking as a moderator between the attitude, knowledge, actions, and excellence, with business excellence implementation outcomes, the results were mixed. First, design thinking moderates the relationship between excellence and business excellence implementation. This is an important finding as literature review also showed some evidence of commonalities between the principles of design thinking and business excellence suggesting that these variables should be associated. Furthermore, design thinking was found to be a significant and positive predictor of business excellence implementation and attitude but not a predictor of actions and business excellence implementation. Knowledge was also found to be significantly related to design thinking determinants as moderators of business excellence implementation. As a result, the lack of moderation showed by design thinking between Actions and business excellence implementation need further exploration. All these components are further discussed later.

5.2. Findings of demographic analysis

As the respondents in this study were selected through convenience sampling, the demographic analysis were checked for normality of data to ensure they mirrored the real distribution of these demographics well. First, the distribution of gender for this research was (83% male, 17% female)

which found to be close to its distribution in the study population which are the senior managers and leaders of the Dubai government sector. 77% males and 23% females were also reported to form the sample of a Dubai Statistics Centre study and reflect the reported statistics at the DGEP website (Dubai Statistics Centre, 2013; Dubai Government Excellence Program, 2019). Therefore, the research sample is believed to reflect the gender distribution well and show remarkable similarity to the public sector in Dubai.

When considering the distribution of the participants' years of experience, the sample represents all the identified categories in a way that support the diversity of managerial positions in Dubai public sector organizations. As all experiences are included in the respondents' sample, the study has benefitted from novice, as well as highly experienced managers. With ten respondents possessing 1-5 years of experience and twelve representing more than twenty years of experience working in the public sector, this study has benefitted from a range of perspectives.

Furthermore, in reporting the level of education for the sample, four categories of educational qualifications were included from below graduation, graduation, Master's and doctorate degrees. Considering the nature of the job in public sectors, 5.7% of respondents have a doctorate degree, 67.4% of respondents reported themselves as being graduates while 23.4% possessed a Master's degree. There were also five undergraduates with 3.5%, which show that the public sector does allow rising through the ranks for their employees. Finally, the job positions of the respondents in the sample included only two options of managerial positions and leadership roles. 90.1% respondents identified themselves as being managers while nearly 10% were leaders or top managers as implied in public sector organizations in Dubai as per field observations. This measure of keeping the sample restricted to the managerial positions was taken as business excellence and its factors require a mature perspective with an experience of making other employees follow

directions and an ability to visualize the way their followers' attitude, knowledge, and actions affect the meeting of goals and strategies.

It is important to add the results of the correlation analysis of demographic variables with the study variables. Only gender was found significantly related to excellence, knowledge, actions, and design thinking but negatively. The other demographic variables of educational qualifications, length of service, and position were not found to be significantly linked to any of the variables.

To summarise, the sample selected for this study has reflected the distribution of public sector managers in Dubai's public sector organizations well. The choice of a convenience sampling procedure has been confirmed through normality distribution to ensure that it captures a mini representation of the kind of employees who work in this sector. This representation is important as it directly affects the normal distribution of their responses and hence, the generalization of the findings.

5.3. Findings from the Questionnaire Items

The central measures of tendency helped in understanding the responses to the scales individually. The frequencies of the respondents' answers to the 52 questions which were ranked on a Likert scale of seven ratings where a score of 7 represented strong agreement and a score of one reflected strong disagreement. Among all variables, the highest observed value of Mean was seen for Business Excellence Implementation Outcomes (BE) with a Mean value of 6.564 and a standard deviation value of 0.695. This scale showed that the respondents believed that all three measures of attitude, knowledge, and actions were necessary for business excellence implementation. As a combined measure, Excellence has more intuitive value for the respondents who feel that business excellence implementation will be higher when all three measures are combined.

This value was then followed by the variable of Attitude (A) which was measured as a combined expression of the employees' attitude, knowledge, and actions. With a Mean value of 6.387, and a standard deviation value of 0.775, the respondents were the second most positive for Attitude scale's items. Among the items considered to be highly important by the respondents were possessing a positive attitude towards business excellence implementation outcomes (Tickle, Mann & Adebajo, 2016), the embeddedness of the requirements in the daily tasks (Lasrado & Gomiscek, 2017; Escrig-Tena, Garcia-Juan & Segarra-Ciprés, 2019), the support of the leaders (Krajcsák, 2019; Sternad, Krenn & Schmid, 2019), and a feeling of comfort with risk taking (Andersen & Jessen, 2007).

The next highest recorded Mean value was for Actions at 6.350 and standard deviation value of 0.882. This opinion showed the strong agreement of the participants that the public sector employees in all levels need to take the actual actions needed to perform the excellence implementation requirements. It is useful to mention here that the actions included in this scale were related to the inclusion of stakeholder feedback in building the organisational culture, organizational support for employees, taking decisions at the strategic level, making actions a daily part of work, having a supportive IT infrastructure, supportive organizational structure, having a rewarding scheme, and a steering committee to guide the business excellence implementation. It is also important to mention here that these aspects of managerial and organizational actions were derived to make the scale from existing literature, therefore, the support of the respondents further indicates that their inclusion was correct (Ferdowsian, 2016; Tickle, Mann & Adebajo, 2016; Androniceanu, 2017; Lasrado & Gomiscek, 2017; Stoyanova & Iliev, 2017; Lasrado, 2018; Abubakar *et al.*, 2019; Jabnoun, 2019; Nizamidou & Vouzas, 2020).

Among the last three rated scales in the variables, it was design thinking and its determinants which featured lower. Design thinking's determinant, prototype of solution, which was rated at a Mean value of 6.235, and a standard deviation value of 1.22 was the lowest rated. This opinion reflects the agreement of the participants that in the public sector organizations, the ideas and initiatives that are defined as a solution for business excellence requirements' implementation are planned and prototyped to be experimented and tested. Again, while measuring this variable, the lower rated items were the experimentation of new solutions before their implementation and the promotion of risks even at the cost of more mistakes. Both these items suggest the need for resources and top management's support which is difficult especially when dealing with public funds and higher accountability.

The empathy of the implementation problems was second place from the bottom among all variables with a Mean value of 6.25 and a standard deviation of 1.17 which reflects strong agreement of the participants that the organizations in the public sector are empathising with the initiatives and ideas from all concerned for business excellence implementation problems. As expected from the public sector organizations, the item asking about leaders understanding the employees' point of view was low. Furthermore, understanding the excellence implementation outcomes and their employees by the leaders was also rated low showing that this is an area which needs further attention from the management.

The define implementation problem was rated third lowest at 6.30, and a standard deviation of 1.11. This opinion shows that in the eyes of the respondents, the public sector organizations' definition of the excellence implementation problems by gathering the needed information from the right resources was not considered to be an important exercise. Further insight into the reasons why this determinant was not considered to be as highly critical as the other measures is provided

by reflecting on the individual items of the scale. First, the reformulation of initial problems when faced with a business excellence implementation issue is a tough measure as it requires a bureaucratic organization to revisit the problem from the start and brainstorm about defining it better. This is probably why the item has not received as high scores as the others. Secondly, the managers who formed the sample of this study have also rated the item enquiring about seeking of new opportunities to implement business excellence lower. This score can be attributed to the perceived need for more innovative, creative, and out of the box measures suggested for improving business excellence in the organization.

5.4. Findings from Correlation

The results of the correlation showed that all variables were strongly correlated with each at a significance value of $p < 0.00$. The effect sizes of all relationships were identified to be strong. These findings showed that not only are attitude, knowledge, actions, and business excellence implementation outcomes strongly associated with each other showing their importance in meeting excellence outcomes; even design thinking is strongly correlated with them. These findings are a strong encouragement for the researcher who developed the framework linking business excellence outcomes to design thinking.

5.5. Prerequisites of SEM Modelling

The relationships between the independent, moderating, and dependent variables were assessed using the Partial Least Squares (PLS) technique. This analysis proceeded in a two-step process which is considered to be beneficial for establishing the reliability and validity of the models further (Ahmad, Zulkurnain & Khairushalimi, 2016). The first step involves the analysis of the measurement model while the second step tests the structural relationships among the latent constructs. Establishing the construct validity of the SEM models is a critical prerequisite as it is

one of the advantages offered by this form of analysis over others. In this study, two sub-categories of construct validity namely convergent and discriminant validity were assessed. Convergent validity assesses the similarity in the variance of scores of items that measure the same construct (Lowry & Gaskin, 2014). In order for a model to be deemed accepted, factor loadings (standardised regression weights), Average Variance Extracted (AVE), and construct reliability (CR) among sets of items in the scale measuring the construct are evaluated. The factor loadings have to be above a threshold of 0.5 for convergent validity to be considered to be fulfilled (Hair *et al.*, 2012). Furthermore, dividing the sum square of the standardised factor loading by the factor loading number gives the AVE which should also be noted to be above 0.5. The construct reliability is measured from the square sum of factor loading and sum of error variance terms for a construct. Lastly, the internal reliability was measured through the Cronbach's alpha values which were observed to be above the threshold of 0.7 in all scales. Therefore, these reliability measures ensure that the SEM model is appropriate for use in this study's context and its findings can be generalized to the study population.

Furthermore, the discriminant validity which measures the distinctness of each study construct in the model is important for ensuring that the study measures relationships between unique constructs and not different aspects of the same question. Discriminant validity is established by comparing the square root of the AVE for two constructs and their correlations in which case the correlation between the two constructs should be smaller than square root values of AVE and equal to or lower than the value of 0.9 (Henseler, Ringle and Sarstedt, 2015). The discriminant validity, in this case, will establish that the research variables are separate, distinct entities and hence, show a significant or non-significant impact on the dependent variables. It is only when this discriminant

validity is combined with the reliability of the model, that the researcher can claim to have made significant findings which add to the existing knowledge and practice in the research field.

As a result, the SEM models in this study were first assessed for their convergent and discriminant validities before estimating their significance. The reliability of the instrument was already established.

5.6. Findings of SEM Modelling

The SEM models were assessed using the value of R-squared (R^2) which represents the portion of variance in the dependent variable as explained by its predictors. This value should be above 0.30 as recommended by Zhang (2009). In addition to estimating the magnitude of R^2 , SEM models now also include predictive relevance as developed by Stone (1974) and Geisser (1975) as additional criteria for model fit assessment. This technique represents the model adequacy to predict the manifest indicators of each latent construct. Stone-Geisser Q^2 (cross-validated redundancy) was also computed to examine the predictive relevance using a blindfolding procedure in PLS. Following the guidelines suggested by Chin (2010), a Q^2 value of greater than zero implies the model has predictive relevance. With these criteria, the SEM models were evaluated to ensure that the research questions were answered while following criteria which are well established in the research field (Zhang, 2009; Woody, 2011; Lowry & Gaskin, 2014; Ahmad, Zulkurnain & Khairushalimi, 2016).

SEM models when used for establishing the applicability of hypotheses use parameter estimates and coefficient values. As discussed in the third chapter, bootstrapping has emerged as a better alternative to the Sobel test which used 't' values which were low on power and provided more conservative estimates (Lowry & Gaskin, 2014). Moreover, the results from the Sobel test showed a positive skewness for small estimates. As a result, bootstrapping which is recommended by

researchers for its advantages of controlling type 1 errors and working with data that is not perfectly distributed in normal distribution, or in other words, data found in social sciences studies, was used for running the SEM models (Ahmad, Zulkurnain & Khairushalimi, 2016). Bootstrapping makes the observations come to terms with their replacements for thousands of times while calculating for resampling which allows the researchers to calculate the parameters which help identify significant relationships.

The next important consideration before researchers employing the SEM modelling is developing the research model to be tested. For many studies, this model emerges from existing theory with previous studies having established independent variables and the considerations of the influence. However, as most studies aim to assess a new relationship rather than replicate previous works, many researchers choose to develop their own research models. This is also the case for this study which has used the existing theoretical framework's evidence for link between business excellence implementation outcomes and attitude, knowledge, and actions of employees while also adding the possible moderating influence of design thinking determinants of empathy, definition, ideation, prototyping, and testing of solutions in an explorative model. This makes the operationalization of the constructs an important basis for the usefulness of the SEM model for future researchers and the existing body of knowledge (Hair *et al.*, 2012). In fact, it fits the pragmatic research philosophy of this study.

5.7. Attitude, Knowledge, Action, Excellence and Business Excellence Implementation

The Confirmatory Factor Analysis or CFA conducted for assessing the influence of the independent variables of attitude, knowledge, actions, and excellence on business excellence implementation was conducted using the responses of the 141 respondents on the 24 items. The factor loadings for the scales of attitude, knowledge, and actions showed that certain items were

not supported by the responses. K8, which states that “In my organization, the right capabilities are present to implement excellence requirements”, fetched a factor loading of only 0.382 which is much below the value of 0.5. As the questionnaire consists of 52 items, the removal of this item was believed to not have much of an impact on the final results. In fact, the opinions of the respondents were considered to be an important indicator of the sentiments of the respondents and an important finding in its own right.

It should be noted here that factor K8 explored the opinion of the respondents about presence of right capabilities within the organization to take care of the business excellence implementation outcomes. Still, the respondents believed that this statement about business excellence requirements was not a valid consideration.

Having considered the low rated items as per the factor loading, it is necessary to mention the items which rated the highest. A3 in the scale of attitude had the highest factor loading at 0.886. This item stated that the organization excellence implementation requirements are an additional workload. The item was reverse coded while entering data. This simple statement sums up the relationship of attitude to business excellence implementation and is also supported by existing literature (Haffer & Haffer, 2015). In a study of award winning Australian companies practising business excellence framework in Australia, it was noted that several challenges presented as time passed (Brown, 2013). These challenges included dwindling leadership support, difficulties in maintaining consistency and drive among employees, and keeping the excellence framework meaningful for employees. All these challenges could be addressed by working towards building positive attitudes and maintaining them. Therefore, business excellence not posing as an additional workload is a positive indicator.

Within the Knowledge scale, the highest factor loading was observed for K1 (0.907) which states that “In my organization excellence implementation requirements are an additional workload”. This statement too was reverse coded. It stands to reason that employees did not feel business excellence requirements to be an additional load either as an attitude or as a knowledge requirement. This clarity in communication about excellence requirements, the associated performance targets, and quality standards is also supported by other studies. Earlier research has shown that organizations that successfully implement business excellence invest in information technology-enabled communication systems that allow them to maintain clarity of purpose, engagement, and consistency within the employees (Androniceanu, 2017; Kassem *et al.*, 2019). In a study of 189 automobile part manufacturing companies, it was reported that the application of advanced manufacturing technology actually leads to better group communication which facilitates group communication, and hence, business excellence (Ghobakhloo & Azar, 2018). Therefore, the role played by communication systems in building knowledge within the organization, as with sharing it, has a lot of evidentiary support.

In the Action subscale, the factor loadings were observed to be ranging from 0.7 to 0.91. Though items of the subscale resonated among the respondents, the scope of the items included for this subscale was the widest beginning with the inclusion of supervisory feedback in organizational culture (AC1) to supporting employees in policy (AC2), decision-making occurring at strategic level (AC3), actions for business excellence being part of daily routine (AC4), support of IT systems (AC5), supportive design of organizational structure (AC6), an aligned reward system (AC7), and an excellent steering committee (AC8). All these measures also have the support of existing research (Mele & Colurcio, 2006; Tickle, Mann & Adebajo, 2016; Androniceanu, 2017; Escrig-Tena, Garcia-Juan & Segarra-Ciprés, 2019; Kassem *et al.*, 2019; Hussain, Edgeman &

Eskildsen, 2020). The highest value was observed for AC3 (0.934) which stated, “In my organization the decisions are taken at strategic level to fulfil business excellence requirements”. The AVE values for all three scales were much above the threshold value of 0.5. This comparison established the reliability of the measures. Furthermore, the discriminant validity of the scale was also established as the inter-correlations between two of the constructs were observed to be below the threshold value of 0.9 set as per (Henseler, 2015). Secondly, the values were lower than the square root of the average variance extracted by the indicators, demonstrating good discriminant validity between these factors. As a result, the present model was considered to be reliable and valid having passed the threshold values as prescribed in literature (Hair, Sarstedt and Ringle, 2019; Benitez *et al.*, 2020).

The second step in the SEM analysis assessed the measurement of structural model of the relationships between the constructs. This step evaluates the structural model by focusing firstly on the overall model fit, followed by the size, direction and significance of the hypothesized parameter estimates which are depicted through path diagrams presented in the last chapter. Structural models are assessed using four main criteria of variance explained (R^2), effect size (f^2), predictive relevance (Q^2) and path coefficient (β), all of which are used to estimate whether a hypothesis can be deemed to be proven or has to be rejected.

5.8. Excellence and Business Excellence Implementation Outcomes

The direct effect of excellence on business excellence implementation outcomes was found to contribute to 72.5% of the variance in the scores. Considering that Zhang (2009) recommends a cut-off limit of 0.30 and Chin (1998) R^2 value of 0.67 is believed to be substantial, 0.33 is moderate, and 0.19 is weak. As a result, this R^2 value signified a substantial level of influence. Furthermore, the value of Q^2 was noted at 0.499 which showed that the direct relationship between these two

constructs has acceptable fit and high predictive relevance. With a significant ‘p’ value and a path coefficient of 0.851, this result showed that hypothesis H4 which predicted a positive influence of excellence on business excellence implementation outcomes was accepted and proved.

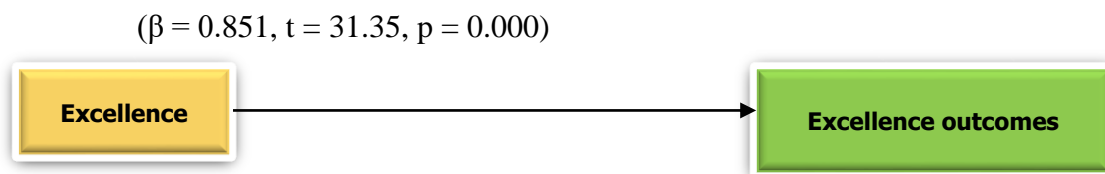


Figure 5. 1 Direct Effect of Excellence on Business Excellence Outcomes

The results above show a positive influence of the excellence (attitude, knowledge, and actions) on the business excellence outcomes and this relationship is significant as the p value is less than 0.001. This result indicates that as excellence maturity increases, business excellence outcomes tend to increase. As a result, increasing the level of excellence maturity in the public sector organizations will lead to increase in the outcomes of excellence implementation. This result is in line with earlier studies like Andersen and Jessen (2007) who measured the relationship between attitude, knowledge, and action together in the project management maturity level.

The results, therefore, show that excellence has high predictability for improving the implementation outcomes from business excellence framework for public sector organizations. This is an important finding as no studies which have linked these constructs in the context of public sector could be identified in the literature review. Moreover, in other studies of business excellence, the evidence in support of excellence is not direct. For instance, studies discuss how the business excellence implementation in public sector is of benefit but with no empirical analysis to back the fact (Talwar, 2011; Wen *et al.*, 2016). Studies do indicate that business excellence is of immense use for organizations but do not indicate how they can implement it (Mann, Adebajo

& Tickle, 2011; Mann, Mohammad & Agustin, 2014). Moreover, existing literature describes the establishment of business excellence models for public sector but have not shown how they can be of use in improving organizational outcomes (Marwa & Zairi, 2008; Hasan & Hannifah, 2013; Shrouty & Tiwari, 2017). Therefore, this result is of great significance in the study context.

5.8.1. Attitude and Business Excellence Implementation Outcomes

The Hypothesis 1 which said that attitude is positively linked to the business excellence implementation outcomes has been supported by the SEM model. The 'p' value at 0.000 was lower than the prescribed value of 0.001 making this relationship a significant one. Furthermore, the 't' value of 19.297 and path coefficient in 0.814 were noted. As a result, this hypothesis is accepted, and attitude is found to be positively linked to business excellence implementation outcomes.

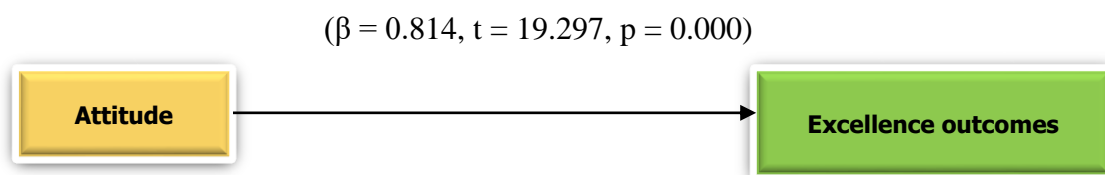


Figure 5. 2 Attitude with business excellence outcomes

The implication of this result is that increasing the positive attitude toward excellence implementation among the public sector employees will improve their willingness to perform the requirements, which will lead to an improvement in the outcomes of the excellence implementation. As attitude of employees can be influenced through organizational policies,

practices, leadership, and rewards, this relationship has a lot of value for organizations looking to improve their business excellence outcomes.

Attitude of employees has found a lot of support in existing literature. First, it is directly linked to the willingness of the employees to follow the requirements (Andersen & Jessen, 2007). Secondly, Haffer and Haffer (2015) have noted that attitude can determine the way employees implement business excellence and its influence on the market performance of the organizations. Third, Breaz (2019) has mentioned that employee attitude affects the way employees agree or disagree with the organization and their leaders' intentions and goals which affects the way they perform their tasks. When employees possess a positive attitude towards business excellence implementation, they are more likely to strive for continual improvement, work for innovation and creativity, be better team members, and build a positive organizational culture (Aladwan & Forrester, 2016).

An important point favouring attitude's influence on business excellence implementation is that business excellence is the simultaneous satisfaction of all stakeholders which is possible only when employees are instilled with the attitude to provide customer delight, management by facts, and focus on employees or follow a human-centred approach (Kanji, 2002). Another important point illustrated in literature has been that employee attitude is very relevant to business excellence as it is one of the only factors that can truly make change management sustainable (Douglas & Vora, 2013). This is an important evidence for employee attitude's relevance in business excellence implementation.

In a case study of four organizations implementing idea management system, it was noted that among the other critical success factors, attitude played a significant part in keeping leaders and employees proactive towards possible issues that may affect operations (Santos *et al.*, 2018). This study is important in indicating that attitude alone may not be critical or as effective to making a

difference in the business excellence outcomes as it can be when combined with other variables. Some such critical success factors identified in this study included the support and commitment of the top leaders so that they keep energizing the hierarchical levels below them, using the evidence of results so that the entire organizations' workforce remains dedicated and motivated to keep applying themselves for meeting the requirements of business excellence, establishing goals, objectives, and key performance indicators so that the motivated employees know exactly what they need to do to achieve the business excellence requirements, sharing of results with the workforce and other stakeholders so that the motivation keeps running high, showing them what they are doing well and which areas need further improvement, keeping transparency in the decision-making so that talent remains committed to the changes required to meet the continuously evolving requirements, and using recognition to motivate and guide employees. This comprehensive list of critical success factors can be visualized in the form of essential steps needed to achieve the proactive and dynamic attitudes which will be built in the employees, the leaders, the top managers, and hence, into the investors and customers.

Earlier studies have also indicated that attitude needs to be positioned well within existing systems and processes so that the organization can derive the maximum benefit from it. Kanji (2008) who has suggested an excellence management system in two parts has explained a comprehensive system for channelizing attitude. Part A is about leadership which is operationalized through a set of principles and core concepts which lead to performance excellence. In this system, managers need to be melded to promote four principles in the marketing function to achieve business excellence implementation outcomes (Kanji, 2008). These four principles include aiming for customer delight, managing by facts, engaging in people-based management, and making continuous improvement an organizational value. In order to meet these four principles, core

concepts are further developed. These core concepts include a “customer focus, process improvement, people performance, and a culture of continuous improvement” (Kanji, 2002). Part B, on the other hand, focusses on organizational values which are operationalized into process excellence, organizational learning, and delighting the stakeholders which are again connected to performance excellence. Therefore, Kanji (2002; 2008) has explained how attitude needs to be connected to leadership and organizational values for them to meet the business excellence requirements.

As a result, the positive and strong relationship between attitude and business excellence is a beginning trend which should be supplemented with other critical success factors as indicated by existing and emerging research so that the motivated and committed employees can be told what they need to do and how they can do it to make a real difference to business excellence outcomes. Furthermore, business excellence implementation does not occur at a single level which implies that modern complex organizations need to ensure that individual attitudes are communicated through to cross-functional, departmental, and across industry teams.

5.8.2. Knowledge and Business Excellence Implementation Outcomes

Knowledge was found to be positively and significantly related to business excellence implementation. Hypothesis 2 was supported by the SEM model ($\beta = 0.798$, $t = 24.825$, $p = 0.000$). With ‘p’ value lower than 0.001, the findings supported the result that there is a strong positive relationship between knowledge and excellence implementation outcomes. This result means that increasing the knowledge about the requirements of business excellence implementation, as well as a better understanding of the whole picture will develop the ability to perform different requirements, which, in turn, will lead to an increase in the outcomes of excellence implementation.

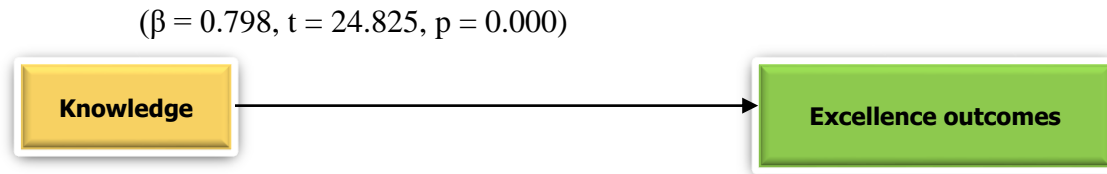


Figure 5. 3: Knowledge and business excellence outcomes

This result is also well-supported by existing scholarly research. This result is in line with the popular management theory that says an organization must view people as their most valuable assets in the current era of knowledge workers making it easier for them to continue to develop with organizational needs (Bou-Llusar *et al.*, 2009; Armstrong & Taylor, 2020). It is also in line with the findings of Roberts (2014) who said that it is a key issue for any organization operating in a highly competitive and globalized world to achieve business excellence and optimize the use of organizational assets.

Andersen and Jessen (2007) have noted that the knowledge and the project management maturity level are positively related. Recent studies posit that knowledge creation, sharing, and development are all related to the achievement of a competitive advantage for the firm by directly contributing to its productivity, innovation ability, and hence, survival (Obeidat, Al-Suradi & Tarhini, 2016; Bolisani & Bratianu, 2018). Furthermore, it has been reported that assessing the level of knowledge and understanding about business excellence requirements among the employees can help the organization to achieve its desired outcomes (Gong, Zhou & Chang, 2013).

Apart from studies which have linked knowledge directly to business excellence implementation, the research focus on knowledge sharing and development has seen a steady increase in interest from both researchers and practitioners (Hashim, Osman & Alhabshi, 2015; Mardani *et al.*, 2018). Studies show that knowledge management can affect creativity, service delivery, and customer

delight and loyalty, all of which are critical outcomes for organizations (Kryscynski, Coff & Campbell, 2020).

Other benefits of this important relationship are that it is easier to influence knowledge than attitude as employees can be made aware of the requirements of excellence, standards of performance, their own performance against the set targets, and further improvements needed to achieve the excellence implementation outcomes. Shahi (2017) says that improving employee awareness, increasing and optimizing their abilities, capacity and willingness to grow, and evolve can all work towards building employee knowledge which can help achieve the required outcomes. Knowledge management is an important consideration for modern organizations in its own right. It is linked to the human capital development which will improve the available skills in the organization and ensure that continuity in quality of services is maintained (Roberts, 2014). Investing in knowledge management is of immense use to organization as it allows them to bring in creativity and sustainability of their operations which build profitability and a competitive advantage (Alraouf, 2016; Cohendet, Parmentier & Simon, 2017). Consequently, it is not a surprise that knowledge has been found to have a direct impact on business excellence implementation outcomes.

Despite this importance of knowledge, organizations often ignore or underestimate the role people may play in boosting results with other factors given precedence which contributes to a negative performance. Merely taking the results of studies which focus on such organizations that have received awards for the implementation of business excellence as in the case of a study which conducted case studies of six Australian firms which had won awards in business excellence cannot show the complete picture of how knowledge and business excellence connect in those organizations which are making a beginning in this field (Gloet & Samson, 2017). In this study,

knowledge was found to be an important part of business excellence. By offering a knowledge management frame, all six awarded organizations had managed to improve their innovation performance. The researchers noted that this success was attributed to the relation between knowledge management and consistent changes towards improved performance which made it possible for these firms to offer incremental innovation. This is an important point which should be noted by future researchers that business excellence is a useful tool for aiming for incremental innovation. Organizations which succeed in implementing a robust business excellence framework may even be successful in achieving radical innovation but that should not be the first aim of the exercise.

It is important that the positive and significant relationship between knowledge and business excellence is used for encouraging organizations to adopt the framework as studies with regular firms continue to show that business excellence is not implemented by most managers who are unaware of the potential of the framework (Centobelli, Cerchione & Esposito, 2019). In this study on suppliers, the researchers noted that the owner-managers were reluctant to use information technology and new frameworks which made them limit their use of knowledge to storage and transfer of data. This result is an indicator of how firms, which are not information technology-based, may find their managers to be reluctant to enhance their knowledge management to actual creation and sharing. Studies in the public sector of Dubai which have focused on identifying their knowledge management implementation and its connection to organizational performance have also indicated the same trends (Ngah, Tai & Bontis, 2016; Al-Ahbabi *et al.*, 2017). The extent of knowledge management in the firms is low but wherever present it does lead to better organizational performance.

The results from this study combined with the overwhelming evidence for the link between knowledge management and better organizational outcomes like improved innovation, lower employee attrition, higher productivity, a stronger employer brand, ability to attract new customers and retain their loyalty, and higher financial performance have all pointed to the same conclusion that public sector organizations must build their capabilities to not only store and transfer knowledge but to create it through innovation and collaboration and to share it within and even beyond the organization through rapid and agile organizational and communication systems.

5.8.3. Actions and Business Excellence Implementation Outcomes

The final independent variable tested for its direct influence on business excellence implementation outcomes were actions. The results of the structural model analysis show that Hypothesis 3 is accepted ($\beta = 0.791$, $t = 15.475$, $p = 0.000$). This result, therefore, shows that the relationship between action and business excellence outcomes was positive with actions leading to better outcomes.

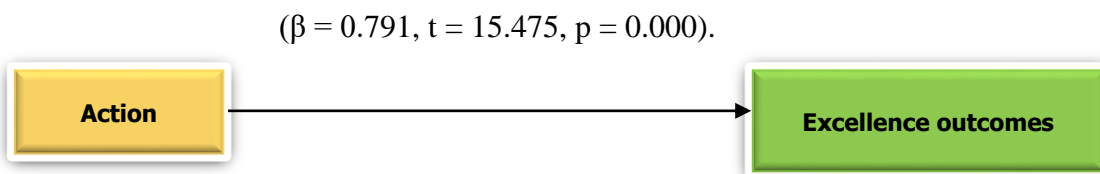


Figure 5. 4: Direct Effect of Action on business excellence outcomes

Managerial and employee actions are directly related to excellence outcomes as per literature as well. Managers motivate employees by setting targets, clarifying expectations, providing incentives, and acting as go-betweens for communication (Stoyanova & Iliev, 2017; EFQM, 2020). Employees, on the other hand, are instrumental in realizing targets and achieving objectives which makes them critical for business excellence outcomes (Jabnoun, 2019). A motivated

workforce can produce higher business efficiency mainly by increasing productivity and workers' willingness to work, enhance, and increase the income of an organization. Researchers have studied various manifestation of leadership and employee actions to show how they are related to business excellence implementation outcomes. For instance, grooming employees to become leaders of the future makes them better engaged, more committed, and hence, leads to better business excellence implementation outcomes for the firm including higher productivity, more creativity, and focused activity (Stoyanova & Iliev, 2017).

Motivated workers are, thus, able to achieve higher levels of internal and external performance by displaying commitment, engagement, and dedication. Such engagement ensures that the workers are interested in setting targets, provided incentives to develop and advance in areas that need improvement, offered non-individual compensation initiatives, and thus, deliver a better quality of performance (Ahrens, 2013).

Though this study has not explored the kind of actions which can be beneficial for the business excellence implementation, literature has shown that it is the top management's support, observable results, goal-oriented performance, communication and feedback, knowledge sharing, transparent working, positive attitudes, and rewarding behaviour which can be related to positive outcomes from business excellence (Santos *et al.*, 2018). The nature of these actions show that they have to build a positive attitude and promote knowledge sharing among employees in order for a positive impact. This is further evidence for the results of this study which have indicated that excellence as a variable which combines attitude, knowledge, and actions is more positively related to business excellence implementation outcomes than the individual variables.

Actions in research are a challenging construct as researchers interpret, report, and describe the actions differently. For a study using an extended literature review, the actions were interpreted in

terms of creating a strategic plan that allows the firm to exploit opportunities in its environment, build its capabilities, survive, and gain a competitive advantage (Afthonidis & Tsiotras, 2014). For a study based on Jordanian IT companies, the actions were expressed in terms of investments in IT and building sustainable strategies (Al-Qudah, Obeidat & Shrouf, 2020). Therefore, actions appear to be a much more sensitive concept as compared to attitude and knowledge when it comes to the evaluation of its relationship with business excellence. This sensitivity indicates that the nature of relationship will need the support of critical success factors in order for the benefits to be realized by the organization. With attitude too showing the need for such alignment, it is believed that organizations will need to decide these critical success factors before embarking on their journey of business excellence implementation. These critical success factors can be identified during the initial discussion with the various stakeholders which will allow their feedback to be built in the planned interventions making them more engaged with the process and more motivated to participate in the next cycle. In fact, the actions and critical success factors identified by each organization may even undergo changes during the implementation as the attitude, knowledge, and experience of the employees also improves. As mentioned earlier, the evidence of results from business excellence implementation will help in making these decisions and choosing when to adapt, improve, or even eliminate certain actions.

This point is demonstrated through an example from the field. Within a public sector organization included in this study and not named to protect its confidentiality, respondents from different departments were found to share differing views in the questionnaire. The researcher was able to observe certain causes which may have contributed to these differences. It should be noted here that these views are the subjective opinion of the researcher which should not be interpreted in the same vein as the quantitative results of this study which are aimed at generalizability to the

population. Continuing with the example, the first respondent worked in the marketing department where employees were actively working with external consultants to create a marketing campaign for a product.

The work environment appeared to be focused on identifying best practice sin marketing by other companies working in the field and using insights to create a campaign to appeal to the customer segment. This respondent rated those items higher which talked about employee participation and voice with leaders engaging the stakeholders. The second respondent belonged to the finance department where the work environment appeared to be focused on standardization, following those norms and practices which had been established earlier, and having a number of checks to ensure no mistakes. This respondent rated the items about top management's support and tacit knowledge higher than the previous person. Though these indications are subjective and based on observations, the researcher is of the opinion that managers should incorporate critical success factors necessary for their functions and for the needs of their teams and departments before applying these findings.

While acknowledging the differences in the nature of actions identified in literature and indicated through field observations and the work experience of the researcher, it is pertinent to mention the kind of actions that have been identified in studies conducted in public sector organizations in a similar context. In a study on one of the biggest Public Sector Units of India, Bharat Heavy Electricals Ltd. (BHEL) which won the EFQM award for business excellence and is the only Indian Public Sector organization to do so. In the journey detailed in the study, a number of actions taken over a period of time are mentioned which not only identify them, the sequence also shows how a sequential progression of these steps is critical for the success of business excellence. The first step taken by the organization was the enlisting of the top management's support for TQM in 2001.

This step helped the organization initiate the process of business excellence formally, get the entire organization aligned through the top management's seriousness, and made quality a part of the organizational culture. Within a year, the organization initiated a number of changes in technology like implementing an e-map, identifying its critical success factors, conducting an organizational health and safety audit, and aligning communication and information technology systems to quality. All these measures helped create synergy between the departments which is not only a requirement of business excellence (Snyder, Eriksson & Raharjo, 2020), it is also a challenge for public sector organizations in general (Cunningham & Kempling, 2009). The same strategy of implanting different interventions and platforms included in the year after with ERP (Enterprise Resource Planning) modalities set up to further facilitate coordination, communication, and responsiveness. For instance, the Business-to-Business portal called B2B helped BHEL coordinate with external stakeholders and other Public sector organizations.

In 2004, the organization further implemented measures like IMPRESS which stands for the Improving management competences on excellence-based stress avoidance and working towards sustainable organizational development in Europe. By the next year, the organization had grown in sophistication of its business excellence techniques with benchmarking, knowledge management, audit systems, and online catalogues of spare parts made available to not only engage with stakeholders, but invite their feedback actively and passively to improve their systems, policies, and practices. By 2006, which was the last year of this paper's report on BHEL, the organization had progressed to process mapping and X matrix.

This progression is an achievement for a public sector organization and shows the success of business excellence when implemented through strategized actions. In fact, this example is important to show that merely implementing a few critical success factors from rivals cannot be

enough as it needs to have the backing of the top management, the support of the strategy, the engagement of the stakeholders, and a long-term perspective. As a result, like in the case of attitude and knowledge, actions too should not be visualized individually for their impact on business excellence. Rather a strategy that allows the organization to capitalize on the three variables and their combined representation in excellence should be attempted.

A summary of the results for the hypotheses for direct relationship between independent and dependent variables is provided in the table below:

Research questions	Research hypotheses	Hypotheses Accepted ~ Rejected
Q1 How does attitude influence the business excellence outcomes in the public sector?	H1: There is a significant relationship between attitude and Excellence Outcomes	Accepted
Q3 How does knowledge influence the business excellence outcomes in the public sector?	H2: There is a significant relationship between knowledge and Excellence Outcomes.	Accepted
Q5 How does action influence the business excellence outcomes in the public sector?	H3: There is a significant relationship between action and Excellence Outcomes	Accepted
Q7 How does excellence (attitude, knowledge, and action) influence the business excellence outcomes in the public sector?	H4: There is a significant relationship between Excellence and Excellence Outcomes	Accepted

Table 5. 1 Hypotheses Association Testing Results

The results of this study confirm the hypotheses which were developed after a thorough literature review. With attitude, knowledge, actions and business excellence outcomes all found positively and directly related to business excellence implementation outcomes, the researcher has better motivation to use them as components in developing an excellence implementation framework for the public sector.

The next section discusses the findings of the second SEM model which presented design thinking as a moderator between excellence, attitude, knowledge, and action with business excellence implementation.

5.9. Design Thinking and Business Excellence Implementation

To assess the effect of a moderating variable on the relationship between the independent variable and dependent variable, the nature of relationship should change when the values of the moderating variable change. This moderation effect can be studied by including an interaction effect in the SEM model and checking to see if such an interaction is significant or not. In such an analysis, all predictors need to be standardized to make the interpretations easier and to avoid any problems of multicollinearity (Aiken, West & Reno, 1991). This standardization was done by subtracting a measured variable from its respective Mean and then dividing the result by its standard deviation. Having done this, the product of the indicator was then calculated and used as an indicator of the latent interaction term. To determine whether the moderator effect is significant, the effect of the interaction term on the dependent variable should be significant.

As in the case of direct relationships between the independent variables and the dependent variable, the moderation effect of design thinking determinants was also first verified through convergent and discriminant validity assessments. Twenty items were used to measure four first-order constructs in Design Thinking (DT): Empathize (EM), Define Implementation Problem (DI), Ideate for Implementation (II) and Prototype of Solutions (PR). Though one item for the independent variables was not found to fulfil the minimum criteria of the factor loadings, for the moderation effect of design thinking, all 23 items were observed to have factor loadings between 0.871 to 0.973. As a result, they fulfilled the requirements of being above 0.50 and were included in the final assessment. It is necessary to mention here that the highest values were fetched by the

Item PR5 at a factor loading value of 0.973 which states, “In my organization risk taking is promoted, even if it leads to mistakes and failure”. This item shows that the leaders are secure about existing knowledge, communication, and coordination between them and employees. They are also committed to innovation are ready to embrace failures (Lasrado & Uzbeck, 2017; Ghobakhloo & Azar, 2018; Jarde, 2019). Therefore, this item’s precedence in the opinions of the respondents is amply supported by literature. Moreover, as seen in the previous section, knowledge management and sharing are found to be positively and significantly related to business excellence implementation outcomes which is necessary if employees and leaders have to share their perception of excellence. Therefore, this study’s findings to support the result. The link between design thinking determinants and business excellence implementation has not been explored directly in literature with prototype being a specific component of the former. However, a case study of a prototype passenger car being instrumental in achieving business excellence has been described as a best practice (Toma & Naruo, 2017). In this case study, Toyota Motor Corporation placed quality improvement at the centre of their operations with constant improvements in design, operations, and development procedures to achieve their aim of a business excellence system. Another recent study which has explored the implementation of lean production methods in the Indian manufacturing industry and found it to meet the business excellence implementation outcomes of reduced wastage, improved productivity, and reduced cycle times also recommended the development of prototypes (Dutta & Mandal, 2020). Therefore, this study’s findings may provide further evidence for managers to be encouraged to apply design thinking determinants as valuable guiding posts for achieving business excellence implementation outcomes.

For defining implementation problem, the highest factor loading was observed for DI1 at 0.916 which proclaims, “In my organization, the initial problems related to excellence implementation

are reformulated in order to achieve a good result”. This item shows that the respondents believe in constant efforts for finding new ways of adding value, bringing innovation, and thus, achieving excellence. Innovation and value addition are critical business excellence drivers (EFQM, 2020). They are also supported by existing research as studies show that without innovation, a focus on quality, and constant efforts to improve it, business excellence cannot be achieved (Douglas & Vora, 2013; Androniceanu, 2017; Jarde, 2019). This item is also indicative of the efforts extended by the top management and the organizational leaders to encourage innovation and create opportunities where it can be applied. Innovation in name and without a chance for immediate implementation at work can discourage employees to seek out of the way alternatives and ideas. Innovation and creativity involve doing things in a different manner which makes people veer away from the usual way of doing things. Earlier models of quality believed in standardization and six-sigma with minimal mistakes and deviations from the prescribed design and course. Business excellence, on the other hand, has given innovation the due position in quality management which is critical for the survival of modern organizations which operate in very different markets. Standardization can offer economies of scale, but customers demand hyper-personalization in this age which needs new definitions of operations that can curtail costs without standardization and mass production. It is in these times, that public sector organizations need to redefine their critical success factors, gain the support of their human capital, and then choose those specific actions that can motivate their employees and contribute to their knowledge.

In Ideation, the highest value of factor loading was observed at 0.928 for II3 which states, “the organization is adopting innovative solutions to enhance its excellence outcomes”. This item’s connection to the earlier two statements described in the preceding paragraphs is evident as it too focusses on the innovation, which is supported by literature, as well as, lent higher credibility by

its repeated mention by the respondents. Therefore, innovation is definitely one of the more cherished and critical aspects of management which the respondents feel is needed for better business excellence implementation outcomes.

For the empathise determinant of design thinking included in this study, prototype, the highest factor loading was observed at 0.941 for EM3 which states, “In my organization, during planning phase for excellence, ample time is dedicated to assess employee needs.” This item’s strong agreement among the employees shows that they do believe in placing employees at the core of the planning process.

Amongst the four determinants of design thinking included in this study, it was Ideation which was found to be rated the highest with a Mean value of 6.35 and a standard deviation of 0.98 followed by Defining for implementation with a Mean value of 6.30 and a standard deviation of 1.11, Empathize with a Mean value of 6.25 and standard deviation of 1.17, and Prototype with a Mean value of 6.24, standard deviation 1.22. These findings indicate that public sector organizations’ senior managers believe that developing ideas for business excellence within their organizations requires their utmost attention and should lead to better implementation outcomes than the rest of the steps. Similarly, other results in the study have indicated that leaders’ actions, work for building positive and willing attitudes among the employees, and working to develop their knowledge are all positively related to business excellence implementation outcomes. Therefore, it is an accepted result that ideation is rated high than the other phases of design thinking. Defining, Empathize, and Prototype development have received similar Mean values among the public sector managers. Moreover, the Mean values are higher than average as the maximum score possible for each item was 7. Therefore, public sector managers in this study have provided a seal of approval for design thinking determinants in their role for business excellence

implementation when we consider the Mean values. The results of the SEM analysis will show if this approval is significantly related to the outcomes and the independent variables of attitude, knowledge, and actions.

Coming back to the positive response to the design thinking determinants, prior research has shown that it is positively related to organizational transformation, creativity and innovation. Customer focus, improved managerial decision making, organizational learning, and competitive advantage (Beckman & Barry, 2007; Arroyo *et al.*, 2018; Davis & Dolson, 2018). At the same time, there have been critics who point out that design thinking is, in effect, acting against the intentions by oversimplification. Moreover, when businesses pay inordinate amount of attention to asking the customers what they want rather than offer them solutions and services which they had not imagined, creativity suffers. This skewed focus is possible when managers disregard attention to disruptive technology and design in favour of user-centred design. Kupp *et al.* (2017) have thrown more light on the possible ill-effects of design thinking when structural limitations are not addressed. According to these researchers who have extensive experience in design thinking projects having provided their consultancy services for over fifty such projects, there is an inherent struggle between innovation and existing systems, culture, and practices within an organization. A disconnect between design thinking and business processes, the inability for leaders to devote significant time to projects, and the resultant lack of passion for design thinking cause difficulties in achieving the goals of design thinking.

The researchers have further identified four cultural factors that further affect the realization of these outcomes. The first is specialization where cross-functional collaboration and even communication are found to suffer as departmental leaders and employees continue to feel loyalties for their respective functions. Moreover, certain functions are actively dissuaded from

thinking creativity or from making any changes to existing processes which have been ratified through years of practice. The second factor is of certain leaders who are described as speed bumps who do not let others work creatively. The third cultural factor which is described as an inhibitor is a focus on financial results alone. This is an understood inhibitor as innovation and creativity involve several near-misses, mistakes, and hiccups before reaching a fully functional prototype. Therefore, managers have to learn to focus their attention on the amount of learning that happens in the organization due to the process of innovation than only focus on the cost-benefit analysis. Finally, the failure phobia is a connected factor which impacts the implementation of design thinking and the realization of the results from the process. When managers are afraid of any deviations from the norm, standardization and specialization fit the requirements and not creativity. At the same time, the latter are no longer suitable for most organizational and market contexts. These limitations are also the challenges seen in the bureaucratic functioning of several public sector units. Dubai's public sector organizations are described as being bureaucratic by some recent researchers (Biygautane & Al-Yahya, 2011; Mansour, 2017). Therefore, the researcher is of the opinion that all the respondents in this study who feel that design thinking is a positive impact on the realization of their business excellence implementation outcomes should identify the cultural factors which may impact the realization of these outcomes. Using the indicator cultural factors, managers can map the challenges in the existing organizational system which affect the path to innovation, customer focus, and human-centred decision making. Using these criteria as the beginning, organizations can work towards becoming more agile, responsive, and places which can incorporate design thinking.

The next step in the analysis of the SEM model's reliability and validity was to check the values of AVEs which were all found to be above 0.8 which is above the cut off value of 0.5 suggested

by Kline (2005a). Furthermore, the inter-correlations between the five constructs in the research model ranged from 0.647 to 0.847 which below the threshold 0.85 as recommended by Kline (2005a). The values of the correlation were lower than the square root of the average variance extracted by the indicators, demonstrating good discriminant validity between these factors. The composite reliability values were 0.948, 0.973, and 0.948 for Excellence (EX), Design Thinking (DT) and Business Excellence Implementation Outcomes (BE) respectively. These values exceeded the recommended value of 0.6 for all constructs as recommended by Peterson and Kim (2013). The Cronbach's Alpha values were 0.946, 0.973, and 0.950 for Excellence (EX), Design Thinking (DT) and Business Excellence Implementation Outcomes (BE,) respectively. These values were all above the threshold of 0.7 as suggested by Nunnally and Bernstein (1994).

Consequently, all measures to establish the validity and reliability of the SEM model were fulfilled by the data for this study. The next step was to test the structural model for the links between the variables by showing the specific details of the relationship between the independent or exogenous variables and dependent or endogenous variables (Marsh *et al.*, 2020). This is the second structural model which places design thinking determinants as moderators between the independent variables of attitude, knowledge, actions, and excellence and business excellence implementation outcomes. The model is depicted in Figure 4.14. The values of R^2 for the Business Excellence Implementation Outcomes (BE) was observed to be 0.725 which is above the threshold of 0.3 as recommended by Zhang (2009). The values of Q^2 for the Business Excellence Implementation Outcomes (BE) was 0.499 which is greater than zero showing the predictive relevance of the model as suggested by Chin (2010). As a result, the model was found to exhibit an acceptable fit and high predictive relevance.

5.9.1. Design Thinking, Excellence and Business Excellence Implementation

$$(\beta = .278, t = 3.314, p = 0.001)$$

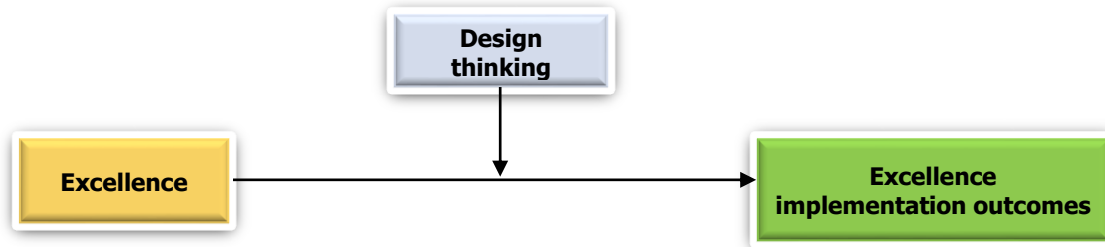


Figure 5. 5: Design thinking moderation on the relationship between excellence and excellence implementation outcomes

Hypothesis 8 which stated that Design Thinking moderates the relationship between Excellence and Excellence Implementation Outcomes was found to be Supported. This result indicated that Design Thinking (DT) does moderate the relationship between Excellence (EX) and Business Excellence Implementation Outcomes (BE). This relationship has in line with the indirect support of the literature which was evident as design thinking shares several attributes with business excellence implementation requirements. A human-centred approach, innovation focus, focus on strategy and goals, philosophy of altruism, collaboration and brainstorming, use of technology, user involvement, prototype usage, testing, experimentation, and need for resources were found to be linked to both design thinking and business excellence albeit in unrelated studies. This indirect evidence was necessary as this study is exploratory in nature looking for a guiding framework to improve the business excellence implementation outcomes in the public sector.

As no studies link design thinking with excellence directly, the researcher has looked into his field observations to find answers for this result. The data for this study was collected during the full

force of the COVID-19 pandemic which had forced several firms to scale down on operations and remove their workforce (Bloomberg, 2020; Godinho, 2020). Though the public sector did not see as many job losses and salary cuts as the private sector, the overall work environment has been gloomy with the focus on achieving efficiency over excellence. Furthermore, the shift to remote working in many organizations, has removed the earlier levels of personal coordination, teamwork, and leadership dynamics. As a result, the findings in this time should be considered in the context of the changes brought about by the pandemic. As the moderation of design thinking is connected to business excellence even during the shift in work environment, the focus on innovation and people can be even more beneficial in achieving the desired output.

5.9.2. Design Thinking, Attitude and Business Excellence Implementation

Design thinking determinants were found to be positively and significantly related to business excellence implementation outcomes and the attitude of the employees. The 'p' value of 0.00 is lower than the prescribed value of 0.05 which makes this moderation effect significant. Moreover, the path coefficient value of .419 and 't' value of 4.462 was observed. As a result, Hypothesis 7 was found to be supported by the data.

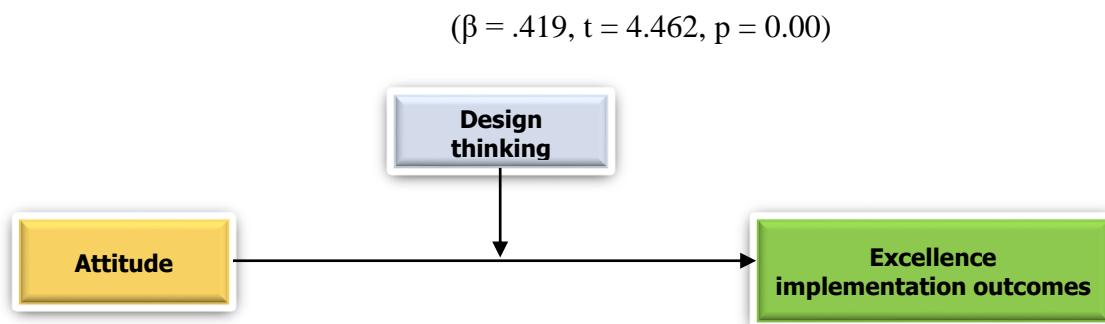


Figure 5. 6: Design thinking as a moderator of the relationship between Attitude and Excellence implementation outcomes

The existing literature has not linked design thinking with business excellence implementation outcomes. However, both these constructs share a number of characteristics in a human-centred approach, innovation focus, focus on strategy and goals, philosophy of altruism, collaboration and brainstorming, use of technology, user involvement, prototype usage, testing, experimentation, and need for resources which have been discussed at length in chapter 2. Amongst these factors, attitude is linked to the human-centred focus of the leaders who need to place the needs, motivation, and leadership support of the human capital at the forefront of business excellence implementation (Lepeley, 2020). The focus on innovation is also brought about through an attitudinal change where employees have to be made aware, educated, and supported in their quest for creativity and innovation (Beckman & Barry, 2007; Birdi, Leach & Magadley, 2016). Similarly, heeding the goals and strategy of the organization will require the employees to place the organization before departmental and even their own goals. Altruism, experimentation, testing, brainstorming, and collaboration all necessitate the need for positive attitude of the employees which will then work towards extracting the best outcomes from the business excellence framework (Bobrek, Majstorovic & Sokovic, 2006; Boy, 2017).

With design thinking and business excellence sharing several characteristics, the determinants of design thinking are also connected to attitudinal change and involvement. Empathy is an attitude in its own right and without it employees and leaders are both at a loss as the former do not empathize with requirements while the latter do not emphasize with the needs of the employees (McDonagh & Thomas, 2010). Definition of business excellence requirements requires a willing and positive attitude of the employees for effective brainstorming and collaboration (Beckman & Barry, 2007). Ideation too requires brainstorming and willing participation of the employees while

prototypes need employees to go the extra mile in finding new solutions for problem solving (Carlgren, Rauth & Elmquist, 2016a).

These studies, thus, support the findings of this study and establish that design thinking determinants are positive moderators for the achievement of business excellence implementation outcomes.

5.9.3. Design Thinking, Knowledge and Business Excellence Implementation

$$(\beta = 0.272, t = 2.459, p = 0.014)$$

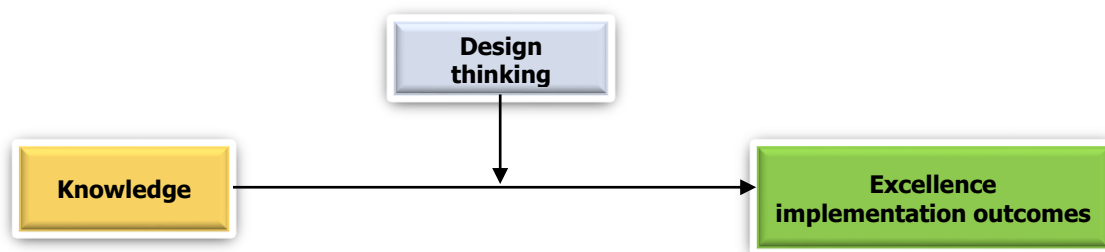


Figure 5. 7: Design thinking as a moderator of the relationship between Knowledge and Excellence implementation outcomes

Hypothesis 6 which states that design thinking moderates the relationship between knowledge and Excellence Implementation outcomes was found to be significant. With a ‘p’ value of 0.014, design thinking determinants were found to be moderating the relationship between knowledge and business excellence. Knowledge has already been significantly linked to business excellence which implies that the variable of design thinking which is linked to business excellence in this relationship can further enhance the implementation outcomes. As in the case of excellence, knowledge too has a lot of intuitive and indirect evidence for linking it to design thinking. Beginning from a human-centred approach to innovation focus, focus on strategy and goals, philosophy of altruism, collaboration and brainstorming, use of technology, user involvement, prototype usage, testing, experimentation, and need for resources, all factors involve the

knowledge management of the employees and are common to design thinking and business excellence. Therefore, this result is as expected as per the existing indicators of literature review. Furthermore, the field observations while collecting data have showed that the impact of the COVID-19 pandemic has shifted priorities for managers and employees. Despite this shift in priorities and changes in the work environment, design thinking is found to moderate knowledge and business excellence showing the benefits of using a design thinking framework. Any other causes leading to this result need further research preferably at the grounded theory level using a qualitative research design.

5.9.4. Design Thinking, Actions and Business Excellence Implementation

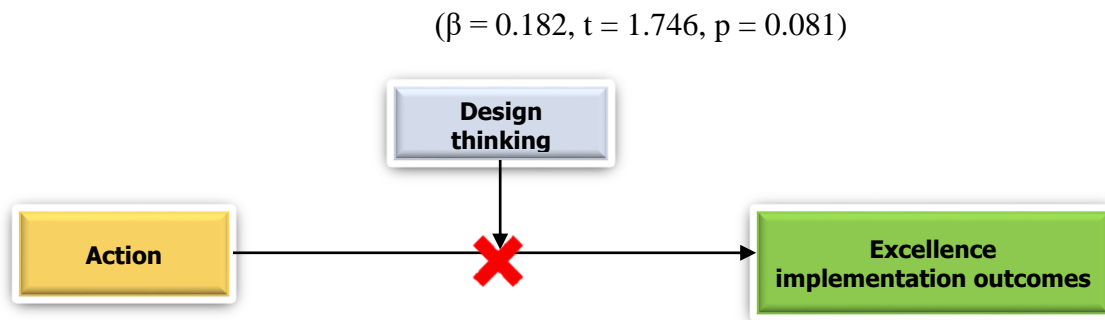


Figure 5. 8: Design thinking as a moderator on the relationship between Action and Excellence implementation outcomes

Hypothesis 7 which explored the moderating effect of design thinking on business excellence implementation outcomes was found to be rejected. The results showed that despite actions being in a significant relationship with business excellence directly, the influence of design thinking was absent. This result implies that design thinking determinants were, in fact, not affecting the achievement of business excellence implementation outcomes. This relationship does not have the evidentiary support of literature as Design Thinking determinants and business excellence have

similarities in the common factors of a human-centred approach, to innovation focus, focus on strategy and goals, philosophy of altruism, collaboration and brainstorming, use of technology, user involvement, prototype usage, testing, experimentation, and need for resources. Therefore, not finding a significant relationship is without any scholarly support.

The only reason which can attribute to the lack of positive relationship between these variables is the prevalence of a negative environment at work during the pandemic where actions focused on excellence were found to be not influenced by empathy, definition, ideation, and prototypes. This result indicates that the leaders and managers have not only been concentrating on routine tasks, but also any tasks considered to be focusing on other criteria are believed to be affecting excellence. This insight has support from a recent study where the reconfiguration of working during COVID-19 pandemic is described as an example of office working protocol reengineering (Parker, 2020). In this reengineering, the researcher has stated that managers face a choice of prioritization between concerns like occupational health and safety and financial returns. This study, therefore, shows that determinants like empathy, definition of excellence, ideation, and prototype development may have been demoted in priority as firms focused on financial returns for survival.

As a result, the moderation effect of design thinking was seen to be positive for excellence, attitude and knowledge while being missing for actions. These results have been critically analysed keeping in view the existing body of knowledge and the researcher's field observation while collecting data. The following table summarizes the status of the hypotheses related to design thinking.

Research questions	Research hypotheses	Hypotheses Accepted~Rejected
Q2: How does the design thinking, and its determinants affect the relationship between attitude and business excellence outcomes in the public sector?	H5: The impact of attitude on excellence implementation outcomes is significantly influenced by design thinking and its determinants	Accepted Positive influence
Q4: How does design thinking and its determinants affect the relationship between knowledge and business excellence outcomes in the public sector?	H6: The impact of knowledge on excellence implementation outcomes is influenced by design thinking and its determinants.	Accepted Positive influence
Q6: How does design thinking and its determinants affect the relationship between action and business excellence outcomes in the public sector?	H7: The impact of action on excellence implementation outcomes is significantly influenced by design thinking and its determinants.	Rejected No influence
Q8: How does design thinking and its determinants affect the relationship between excellence (attitude, knowledge, and action) and business excellence outcomes in the public sector?	H8: Excellence (attitude, knowledge, and action) is influenced by design thinking and its determinants in its relationship with excellence implementation outcomes.	Accepted Positive influence

Table 5. 2 Hypotheses related to the moderation effect of design thinking

5.10. Summary

The results presented in this chapter have shown the main findings of the data analysis with an overview of the defined research objectives while comparing them with the existing scholarly literature and the related theoretical framework. The research questions formed the guidance for the discussion in the way the results are presented with the hypotheses testing and validation describing the assessed relationships. There are six main parts for this chapter which discuss the data analysis. The first part provides an overview of the business excellence implementation in the public sector while the second provides the analysis of the demographic profile of the respondents.

The third section provides the findings from the questionnaire items using the central measures of tendency while it is the fourth section begins with the SEM analysis. The prerequisites of the SEM model are presented first followed by the establishment of the validity and reliability of the model in terms of its convergent and discriminant validities and internal consistency. After the goodness of fit of the models is established the direct effect of the independent variables of attitude, knowledge, actions, and excellence on business excellence implementation outcomes is presented first. The second model is then described for the moderation effect of design thinking and its determinants.

There is a significant positive relationship between attitude and excellence implementation outcomes. This relationship indicates that as attitude increases, excellence implementation outcomes tend to increase. This result means that increasing the positive attitude of the employees from the public sector organizations and their willingness to perform the requirements towards excellence implementation will lead to an increase in the outcomes of the excellence implementation. This result is in line with the existing literature which measures the relationship between the attitude and the project management maturity level. The impact of attitude on excellence implementation outcomes is affected by design thinking as well with the relationship being moderated by design thinking determinants.

There is a strong positive relationship between knowledge and excellence implementation outcomes. This relationship indicates that as knowledge increases, the excellence implementation outcomes tend to increase. This result means that increasing the knowledge of the requirements of business excellence implementation, as well as the understanding of the whole picture with the ability to perform different requirements, will increase the outcomes of excellence implementation. This result too is in line with existing scholarly literature and practice. The impact of knowledge

on excellence implementation outcomes is affected by design thinking and its determinants (empathize, define, ideate, and prototype). This result shows that the knowledge management and sharing in organizations is found to increase with design thinking determinants and lead to better achievement of business excellence implementation outcomes.

There is a strong positive relationship between action and excellence implementation outcomes. This relationship indicates that as actions increase, excellence implementation outcomes tend to increase as well. This relationship means that increasing the actions taken to fulfil the requirements at different levels while actually performing the requirements, will lead to an increase in the outcomes of excellence implementation in the public sector organizations. This result is supported by existing literature and managerial practice. The impact of action on excellence implementation outcomes is not affected by design thinking, showing that the moderation effect is absent with design thinking determinants leading to no impact on business excellence implementation. This result is believed to be seen due to the impact of COVID-19 pandemic which has shifted managerial priorities from a pursuit of excellence to financial results, efficiency, and survival.

There is a strong positive relationship between excellence (attitude, knowledge, and action) and excellence implementation outcomes. This relationship indicates that as excellence increases, excellence implementation outcomes tend to increase. This result means that increasing the level of excellence (attitude, knowledge, and action) in the public sector organizations will lead to an increase in the outcomes of excellence implementation. This result is in line with existing literature, practice, and intuitive beliefs. The impact of excellence (attitude, knowledge and action) on excellence implementation outcomes is affected by design thinking as the P-value is less than 0.001 in testing if the relationship is moderated by design thinking. The impact of the influence of knowledge and attitude when moderated by design thinking on business excellence

implementation outcomes are the direct cause of this significant relationship between excellence and business excellence implementation outcomes when moderated by design thinking determinants.

To conclude, the chapter has discussed the results of the positive impact of public sector organizations' employee attitude, knowledge, and actions on the business excellence outcomes.

The conclusion and the achievement of the research objectives will be illustrated in the next chapter.

6. Chapter Six: Conclusion and Recommendations

The previous chapter presented the findings of this study in light of the existing scholarly literature and field observations of the researcher. The chapter began by discussing the responses to the various items that formed the scales for measuring the independent variables of employee attitude, knowledge, actions, and excellence, the moderating variable of design thinking and its determinants of empathy, definition, ideation, and prototype development, and the business excellence implementation outcomes. The second part of the chapter presented the demographic profile of the respondents presenting the gender, experience, educational level, and job positions of the 141 respondents who participated in the questionnaire survey. The third part of the chapter presented the reliability and validity of the questionnaire scale followed by the goodness of fit of the SEM models created to measure the direct and moderated impact of the independent variables on the business excellence implementation outcomes. The results of the SEM models were presented next with discussion of the findings of each relationship explored in the study.

This chapter concludes this study by assessing the success in the achievement of the research objectives and the key findings. This chapter will also include the provided framework as per the seventh objective identified for this research which is a design thinking-based framework aimed to support the realization of more effective business excellence implementation outcomes. The study's strengths and suggested areas for improvements are also presented to make future consumers of this research better informed and prepared before replicating the findings for their use. Furthermore, the academic and empirical contributions of this research are elaborated. Finally, the general recommendations, recommendations for future research, and research limitations are discussed for future research benefits.

6.1. The achievement of the research objectives

This research had its genesis in the importance of the human capital to an organization in meeting its objectives. Business excellence is the evolved version of TQM which has made it possible for leaders to not only meet organizational goals well but prepare the organization for future needs, deliver a competitive advantage, and ensure the survival and success of the firm. As the most important resources for organizations' excellence and success are its people, they are the tools and the targets of all excellence efforts. Consequently, this research's focus was on the attitude of the employees towards the excellence requirements, their knowledge of the requirements, and their actual actions to perform those requirements, which lead to a raise in the competitiveness of the public sector organizations enabling them to reach outstanding results and overcome their challenges and threats. As the private sector has several studies exploring the context of business excellence while having different conditions of existence than the public sector about which not much is known, this study has made the latter its focus.

The main objectives of this research have been to identify if the attitude, knowledge, and actions of the public sector employees are impacting their organization's excellence outcomes, and if this impact is influenced by design thinking and design thinking determinants. The seventh and final objective is to provide a design thinking-based framework for effective business excellence outcomes in the public sector. The achievement of the research objectives illustrated below provide a clear understanding to the proposed solutions of this research.

6.2. First research objective

The first research objective aimed to "identify whether a relationship exists between the attitude of the employees in the public sector towards business excellence implementation and the excellence implementation outcomes". The related hypothesis to answer this objective is:

- There is a significant relationship between attitude and business excellence implementation outcomes.

The results of the Pearson's correlation showed that attitude is strongly and significantly related to business excellence implementation with a high effect size. Furthermore, the analysis of the reliable and valid SEM model for testing this hypothesis revealed that Hypothesis 1 is accepted as the relationship between the employees' attitude towards business excellence implementation outcomes is positively related to it. In other words, employees being willing to perform excellence requirements improves the excellence implementation outcomes. This means that working on raising the level of positive attitude among the public sector organizations' employees will lead to better outcomes for the business excellence implementation. This result is in line with the existing research and also has intuitive value. As the employees are the tools as well as the target of the business excellence in any organization, the management of these organizations need to take the employees' attitude in consideration to achieve the desired objectives related excellence implementation outcomes. Based on this finding, the organizations need to identify the best ways for positively influencing the attitude of their employees and motivating them towards the implementation of the business excellence requirements. It is also equally important that the organizations minimize any negative effects on the employees' attitude and address any policy or managerial practice that leads to a decrease in the employees' willing to perform excellence requirements well. Such an approach will improve the employee attitude towards business excellence and improve the outcomes for the organization.

6.3. Second Research Objective

The second research objective was to, "identify if the relationship between the attitude of the employees in the public sector and the excellence implementation outcomes is moderated by

design thinking and its determinants”. Hypothesis 2 was formulated to help answer this objective which proclaimed that design thinking and its determinants moderate the relationship between attitude and business excellence implementation outcomes. The results of the Pearson’s correlation showed that attitude is strongly and significantly related to design thinking, as well as business excellence implementation with a high effect size. Furthermore, the results of the SEM model analysis showed the model to have goodness of fit with acceptable limits of convergent and discriminant validities. The results of the structural model analysis revealed that attitude does lead to a positive influence on business excellence implementation outcomes when moderated by design thinking.

It is notable that attitude was found to be positively moderated by design thinking determinants while actions were found to be unaffected. Knowledge and Excellence, on the other hand, were also positively related to business excellence implementation outcomes. As a result, it is evident that design thinking determinants can positively influence employee attitude to make them more willing to fulfil the business excellence implementation outcomes. It is possible that the impact of design thinking on attitude takes more time and reflection for the employees. Therefore, the managers should aim to build more awareness about the need for business excellence, how it can improve the jobs and work environment of the employees, and how its targets can be linked to the individual achievements and motives of the employees. Such awareness and communication will further improve the probability of the success and quality of business excellence implementation outcomes.

The results of these two objectives are in line with existing research, as well as the commonalities between design thinking and business excellence implementation outcomes. Between the common characteristics of a human-centred approach, innovation focus, focus on strategy and goals,

philosophy of altruism, collaboration and brainstorming, use of technology, user involvement, prototype usage, testing, experimentation, and need for resources, employee attitude can be associated with the human-centred approach, focus on innovation and strategy, belief in altruism, and willingness to collaborate, brainstorm, use technology, involve users, use prototypes, and test and experiment.

Furthermore, the determinants of design thinking can be useful for achieving the requirements of public sector organizations' ability to meet their business excellence outcomes. Empathizing with the most important needs of the employees will make the leaders approach the issues from their point of view, in order to explore the real needs, obstacles, and problems faced by the public sector organizations' employees which may prevent them from developing a positive attitude towards implementing the business excellence requirements. Moreover, such an approach will also help avoid any prior assumptions preventing the leaders from reaching the root causes of problems and obstacles without any barriers. In other words, the excellence planners (designers) should put themselves in the place of the employees to plan and design business excellence to clearly understand the aspects affecting the employees' attitude and their willingness to perform business excellence requirements.

At the same time, the relationship between attitude and business excellence implementation outcomes is moderated by defining the problems. Therefore, clearly defining all aspects of the needs, problems, and obstacles that affect the employees' attitude towards business excellence implementation requirements and their views to raise the willingness to perform better among the public organization employees by integrating, merging, and analysing all the information gathered in the emphasize stage can be useful. Then as the excellence planners and designers have a clearer understanding of the aspects affecting employees' attitude toward business excellence

implementation requirements, they can better capture the ideas, alternatives, and initiatives for positively affecting the employees' attitude. This definition will be based on the findings of data analysis and the information gathered in the previous stages, because the relationship between attitude and business excellence implementation outcomes is moderated by ideation. The planner and designer need to refer to the employees, leaders and concerned personnel in the organization to test the proposed solutions to ensure that they are meeting their needs and expectations and will be able to achieve the desired objectives by affecting the employees' attitude positively.

Moreover, the relationship between attitude and business excellence implementation outcomes is moderated by prototype development. After defining and understanding the root causes of the attitude towards excellence implementations problems and agreeing on the right solutions, discussing ideas and initiatives with the users within the organization, action plans need to be developed for implementing the agreed solution. The action plans should include the actions needed for implementation with clear responsibilities, implementation time frame, and needed the financial and nonfinancial resources. The action plans need to be discussed with all concerned within the organization to ensure that it will meet the needs and expectations and positively affect the employees' willingness to perform excellence implementation requirements positively. Finally, the action plans need to be approved by the top management before implementing and the monitoring and evaluation stages.

It is important to reflect on this result in the perspective of what is known about the employee attitudes in the public sector in Dubai. Employees perform eight leadership roles in Dubai's public sector organizations beginning with "accountability, rule-following, political loyalty, network governance, task-oriented, relations-oriented, change-oriented and diversity-oriented leadership" (Mathias, Fargher & Beynon, 2019). In this study, 900 public sector employees were asked to

answer a questionnaire survey where the fulfilment of these eight roles was found to lead to greater employee happiness. Another important point brought out in this study was that the opinions of the public sector employees in Dubai were not very different from those of their counterparts in Western nations. Therefore, steps taken by leadership in bettering employee attitudes are found to make employees more satisfied. As a result, active steps should be taken to mould employee attitude towards the achievement of business excellence implementation outcomes.

6.4. Third Research Objective

The research objective aimed to “identify if there is a relationship between the knowledge of the employees in the public sector about business excellence implementation and the excellence implementation outcomes”. The related hypothesis is:

- There is a significant relationship between knowledge and business excellence implementation outcomes.

The results of the Pearson’s correlation showed that knowledge is strongly and significantly related to business excellence implementation with a high effect size. Furthermore, the direct influence of knowledge on business excellence implementation outcomes was found to be positive and significant. Therefore, the relationship between knowledge of the employees in the public sector organizations of Dubai and the business excellence implementation outcomes, in other words, their ability to perform excellence requirements were found to improve the excellence implementation outcomes. This result means that working on raising the level of knowledge among the public sector organizations’ employees will lead to better outcomes of the business excellence implementation. The existing literature, best practices in the industry, and the field observations of the researcher all point to the growing importance of knowledge management in organizations. The employees are the tools and also the targets of the business excellence in any organization

which is why the managers of the organizations need to provide their employees with the right knowledge to increase their ability to perform the excellence requirements to achieve the desired objectives related to the excellence implementation outcomes. Based on this finding, it is established that the organizations need to motivate the employees to acquire, classify, store, and share the excellence related knowledge in order to increase build the pool of knowledge in the employee pool to the maximum which, in turn, will lead to maximization of the excellence implementation outcomes. An important addition to the findings is that knowledge of participants was found to be negatively related to their gender. Though a qualitative study will aid in understanding the reason for this result, it is important to bridge the gap in knowledge of male and female managers.

In the context of Dubai's public sector, the challenges of reducing budgets, growing lack of talent which migrates to the private sector, attempts to nationalize the workforce, and choose the citizens of the UAE over the expatriates have affected the operations of the public organization (Biygautane & Al-Yahya, 2011). Moreover, the nature of employment and management in Dubai organizations has been such that consultants are hired for specialized knowledge which offers access to expert opinions and expertise but make continuity difficult. More importantly, the organization remains at the backfoot with reactive management practices that solve problems well but cannot anticipate them as the employees are unable to see the coming trends and prepare for them. These challenges all require effective knowledge management without which the employees cannot develop their knowledge base and capacity to proactively take decisions for the betterment of the organization. The researchers have further reported that knowledge management has dual benefits for organizations. First, it helps the employees to share experiences, learn from mistakes, and hence, improve their skills and performance. Secondly, it allows the organization to build more efficient

operations, better quality, higher productivity, and improved decision making. Another study located in a public sector organization of Dubai, Roads and Transports Authority, Dubai, reported that knowledge management is positively linked with organizational performance. Using the opinions of 255 employees of the organization, the researchers concluded that learning organizations effectively mediate the relationship between knowledge management capabilities and the organizational performance (Nghah, Tai & Bontis, 2016). Therefore, knowledge management has special significance for Dubai's public sector organizations.

Another study based on Dubai's municipal corporation pointed out that the organization is not able to convert knowledge management into organizational learning (Haak-Saheem & Darwish, 2014). This lacuna exists as the managers have relied heavily on the written form of knowledge sharing through manuals, official statements, and policy documents which fail to inspire learning and implementation.

6.5. Fourth Research Objective

The fourth research objective aimed to “identify if the relationship between the knowledge of the employees in the public sector about business excellence implementation requirements and the excellence implementation outcomes is moderated by design thinking and its determinants”. To answer this objective, Hypothesis 6 was formulated to measure the impact of knowledge on excellence implementation outcomes being moderated by design thinking and its determinants.

The results of the Pearson's correlation showed that knowledge is strongly and significantly related to business excellence implementation, as well as design thinking with a high effect size. Furthermore, the results of the structural model analysis checking for the moderation effect of design thinking was found to be significant. This result, therefore, showed that the relationship between knowledge of the public sector organizations' employees about business excellence

implementation requirements and the business excellence outcomes is moderated by design thinking and its determinants. This result is one of the critical expected outcomes as suggested by existing literature and also reflected by the presence of a significant and positive relation between knowledge and business excellence implementation outcomes. Furthermore, the presence of a positive moderation effect of design thinking for the employee attitude is another indicator which suggested that knowledge as well will find positive moderation.

Though existing literature and other findings of this study suggest that knowledge should be positively moderated by design thinking, the field observations of the researcher have helped understand this result. The data collection for this study happened over the course of COVID-19 pandemic which affected the public, as well as the private sector's work environment. Though the public sector in the UAE has not seen as many terminations and reduction in salaries as other organizations, the dynamics of working in teams, leading employees, and prioritization of excellence have all been affected. As a result, the moderation effect of design thinking determinants should be seen in the context of this unprecedented human and organizational crisis. The change in focus from knowledge sharing and building is very welcome as the COVID-19 pandemic has created challenges in communication, difficulty in reaching information stored in silos as more and more workers shift to remote working, an associated difficulty in accessing information, and an increase in the time taken to search for information (Simone, 2020). Therefore, it is this time when implementing design thinking can help organizations gather their mojo back and regain their confidence in working.

Furthermore, the necessity to invest in knowledge management has grown even more during the pandemic as organizations who have successfully harvested existing knowledge and applied it to solve the challenges of COVID-19 have shown the advantage it accords them. One such example

is the application of lessons learnt during the Nipah virus to manage COVID-19 by the public health department of Kerala, India (Rao, 2020). This public sector organization updated its protocols of work and applied community management principles learnt from the management of Nipah virus to make sure that no time was lost in controlling the early cases of COVID-19. Similar examples exist of Taiwan which capitalized on its knowledge from the management of the SARS virus to control COVID-19 cases with exceptional discipline in its populace about the use of masks, social distancing, border controls, and communication in the public sector organizations involved in managing the health crisis.

Some more innovative measures were created through knowledge management like apps to track and monitor the number of cases in a neighbourhood and working and collaborating with other public and private health institutions to make sufficient resources available to tackle emerging cases. This crisis has shown how the need for harvesting, managing, and sharing knowledge becomes all the more dire during a difficult time. While many organizations especially in the sectors most seriously disrupted by the pandemic, health, education, and event management, adopted new ways of delivering value to the customers, many others failed to learn and develop. In the end, the efficacy of knowledge management came to rest on the priorities set by managers during this crisis. As the study has reflected knowledge to be moderated by design thinking, and to be directly related to business excellence, it can be estimated that it is the determinants of design thinking which are empathy, definition, ideation, prototype development, and testing which are also found to be important by the respondents.

As the existing, as well as recent research shows that knowledge management has renewed significance in the current context, the researcher would note that the moderation effect of design

thinking on knowledge management should still be explored further to find more critical success factors that can support researchers and practitioners alike.

6.6. Fifth Research Objective

The fifth research objective says that “if there is a relationship between the actions taken to fulfil the requirements of business excellence implementation in the public sector and the excellence implementation outcomes.”

The related hypothesis is:

- There is a significant relationship between action and Excellence implementation outcomes.

As mentioned, and based on the results, the researcher accepted H3 which proves a positive relationship between the actions taken to fulfil the requirements of business excellence implementation in the public sector and the excellence implementation outcomes. In other words, their actions of performing the excellence requirements are directly related to the accomplishments of the excellence implementation outcomes. The results of the Pearson’s correlation showed that actions are strongly and significantly related to business excellence implementation with a high effect size. Furthermore, as per the results of the SEM model, the relationship is positive which means that working on raising the level of actions among the public sector organization’s employees will lead to better outcomes of the business excellence implementation. Based on this result, the organizations need to focus on encouraging the employees to translate the positive attitude and the right knowledge they have related to business excellence requirements into actual behaviour to perform the requirements and achieve the desired excellence implementation outcomes.

The encouragement is an important aspect of this relationship as motivation is consistently linked to business excellence (Colvin & Boswell, 2007; Dahlgaard-Park, 2011). In this endeavour, recent research has shown that efficiency wages and informative feedback can be instrumental in motivating employees towards business excellence outcomes (Fernández, Valle & Pérez-Bustamante, 2020). Moreover, the achievement of the business excellence outcomes is brought about through a guiding model whose requirements enable employees to get better clarity about the requirements and standards of performance. This creates a self-serving cycle of performance (Veselova, 2016). It is also described as a critical success factor for achieving business excellence and innovation (Santos *et al.*, 2018). Motivation is, thus, one of the critical actions that link to the achievement of business excellence outcomes. It is necessary to add here that actions are also found to be negatively moderated by gender which needs further exploration to identify its root causes and to find the best way to mitigate this gap.

A related action which finds a lot of mention in existing literature is performance management. Performance indicators operationalize the business excellence requirements and link them to individual standards of performance (Abubakar *et al.*, 2019). Consequently, the employees become more motivated and encouraged to work towards set targets. Performance targets also provide a framework for communication between the employees and the leaders which lead to quality improvement and hence, contribute to the outcomes. In fact, it is pointed out that performance appraisals, communication, and feedback are critical to the constant revisions required for maintaining a high standard of quality which is the first necessity of business excellence (Androniceanu, 2017). The performance management criteria ensure that workers are interested in setting targets, provided incentives to develop and advance in areas that need improvement, offered collective compensation initiatives, and obtain input from well-trained staff (Stoyanova & Iliev,

2017; EFQM, 2020). This is why performance management-related actions are consistently linked to the achievement of the business excellence framework (Ferdowsian, 2016; Lasrado & Gomiscek, 2017; Toma & Marinescu, 2018).

Leadership behaviours are another important variable that ensure the employees participate in the organizational practices and are committed to continuous improvement (Jabnoun, 2019). Leaders have the ultimate responsibility for meeting organizational goals which suggest that the actions they take in ensuring compliance from the employees are important for meeting the requirements of business excellence. Moreover, the need for constant changes, consistent growth towards higher quality, and the need to innovate all suggest that mere compliance is not of much use in this regard. Rather, leaders and employees have to aim for self-responsibility, commitment, and organizational citizenship behaviours. Some leadership behaviours found to be important for business excellence are the identification of critical business values which need to be consistently reminded and applied in the business context and the promotion of an entrepreneurial spirit among the employees (Savolainen, 2000).

These are important pointers as they show how leaders can continue to inspire their employees to work hard as per the criteria upheld by the business while also encouraging them to strive for innovation and enterprising attitude. Therefore, it is no surprise that some researchers consider leadership to be the central tenet for achieving business excellence (Douglas & Vora, 2013). Even if we consider that motivation and performance management are also important managerial actions, leadership is also one of the more critical actions needed for optimum business excellence outcomes.

As a result, actions are linked to business excellence implementation outcomes positively and should be considered as one of the critical areas requiring managerial and organizational attention.

6.7. Sixth Research Objective

The sixth research objective enquired “if the relationship between the actions taken to fulfil the requirements of business excellence implementation in the public sector and the excellence implementation outcomes is moderated by design thinking and its determinants”.

The related hypothesis is:

- The impact of actions on excellence implementation outcomes is affected by design thinking and its determinants.

The results of the Pearson’s correlation showed that actions are strongly and significantly related to both business excellence implementation and design thinking with a high effect size. Furthermore, the results of the SEM model 2 which assessed the moderating action of design thinking and its determinants of empathy, definition, ideation, prototype, and testing, between actions and business excellence implementation outcomes showed that the relationship is not significant. This result implies that the relationship between action taken by the public sector organizations’ employees for the implementation of business excellence requirements and the business excellence outcomes, is not moderated by design thinking and design thinking determinants. This means that the use of design thinking approach by the public sector organization will not affect the employees’ excellence related actions on the outcomes of the excellence and make the implementation more effective as the direct relationship between these variables are positive. This is an understandably unexpected outcome as design thinking has been found to positively moderate attitude, knowledge, and excellence with business excellence outcomes and it is expected from the available literature and this result that it should have positively moderated this relationship as well.

In the face of this result, the researcher was forced to reflect on his field observations to find reasons for this relationship. The main reason, as per the field observations of the researcher, that can contribute to this result is the work environment during the ongoing COVID-19 pandemic. The unprecedented conditions of work which have forced employees to work from home, disrupting their usual work practices while also creating a fear psychosis of losing jobs or getting salary cuts has contributed to a workspace which is unlike any other experienced before. This disruption has also been noted by Parker (2020) who calls it the reconfiguration of working during COVID-19 pandemic leading to office working protocol reengineering.

In such an environment, actions focused on excellence have been found to be not influenced by empathy, definition, ideation, and prototypes of design thinking. During these times, the choice before the managers is with respect to critical concerns like ensuring the survival of the business, increasing business revenue, and ensuring that new customers are available for the business. In such times, the focus has shifted from TQM and forced leaders to reorient their priorities. Moreover, leaders and managers cannot afford to divide their attention from critical business areas which has diverted their actions from TQM and business excellence. This study, therefore, shows that determinants like empathy, definition of excellence, ideation, and prototype development may have been demoted in priority as firms focused on financial returns for survival.

This relationship between the variables has not gone with the indications shown by the existing research. If we consider the determinants of design thinking, the moderation effect of each of them is suggested by existing studies on design thinking.

Empathizing the most important needs of the employees from their point of view is important in order to explore the real needs, obstacles, and problems faced by the public sector organizations' employees while performing the business excellence requirements (Msallam, Al Shobaki & Abu-

Naser, 2020). The excellence planners and designers should put themselves in the place of employees to plan, design and clearly understand the aspects affecting the employees' actions and their actual performance of different requirements related to business excellence. In the absence of a significant relationship, it is shown that this empathy will not turn employees towards the business excellence requirements. Now this result may show two things; first that the leaders are not interested to grasp the real situation of the employees during the pandemic or second, that the empathy is not translated into the business excellence requirements making the employees and leaders feel frustrated. However, at this juncture, it is not possible to answer this question definitively and further research is required to understand if this result is due to the pandemic or reflective of a broader issue.

The relationship between action and business excellence implementation outcomes is not moderated by defining. Defining details all aspects of the needs, problems, and obstacles that affect the employees' actions in the business excellence implementation requirements and their views to raise the actual performance of excellence requirements among the public organizations' employees through integration, merging, and analysis of the information gathered in the empathy stage. Then as the excellence planners and designers have a clear understanding of the aspects affecting employees' actual actions needed for the business excellence implementation requirements, they need to capture and create the ideas, alternatives and initiatives for affecting the employees' actions positively. As the moderation effect of defining has also been reported to be absent by the respondents of this study, it appears that defining tasks is not positively affecting the employees in the pursuit of business excellence implementation outcomes. This is an unexpected result which the field observations can also not describe completely. As a result, the

unknown factors which are causing public sector managers to feel that defining requirements is actually not leading to better accomplishment of business excellence needs further exploration.

The relationship between actions and business excellence implementation outcomes is moderated by ideation as per the literature review. However, this relationship is also absent as per the findings of Hypothesis 7. The planner and designer, therefore, need to refer to the employees and leaders concerned in the organization to test the proposed solutions to ensure that they are meeting their needs and expectations and will lead to achieve the desired objectives and affect the employees' actions positively. For this purpose, further exploration is needed to understand if ideas are really welcomed in the current work environment. Field observations showed that ideation was kept limited to the immediate work sphere for the employees during remote working. As a result, it is probable that business excellence requirements did not feature in the list of activities for the active deliberation and discussion of the workforce. Therefore, the results have not shown a relation as managers feel that such a focus may be taking away from the more pressing needs of the organization.

Moreover, the relationship between action and business excellence implementation outcomes was expected to be moderated by prototype after defining and understanding the root causes of the actions related to excellence implementation problems and achieving agreement about the right solutions, ideas, and initiatives with the users and implementers within the organization (Stoyanova & Iliev, 2017; EFQM, 2020). Action plans then need to be established for implementing the agreed solutions, ideas, and initiatives with clear responsibilities, implementation time frames, and the financial and nonfinancial needed resources. These action plans need to be discussed with all concerned within the organization to ensure that it will lead to meeting the needs and expectations in affecting the employees' actual performance of excellence

implementation requirements positively. Finally, the action plans need to be approved by the top management for starting the implementation and the monitoring and evaluation stage (Lasrado & Gomiscek, 2017; Nizamidou & Vouzas, 2020).

However, the findings of this study have gone against this suggested blueprint as prototype development is also found to not be influenced by the achievement of business excellence implementation outcomes. As in the case of the earlier determinants, field observations show that the priority, focus, and attention of the managers is not on business excellence framework with respect to the implementation of design thinking. As a result, any determinants that affect their focus are believed to not pull towards the designated objectives. With results indicating that the objectives of the managers in this period have changes, it is suggested that future researchers should revisit this issue and find if design thinking is really not an influencer for business excellence implementation.

Till then, it is important to remember that we are still in the grips of the pandemic with successive waves of the infection causing more disruption and uncertainty for business managers. This change of priorities is reflected in the trends identified by Gartner (2020) who has noted that the top five priorities for HR leaders should be building critical skills and competencies (68%), organizational design and change management (46%), building leadership capital (44%), deciding the future of work (32%), and building a better employee experience (28%). Therefore, the pandemic has made business leaders revisit the foundations of business management and ensure that the organization has the right talent for fulfilling its requirements. However, there is hope for business excellence as it has been named at the top for the business priority for 2021 (65%) much ahead of growing the business (64%) and executing business transformation (54%). The report, thus, shows that businesses will again reorient themselves towards improving their skills and competencies and

working towards excellence. In the meantime, the report notes that COVID-19 pandemic has definitely impacted the reskilling capabilities of the organization while more than 70% of the existing employee force needs to rebuild their skills. This is a highly illuminating trend which shows why the managers' focus has moved from business excellence to coping with the effects of COVID-19-related issues. Furthermore, only 38% of the 800 respondents in this study said that their employees were equipped to identify if they were performing well and able to fulfil the needs of their customers. This result shows that organizations need to invest much more in training and motivating their employees if they have to achieve business excellence.

These results all show that the absent moderation of design thinking is not a result which reflects expected trends and is indicative of the work environment and challenges thrown by COVID-19 pandemic. The question which remains unanswered is if this is the result of the pandemic then why has design thinking been found to positively moderate attitude and knowledge of employees towards business excellence. The answer for this question may lie in the difference in nature of attitude, knowledge, and actions. Managers agree that employee attitude and knowledge are moderated positively by design thinking determinants but when it comes to actions, they do not want employee focus to veer away from the more pressing issues. In any scenario, the results indicate the need for further research to substantiate the findings further.

6.8. Seventh Research Objective

The final research objective aimed to “provide a design thinking-based framework for effective business excellence outcomes in the public sector”. There were no hypotheses associated with this objective considering its conceptual aim. The findings of this research have proved that there is a strong positive relationship between the Excellence (attitude, knowledge, and action) and the excellence implementation outcomes. There is also a positive relationship between attitude and

excellence implementation outcomes moderated by design thinking and its determinants. Furthermore, there is a significant relationship between excellence and knowledge with business excellence implementation outcomes while actions are not found to be related.

The literature review, on the other hand, suggests that design thinking approach will increase the excellence implementation outcomes by generating innovative solutions. This expectation is created by the common features between business excellence and design thinking of a human-centred focus, seeking challengeable goals to meet specific strategies, and innovation being an essential part of both variables, the happiness of stakeholders and improving the life of human-beings being a critical focus area, technology being a vital tool to achieve a high level of positive results, are all critical success factors for both business excellence and design thinking (Bobrek, Majstorovic & Sokovic, 2006; Carlgren, Rauth & Elmquist, 2016b; Toma & Marinescu, 2018). Furthermore, user involvement, prototype usage, testing, experimentation and resources are needed for both business excellence and design thinking implementation. However, the mixed results of this study along with the practical experience of the researcher have been utilized to provide a design thinking-based framework for effective business excellence implementation outcomes in the public sector.

An important consideration for future researchers and practitioners is that gender is found to negatively influence both excellence and design thinking. This gap needs to be curbed so that both male and female managers are able to work towards better business excellence outcomes.

6.9. Critiquing and reflecting on Design thinking for business excellence

This study proposed to establish that design thinking and business excellence, that are two hitherto unexplored relationships, are indeed related. The findings of this study have shown that attitude, knowledge, and excellence are moderated by design thinking principles for achieving business

excellence outcomes. However, one of the hypotheses, H7, has failed to be significantly related to business excellence outcomes. As design thinking and business excellence have not been studied before in a research study, the framework adopted in this study has been supported through indirect evidence. This indirect evidence shows that all criteria of design thinking are accommodated in the business excellence models with human centredness, focus on strategy and goals, innovation, all finding support in studies linking them to improved implementation of design thinking and business excellence. In such a context, the rejection of hypothesis 7 merits a closer look at the reasons that may contribute to the finding that despite, attitude, knowledge, and excellence all supporting the moderating role played by design thinking, why is it that actions fail to do so?

The field observations of the researcher, who is a certified practitioner of design thinking, showed that it was the unprecedented disruption caused by the pandemic which shifted the focus of the UAE managers from business excellence criteria to those actions which needed their more pressing attention. This belief is supported by emerging literature support that shows the pandemic to have exerted widespread influence on the working of UAE organizations. Rehman et al. (2021) report several challenges including scheduling disruptions, impacted cashflows, late permits, travel restrictions, health stress, and shortages of equipment all of which affected the organizational functioning in the UAE construction industry. The MICE (meetings, incentives, conferences, and events) industry suffered significant challenges with travel restrictions and health concerns forming a formidable barrier against business operations (Aburumman, 2020). Cost of running projects and of acquiring labour went high prompting Al Mansoori et al. (2021) to say that the pandemic has affected the UAE industry in an unprecedented manner. In such circumstances, the physical functioning of businesses was disrupted, remote working had to be initiated and supported for employees, and personal and health problems of employees emerged as primary concerns for

employees and their managers. As a result, the focus of the managers shifted to surviving the changes necessitated by the pandemic rather than those actions that could help support business excellence outcomes.

This belief does lead to the question that if the managers were focused on the pandemic than how were business excellence outcomes positively related to actions when not moderated by design thinking? To answer this question, the researcher went back to the items of the questionnaire which have measured actions and design thinking. The items in actions enquired about stakeholder feedback, organizational support for employees, strategic decision making, excellence being a part of daily routine, IT support for excellence, organizational structure's support for business excellence, existence of a rewarding scheme, and a steering committee. On the other hand, design thinking criteria built on empathize where organizational support for the employees would feature, design implementation where organizational structure, IT support, and leadership support for business excellence could be accommodated. Therefore, design thinking actions did not fit into the immediate problems faced by organizations who were struggling to secure resources, personnel, and maintain continuity of their operations. For instance, IT support was kept busy in onboarding employees to the remote working environment. Leadership support was concentrated on maintaining business continuity. Organizational structure was made completely different by the new work environment. As a result, despite the findings showing that actions are not moderated by design thinking in this study, the results indicate, at best, a temporary shift in focus rather than a lack of evidence. This belief is supported by the positive evidence found for attitude and knowledge of the managers both of which are positively in favour of design thinking. It is only the actions that are temporarily focussed on different directions than business excellence.

6.10. Design Thinking framework for effective business excellence in the Public Sector

The elements of the provided framework were designed by compiling the results of this research with the business excellence implementation steps found in the literature and the researcher's field observations and practical experience in implementing different excellence models (EFQM, UAE 4th generation excellence system, DGEP, King Abdullah II Award for Government Performance Excellence and Transparency using design thinking phases of empathize, define, ideate, prototype and testing.

One of the important studies found in the literature was the model of Bolboli and Reiche (2013; 2014) which was originally developed for the private sector. It is a system-based model and is based on two chosen models of the EFQM excellence model (EFQM, 2020) and the Wuppertal Generic Management Concept (Winzer & Sitte, 2004). The incorporation of these models makes a lot of difference between this study's framework model and them, but the researchers have mentioned four steps for excellence implementation within the organization in their proposed meta- model which are start-up, planning and design, realization, and stabilizing which are critical to provide a blueprint. These steps have been incorporated for the study's framework into six steps. Furthermore, the results of implementation outcomes in this study and the benefits of implementation of excellence and TQM were also considered in forming the framework as the outcomes of the business excellence implementation are more effective when using design thinking determinants. This was in line with Al-Qudah *et al.* 's (2020) model presented in his study conducted for the pharmaceutical companies in Jordan. Al-Qudah *et al.* (2020) investigated the impact of implementing TQM for enhancing the companies' competitiveness level which was measured by the companies' profits, quality of services, effectiveness, and the market share. In this research, different measures than Al Qudah *et al.* 's (2020) study were used to measure the

business excellence outcomes as it targets the public sector organizations while the effective outcomes of business excellence implementation were the common features in both studies.

Moreover, this study's framework targets public sector organizations which are not beginners in the field of implementing business excellence models. For example, the Dubai government's excellence program started in 1997, King Abdullah II Excellence Award started in 2002, and Sheikh Khalifa Government Excellence Program was announced in 2009. All the public sector organizations participating in excellence awards have been following a valid business excellence model and have a history and experience of implementing excellence. Therefore, the framework provided in this study will build on what has already been done and does not suggest starting from scratch.

In this framework, the first step is gaining the management and employees' full support by emphasizing the needs of the users and implementers. One important thing in this stage is the establishment of implementation excellence teams which is recommended to be limited to one team for each criterion of the excellence model headed by the concerned division or department in the organization. These teams should consist of members from branches selected through certain criteria to perform the required tasks. In other words, this is the step of initial communication to develop empathy about the needs and expectations of the service users.

The second step is the diagnostic stage in which the analysis for the internal and external assessments reports will take place by analysing the business excellence model requirements that take in consideration the internal organizational context of employees' happiness and empowerment, organizational culture, continuous improvement, among others and the external context of stakeholders needs, expectations, and happiness. The analysis of external environment with economics, social, political, technological, legal and environmental components will be the

most important aspect of this step as it will help to clearly identify the situation of the organization as per the criteria of the followed excellence model. It will answer critical questions of what practices are in line with world-class best practices which need to be emphasized, what best practices exist as per the criteria which are not implemented and can be considered as an area for improvement (AFI), and what actions need to be converted to strengths. In other words, this is the step for gap analysis and definition.

The third step in the framework is to create alternatives, ideas, and initiatives for the efficient and effective implementation of business excellence in the organization based on the findings of data analysis and the information gathered in the previous steps. Therefore, it is the step of ideation.

In all steps, the planner and designer need to refer to the concerned employees and leaders in the organization to test the proposed solutions and ideas to ensure that they are meeting their needs and expectations. If needed, these solutions should be reformulated properly in order to achieve the desired results.

After defining and understanding the root causes of the business excellence implementation problems and agreeing on the right solutions, ideas, and initiatives with the users and implementers within the organization, the fourth step is initiated in which action plans are developed to implement them. In other words, it is the stage for developing prototypes and preparing action plans. The action plans should include the actions needed for implementation with clear responsibilities, the implementation time frame, and the required financial and nonfinancial resources. It is also necessary to discuss the action plans with all concerned within the organization to ensure that they achieve the needs and expectations of all stakeholders and are approved by the top management.

Throughout the implementation process it is very important to apply positive monitoring and evaluation processes aimed at correcting deviations by measuring the actual performance and comparing it with the targeted performance in work plans to meet the requirements of excellence implementation. This gap analysis is important for identifying deviations, investigating their causes, and taking appropriate corrective and preventive actions. Such actions can be accomplished by obtaining periodic reports on work progress in implementing the plans. One of the good practices at this stage that are highly recommended by the researcher and observed during data collection and work experience are the excellence coordination meetings which should be headed by the top management and employed to install excellence implementation team champions with all decision makers at one table. Such coordination will enable swift and decisive decision making for any implementation problems or obstacles in the same meeting to support the fulfilment of the requirements.

Finally, in order to be successful in reaching the most effective outcomes and sustaining the outstanding results, business excellence plans always need to be tested by the internal and external assessments with proper assessment tools that are included in any excellence model such as the EFQM, Baldrige and DGEP. Assessments are needed to ensure the effectiveness, efficiency, and continuous learning and development on the excellence scale. For this step, this study's framework provides a list of actions to prepare for the assessment to ensure the readiness of the presentations, videos, documents, and evidence, in addition to the need for educating and training the management and employees who may face the assessors. Using this evidence, the trained personnel will be better prepared about the right way of answering the questions and presenting the achievements of their branches and be ready for the preparation for mock-assessments and rehearsals. Moreover, any information, documents, evidence, or requirements requested by the

assessors during the assessment process will be ready as the assessor may ask any question, request any document, or question any employee for completing the assessment.

Furthermore, the post assessment stage is a very important milestone in which the management and teams utilize a clear assessment report containing the strengths and areas for improvements. During this step, the evaluation of the performance of the team members is carried out with the re-establishment of the excellence implementation teams based on the lessons learned in the implementation cycle. Subsequently, the steps are started again. Figure 6.1 illustrates the provided Framework:

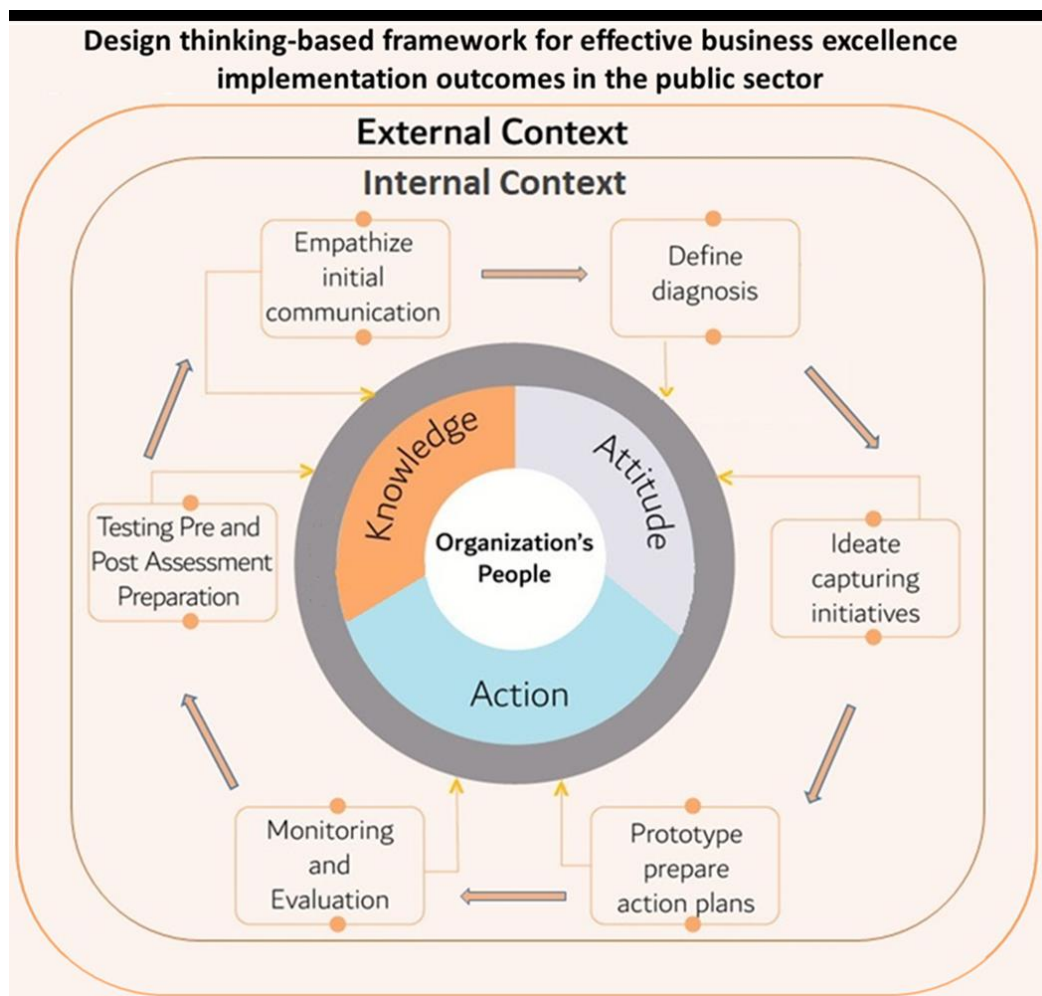


Figure 6. 1 Design thinking-based framework for effective business excellence implementation outcomes

The steps of the provided framework are shown in detail in the tables 6.1 to 6.7 attached to the appendix. The first step begins with the first determinant of design thinking which is empathize. This step is suggested to be achieved through initial communication between the various stakeholders associated with business excellence implementation. This first step in the design thinking-based framework is empathizing the most important needs of the employees (users) from their point of view. In this step, the real needs, obstacles and problems faced by the organization's employees in implementing business excellence requirements are explored. During this step, any prior assumptions are avoided in order to reach the root causes of the problems and obstacles without any barriers. The excellence planners should put themselves in the place of employees to plan and design the most effective actions, initiatives, and decisions that meet the needs, exceed expectations, and achieve all goals.

It is suggested that to meet all these objectives, many activities can be organized beginning with gaining the support of leaders and employees in the organization and then ensuring their effective participation in acquiring, understanding, and transferring the concepts and requirements of excellence. The leaders and the excellence champions then help others adopt the associated practices in their work.

It is important to communicate directly with employees at all levels through meetings, interviews and questionnaires to determine their real needs and point of view in the best ways to meet the requirements of implementing business excellence requirements. This direct communication will help identify the difficulties and obstacles they face and how to overcome them. Other activities include finding ways of building awareness about the concepts and requirements of excellence to

meet the needs of employees as per their point of view. Such identification of needs should be followed by the creation of a training calendar that provides support for meeting these needs.

Excellence champions (excellence unit or department, excellence managers or coordinators...) should also note any other suggestions and initiatives received by different official or nonofficial communications channels like emails, suggestion systems, face to face meetings, and toolbox talks. At the same time, the top managers should establish an excellence steering committee headed by the organization leader. They should further cement the organizational support by forming excellence implementations teams with each team headed by a designated leader according to the scope of the excellence model criteria.

The next step in the recommended framework is of diagnosis and identification of gaps which reconciles with the “Define” determinant of design thinking. In this step, all the information gathered in the previous step is integrated, merged, and analysed, to define all aspects of the needs, problems and obstacles faced by the employees in the implementation of the excellence requirements and collect their views to reach the implementation goals efficiently and effectively. The activities recommended for this step begin with the circulation of the latest criteria concepts, and assessment mechanism of the followed business excellence model, as well as the external and internal excellence assessments reports to all concerned in the organization.

Furthermore, the excellence champions and their teams should identify gaps, activities, and procedures to be implemented in the organization to work on the areas of improvements mentioned in the assessment reports. In addition to the activities, initiatives and ideas proposed by all internal excellence teams, departments, divisions and concerned leaders should be collated to emphasize the organization’s strengths in meeting the requirements. The excellence implementation teams should further conduct analysis of the organization’s internal and external context to determine

any areas of improvements outside the assessment's reports and within the scope of the excellence model criteria, based on the outcomes of the implementation in the previous cycles.

Lastly, the excellence champions and teams should collect, classify, and analyse the qualitative and quantitative data collected in the previous steps using the available methods. They should also discuss the findings with all concerned users and present the recommendations.

The third design thinking determinant of “Ideate” are captured by the step of capturing ideas and initiatives in the framework. This step includes the creation of alternatives, ideas, and initiatives for the efficient and effective implementation of business excellence in the organization based on the findings of data analysis and the information gathered in the previous steps. The planner/designer needs to refer to the employees and leaders in the organization to test the proposed solutions to ensure that they meet the designated needs. In this step, the recommended activities include the gathering of ideas and initiatives proposed by all stakeholders who affect and are affected by applying the requirements of excellence in the organization by the Excellence implementation teams and the Excellence champions.

Furthermore, the Champions and teams should join forces with the organizational leaders to discuss the gathered ideas internally with the organization's excellence teams' members and all important stakeholders and take any received comments into consideration and agree about the evaluation criteria. The evaluation itself should proceed with the captured ideas based on certain criteria and the identification of those ideas which are applicable and feasible. Finally, the organization should adopt applicable ideas and initiatives and identify the actions and resources needed to implement them for inclusion in later business plans.

The next step in the framework is for developing action plans which are in line with the “Prototype” determinant of Design Thinking. After defining and understanding the root causes of the excellence implementations problems, and agreeing about the right solutions, ideas, and initiatives with the users and implementers within the organization, in this step, action plans are developed to implement the agreed solutions, ideas, and initiatives. The action plans should include the actions needed for implementation with clear responsibilities, implementation time frame, and the financial and nonfinancial needed resources. These plans need to be discussed with all concerned within the organization to ensure that they will help meet the needs and expectations of all stakeholders. They will also be more likely to be approved by the top management.

The activities recommended for this step begin with the development of an action plan that meets the requirements of business excellence implementation based on the gap analysis and diagnosis conducted in the previous stage. The Excellence implementation team should ensure that these action plans include the right activities to implement the agreed solutions and initiatives with specific responsibilities, measurable outcomes, and a specific time frame. The teams with the Champions should then review the action plans internally with the implementation team members and the excellence champions to ensure the initiatives will meet the excellence implementation requirements.

Further activities should include a discussion of the developed action plans with all concerned in the organization (leaders, employees) and noting any comments about the plan into consideration to ensure it will meet all needs and expectations. The final activity should be the presentation of the action plans in the top management meeting to gain their full support.

The next step in the recommended framework is for monitoring and evaluation. In this step, the Excellence champions should apply positive monitoring and evaluation processes aimed at

correcting deviations by measuring the actual performance and compare it with the targeted performance in work plans. This step will, therefore, help to meet the requirements for excellence, identify deviations, research their causes, and take appropriate corrective and preventive decisions. It will also help to obtain periodic reports on work progress while implementing the plans. Within this step, the recommended activities for the Excellence Champions include the follow up implementation based on the approved action plans and the review of any change requests to modify the action plans with the excellence implementation teams. These activities will help to recommend the amendments as per the rules. Based on these activities, the Excellence Champions and the teams can submit periodic reports from the excellence implementation teams on the progress of the action plans after discussions with the excellence champions who, collect, integrate, and submit the final report to the head of the excellence steering committee.

Some more activities in this step are to conduct periodic excellence coordination meetings as agreed and whenever the need arises, headed by chairman of the excellence steering committee, and all the excellence implementation team heads, and the divisions' heads. In this meeting, each team head presents what has been achieved by his team, any implementation problems faced or issues needing an immediate decision from the steering committee.

The next step in the framework is of the "Testing" determinant of design thinking where the pre-assessment preparation for business excellence is rolled out. This step measures the effectiveness outcomes of the initiatives, ideas, and solutions implemented in the previous steps. The implementation excellence teams and excellence champions prepare the presentations and videos representing all the latest achievements in line with the requirements of the followed excellence model. They also prepare the related documents and evidence in one place with a clear description of the documentation process, ensuring ease and quick accessibility for the presenters during any

internal or external assessment. They further conduct a preparedness or rehearsal assessment to ensure the readiness for all personnel for any coming assessment. Finally, they provide any information, documents, evidence, or requirements needed by the assessors during the assessment process and focus on including all achievements that add value to the assessment report by taking the help of the top management.

The final step in the provided framework is of post assessment and feedback which is also a part of the testing determinant of design thinking. This step measures the effectiveness of the outcomes of the initiatives, ideas and solutions implemented in the previous steps, and starts abovementioned steps again for the next assessment cycle. The activities recommended in this step include the circulation of the assessment report to all concerned and implementation excellence teams within the organization to illustrate the strengths and clarify the areas for improvements and the details of the assessment report. Furthermore, the Heads of all departments and excellence teams update the excellence team's implementation action plans based on the received assessment reports (internal or external) in order to raise the organization's excellence maturity level by utilizing the areas of improvements and to emphasize the strengths according to the report. These activities will promote benchmarking of areas of improvements with other similar organizations for converting them to strengths according to the identified best practices. Finally, the top management re-establishes the excellence teams based on the implementation outcomes, and starts the steps again. A discussion of the strengths and areas for improvements of the framework in the context of the public sector organizations are furnished below.

6.10.1. Strengths of the framework

- 1- This is the first design thinking-based framework to be developed for business excellence implementation specifically for the public sector. As a result, it has incorporated the specific needs of the sector.
- 2- The framework incorporates design thinking determinants to provide guidance for implementers at each stage. This is the most critical advantage over existing models. By building empathy, definition, ideation, prototype development, and testing at every step, leaders are in better position to achieve business excellence.
- 3- The framework is human-centred as the attitude, knowledge, and actions of the organizations' people are included in the core structure of the framework. Though people form a part of the EFQM and workforce in the Baldrige Excellence Framework, they are a critical part of this framework where empathy for their views is inbuilt in each step.
- 4- It identifies the current context of the public organization to clearly define the needed actions for improvement with relation to the business excellence criteria and assessment scale. This addition of the analysis of the internal and external context of the organization supplies a unique advantage to its implementers who are better informed about environmental requirements and internal capabilities.
- 5- The framework highlights the importance of having excellence champions for coordination, integration, coaching training, motivating, and facilitating the work of the implementers. Excellence champions may be individuals, teams, sections, offices, or departments based on the nature of implementing organization or the level of implementation (sub-division or branches). Therefore, it is more flexible and adaptive than the existing frameworks in business excellence.

- 6- The framework is applicable for any public organization following any excellence model. The proposed actions and responsibilities mentioned for fulfilling each stage of the framework can be customized to fit with the context and situation of any public organization.
- 7- As per the findings of the study, using the design thinking-based framework will increase the effectiveness of the excellence outcomes in the public sector organizations by contributing to the positive attitudes and knowledge of the employees. This contribution will help achieve the organization's vision of a higher position in the ranking among the global competitiveness indices.
- 8- The sequence in the mentioned steps for the framework is provided in a manner that makes it easier for leaders to implement the required changes. In fact, each stage is explained in terms of steps that should be taken which bring in much better clarity to the process than earlier models.

6.10.2. Areas for improvement

- 1- This framework will be successful only after the full adoption and support from the top management. This is an essential criterion as business excellence and design thinking determinants are both demanding and exhaustive phenomena that need resources, permissions, and commitment of the management and leadership.
- 2- The framework may not be applicable for the private sector organizations to the same extent as the public sector. The results of this study have emerged from the responses of senior managers of the public sector which implies that its applicability to the private sector needs to be investigated.

- 3- The framework is developed for institutional excellence category and not applicable for team and individual excellence categories. This is a limitation and needs further studies to clarify the ways individual and team competitiveness can be enhanced in the business excellence awards.

6.11. Robustness of the Research Methodology

The research methodology employed in this study has been illustrated in detail in chapter three. The researcher has adopted a quantitative research approach to collect data from the public sector employees using a questionnaire survey which is better suited for this context as this research combines complex topics of excellence outcomes and design thinking in which require deliberation. Moreover, the nature of this research demanded inputs about excellence implementation in the public sector from different organizations and from senior level employees within the same organizations. Taking into consideration the nature of the research population (Dubai public sector organizations) which contain a high level of diversity, the necessity of deploying the research approach in a cross-cultural setting was felt as mentioned by Bückner and Korzilius (2015). In addition, the researcher aimed to have the findings of this research generalized which was the guiding decision behind adopting a pragmatic research philosophy with an abductive approach.

The research methodology was established as a result of a thorough review of the available literature in order to investigate the interactions between the research variables mentioned in the conceptual framework where the variables were systematically constructed in a way that illustrated the expected relationships and the projected direction of the relationships between the variables. This theoretical framework has been shown in figure 3.4.

Furthermore, the sample was aimed to be representative of the population in terms of experience, educational background, and gender. This representativeness is usually achieved through simple random sampling, however, this study had to resort to convenience sampling to gain access to senior managers who were involved in business excellence. The sample size was decided using the recommendations of Kline (2005a) who suggests 10 observations per studied variable with a minimum threshold value of 100. As this study contained four independent variables of attitude, knowledge, actions, and excellence with a moderating variable of design thinking with five phases of empathy, definition, ideation, prototype, and testing; it was the minimum threshold value which was higher. The final sample size was observed to be 141 after disregarding incomplete entries. The representativeness of the sample, therefore, was achieved through the quantitative approach which targets wider range of participants than other approaches in an efficient and effective manner. Care was taken to use an unbiased instrument which gives an equal opportunity to all the targeted participants. Moreover, the participants were encouraged to participate by giving them the freedom to participate and exit anytime.

Accordingly, the researcher developed a questionnaire as the primary data collection tool for the research and then analysed the data for testing the research hypotheses and answering the research questions. The questionnaire was validated through several procedures which included developing the questionnaire according to an extensive literature review in the studies in the fields of excellence, TQM, and design thinking. The questionnaire was ratified through expert opinions elicited through the Delphi technique in order to ensure its validity or to make sure that it measures what it planned to measure. In order to raise the external validity, the entire public sector community of Dubai was targeted as a population for this study, the questionnaire was designed in the format of an online solution and shared through email for all respondents a part of the sample

in its government entities. One limitation affected the questionnaire which was the inability to test the instrument for internal reliability before using the questionnaire. This limitation occurred as the pilot study sample was only 10. A digital version of the questionnaire was shared through email along with a cover letter. The support of Dubai government excellence program for this research was highly appreciated to reach the concerned in Dubai public organizations. Finally, the research methodology was built to fulfil the abovementioned research needs and requirements.

In order to prepare the questionnaire for further analysis, the scale of measurement and to ensure that the collected data is sufficient, valid, and consistent, the researcher used SPSS (statistical package for social sciences) to conduct initial data screening and testing. It is in this testing that 141 questionnaires were found to be complete and acceptable out of the 145 initially received questionnaires. Based on the accepted responses, the demographical analysis assured that the targeted sample is representative of Dubai's public sector providers well.

The analysis for the accepted data took place beginning with the reliability test to establish the pilot study using 10 questionnaires for which internal consistency was measured and compared using Cronbach's alpha values. The descriptive statistics were ascertained next to describe the research sample's characteristics and the differences between the responses. Moreover, the normality tests were conducted which ensured that the data scores represented the population well and were not affected by extreme scores (Creswell & Creswell, 2017).

The proposed relationships between the research variables were investigated using SEM modelling which began with the establishment of the convergent and discriminant validity of the two model. The two models measured the direct effect of the independent variables of attitude, knowledge, actions, and excellence on business excellence implementation outcomes and the moderated effect

of these independent variables as influenced by design thinking and its determinants of empathy, definition, ideation, prototype development, and testing, respectively.

The results of the two models proved that there are strong significant positive relationships between each independent variable (attitude, knowledge, and action) and the dependent variable business excellence outcomes, the same was applicable for excellence (attitude, knowledge, and action all together) and dependent variable. However, the relationship between the independent variables and the business excellence implementation outcomes when moderated by design thinking and its determinants were mixed. While design thinking and its determinants did positively moderate the effect of attitude, knowledge, and excellence on business excellence implementation outcomes, it did not have any effect on actions and excellence. Furthermore, it positively influenced excellence and its relationship to business excellence implementation outcomes. Therefore, the methodology followed in this research has resulted in the approval of the direct relationships between the research variables while leaving a number of questions for further discussion.

6.12. Contributions

This study provides several contributions to the academic field and to the practice of business excellence as the first exploration of design thinking in the field of business implementation in the public sector. The academic and practical contribution of this study is presented in the following section.

6.12.1. Academic contributions

The evidence of this study's contribution to the academic discipline is that:

- This is the first study to investigate the influence of design thinking determinants on business excellence implementation outcomes in the public sector. Therefore, it reflects an attempt in

the right direction to build a theory related to business excellence implementation and design thinking which are two constructs with several similarities as indicated by existing literature but no research attempting to link them together.

- The literature review in the field of business excellence implementation and the use of design thinking in the public sector has shown a research gap indicating the need to conduct more empirical research. As mentioned in chapter 1, the few researchers who have explored this field have indicated that the existing studies that have investigated the implementation of TQM and business excellence models have only focused on the situation of private sector (Motwani & Kumar, 1997; Tari, 2006). Hence, this research participates in extending the empirical research in those fields to the public sector and contribute to fill the gap in the literature.
- This study has defined the importance of the role of motivated employees for achieving business excellence which will raise the importance of the use of the principles of behavioural sciences to motivate the individuals and teams in the field of business excellence implementation. The findings have also indicated that the leader actions of facilitating communication and linking performance and reward management to business excellence strategy are important for achieving the business excellence requirements.
- This study has further substantiated that the attitude of the employees plays a significant role in the effectiveness of business excellence implementation outcomes in the public sector. This role of attitude is moderated by design thinking and its determinants. This concern is not demonstrated as such in the literature and has only an indirect relation through the sharing of common characteristics. This research is, therefore, considered the first to investigate the role of this variable in the field of business excellence in the public sector.

- The researcher has shown that the knowledge of the employees plays a significant role in the effectiveness of business excellence implementation outcomes in the public sector. Furthermore, this role of knowledge is found to be significantly moderated by design thinking and its determinants. This research is considered to be the first to investigate the role of these variable in field of business excellence in the public sector.
- This research has shown that the actions of the employees play a significant role in the effectiveness of business excellence implementation outcomes in the public sector. This role of actions is not moderated by design thinking and its determinants. This is another concern not yet demonstrated in the existing literature. This research is considered the first, therefore, to investigate the role of this variable in the field of business excellence in the public sector. The absence of influence of actions when moderated by design thinking may also be attributed to the effect of COVID-19 pandemic on organizational working and may need further research to ascertain its permanency and the causes behind it.

6.12.2. Empirical contributions

This study provides several empirical contributions which are:

1. This study provides an empirical framework for business excellence implementation in the public sector organizations with a clear suggested action plan based on literature and practical experience which shows how to implement business excellence requirements using design thinking determinants. In the field of excellence, a lot of arguments are seen about what needs to be done in order to achieve a high level of performance. The ideal excellence criteria (i.e., EFQM criteria, DGEP criteria, MBNQA criteria, etc.) are best practices that need to be followed by implementers but the steps and methodology that show how to

implement the excellence requirements are very rare, particularly, in the public sector. This study fulfils this research gap.

2. This study proves that the attitude of employees which shows their willingness to perform requirements plays a significant role in effective business excellence outcomes and that this role is moderated by the design thinking determinants. The study also provides an empirical guidance of how to raise a positive attitude using design thinking, starting from empathizing with the problems and the people to include the employees' point of view to clearly defining all aspects of the situation by gathering the right information from the right people, through ideation, planning (prototype) the initiatives and solutions to testing the real implementation.
3. This study proves that the knowledge of employees which signifies the ability to perform requirements plays a significant role in effective business excellence outcomes. The study also provides an empirical guidance of how to raise the knowledge about business excellence requirements. It further shows that the design thinking determinants positively moderate knowledge in its positive relationship with business excellence implementation which suggests that the knowledge management can help achieve business excellence outcomes even in the current work environment where the pandemic has dramatically altered working conditions.
4. This study proves that the actions of employees which depict the actual performance of the requirements plays a significant role in effective business excellence outcomes, and this role is not affected by design thinking determinants. The actions of employees have been found to be not moderated by design thinking which is against currently available literature. This study's findings, therefore, show that the current work environment has seen changes due to the pressure of COVID-19 pandemic. In such circumstances, the physical functioning of

businesses was disrupted, remote working had to be initiated and supported for employees, and personal and health problems of employees emerged as primary concerns for employees and their managers. As a result, the focus of the managers shifted to surviving the changes necessitated by the pandemic rather than those actions that could help support business excellence outcomes. Such an impact needs a different study focus to confirm the same. Moreover, the results of a lack of moderation relationship between actions and business excellence requirements also needs further evidence.

6.13. Comparison with Earlier Models

The comparison with earlier models is made by amending table 2.1 which had presented a summary of the updated EFQM model 2020, Malcom Bridge model, and the UAE 4G Excellence Model. These comparisons are now contrasted with the model prescribed by this research. Table 6.8 is attached to the appendix and its gist is presented here.

The criteria in the EFQM model of 2020, the Malcolm Baldrige Model, the UAE Excellence Model, and the Design Thinking-based business excellence framework provided in this study share many features. For the EFQM model of 2020, there are seven criteria grouped in three pillars, Direction Execution and results while the Malcolm Baldrige Model also prescribes Seven criteria within the themes of Leadership, Strategy and HR which are similar to EFQM. The UAE Excellence Model is also similar with Nine criteria revolving around HR, and Asset and Resources similar to EFQM. The Design Thinking-based business excellence framework provided in this study proposes six steps for the implementation of any of the previously followed excellence models which may be EFQM or the UAE BE Model in order to positively contribute to the business excellence outcomes as proved in the findings of the study. The difference exists in

placing people at the centre rather than as a factor and in placing attention on their attitudes, knowledge, and actions.

The focus of the EFQM model is on the supportive processes and services while the Malcolm Baldrige Model also emphasizes the same. The UAE Excellence Model places more emphasis on core processes and services of the public organizations. The Design Thinking-based business excellence model provided in this study places the highest emphasis on the people of the organization. It believes that channelizing their knowledge, attitudes, and actions demands the most attention. Internally, the phases of empathize, define, ideate, prototype, and test are suggested to focus energies on business excellence outcomes. The overall scores for the EFQM model of 2020, the Malcolm Baldrige Model, the UAE Excellence Models are set at 1,000 but for the Design Thinking-based framework provided in this study the score will be determined as per its application.

The scoring weightage for EFQM is set at 200 for direction, 400 for execution, and 400 for results. For the Malcolm Baldrige Model, scoring is 45% for the results criterion, 12% for leadership criterion, 9% for integration criterion and 8.5% for each of the remaining four criteria. Higher weights reflect more importance of a criterion. The UAE Excellence Model set scoring with each criterion consists of capabilities part weighted 30% of the criterion weight, and results part weighted 70% of the criterion weight. Weights of each criterion are dependent on the difference and privacy in the nature of the work of the government organization. For the provided design thinking framework, scoring weights will also be determined as per the application in each organization. The scoring weights should flow from the core focus areas and critical success factors. It is suggested that scoring should follow the pattern of results 70%, capabilities 30% in

line with the UAE 4G Business Excellence model. The weights within results and capabilities should place a higher priority to human focus.

The integration of these models into the organizations is achieved in different ways. For the EFQM model, the role of integration is within the “organisational culture & leadership” criterion in the direction pillar. For the Malcolm Baldrige Model, the integration criterion is the core of the model in addition to leadership criterion. In the UAE Excellence model, the integration part is not clear. The provided design thinking framework suggests that knowledge, attitudes, and actions of employees have to be integrated along with the internal and external factors associated with the organizational environment right from the beginning. The leaders of the organizations should ensure the integration between all the components of the framework. One of the phases added to the five determinants of design thinking is the step of monitoring and evaluation (Figure 6.1). This step includes the excellence coordination meetings and the reporting of the progress towards action plans as mentioned above in the illustration of the framework.

Furthermore, the interdependence between criteria is also compared for these models. For the EFQM model of 2020, the results criteria are enabled by the Direction and Execution criteria and the causality relationship is clear. For the Malcolm Baldrige Model, the integration criterion serves as ‘brain centre’ for linking the operations with the strategic objectives. In the UAE Government Excellence Model, though the causality between the capability and results within each criterion is mentioned, the interdependency between the criteria of the system is not made clear. Lastly, for the Design Thinking-based business excellence framework provided in this study, being a highly integrated model, interdependency in criteria is suggested to be kept high. However, the linkages between design thinking and action is not substantiated. Further research is needed to make these linkages clearer.

The view of corporate social responsibility, an important construct is also varied between the models. For the EFQM model of 2020, the society perception results are part of “Stakeholders Perceptions criterion”. A score of 200 for the perception results of all stakeholders measures the results for the Customers, People, Business & Governing Stakeholders, Society, and the Partners & Suppliers. For the Malcolm Baldrige Model, CSR is mentioned as one of the fundamentals of the model but not clearly included in the criteria. For the UAE Excellence Model, the social responsibility is part of the sustainability (economic, social and environmental), more applicable for the governmental organizations as it is not allowed to provide anything out of their scope of work.

Finally, the Design Thinking-based business excellence framework provided in this study, corporate social responsibility is not considered to be within the purview of the existing framework. It is, however, possible for leaders to choose to represent corporate social responsibility in their core attention areas and reflect on their success factors associated with them. The human centred core of the model also lends support for the ability to volunteer and galvanize support for social cause.

The next criterion of comparison between the models is in their purpose. The EFQM model of 2020's sets its purpose at promoting the competitiveness for European companies and manufacturers in the world market by adopting and implementing excellence concepts. The Malcolm Baldrige Model seeks to promote competitiveness through TQM. The UAE Excellence Model's purpose is to consider the nature and specific type of the government apparatus and serve the strategic needs of the public sector. The Design thinking based business excellence framework provided in this study believes its purpose is to prescribe a framework fit for the public sector

organizations which allows them to implement business excellence in better guided and hence, clearer terms.

The type of organizations suited for EFQM model of 2020 are private organizations without any relation with each other. For the Malcolm Baldrige Model, it is private and semi-private organizations without any relations with each other. The UAE 4th Generation Government Excellence Model believes it is suited to any public organization and is the first to be developed for the public sector worldwide to perform combined national agenda or common government plan, and the Design Thinking-based business excellence framework provided in this study is best applied to public sector organizations which wish to implement business excellence to become more responsive, agile, and successful.

For the Assessment mechanism, the EFQM model of 2020 chooses the RADAR logic for linking cause and effect through direction and execution versus results. The Malcolm Baldrige Model applies check lists for ensuring the implementation of the model requirements. The UAE Excellence model chooses results and capabilities assessment. The researcher, however, recommends that it should be the decision of a particular organization's leaders to identify the assessment tool according to the excellence model they plan on adopting and implementing. The framework does recommend that RADAR logic should be applied within any of the chosen frameworks as it is the most comprehensive construct for linking results with the approaches.

For the qualifications of the assessors, the EFQM model of 2020 chooses the excellence assessors who are EFQM certified without taking in consideration the nature of experience or academic qualifications. The Malcolm Baldrige Model chooses excellence assessors who are trained in the requirements of the model criteria without taking in consideration the nature of experience or academic qualifications. For the UAE Excellence Model, assessment teams of subject matter

experts covering the core functions and the supportive processes are applied. The Design Thinking-based business excellence framework in this study, a cross-functional team of subject matter experts who understand the organization's context, operations, market, and its needs is recommended.

The EFQM model of 2020 is designed by the European Foundation for Quality Management (EFQM), the Malcolm Baldrige Model is designed by the National Institute of Standards and Technology NIST, the UAE Excellence Model is designed by the UAE government to serve the public sector, and the Design thinking based business excellence framework provided in this study is designed by the researcher based on the results of this study, the existing scholarly knowledge, and the accumulated wisdom of existing models of business excellence.

This comparison has shown several differences and commonalities between the popular business excellence frameworks and design thinking-moderated framework of business excellence. The focus in this framework is firmly on the people of the organization and, to a certain extent, on the stakeholders. It is the people's knowledge, actions, and attitudes that have been showed to have a positive and strong relationship with business excellence implementation outcomes. Therefore, the focus is on the core of human capital and not on treating them as any other criteria considered in the EFQM, MBNQA, or the UAE 4G Business Excellence model. The second difference is that the paper suggests that design thinking determinants of empathize, define, ideate, develop prototype, and testing should be employed to realize the human-centred focus of the framework. Though the results have not been entirely positive, the prevailing conditions of the work environment as discussed in earlier sections, still provide sufficient evidence to suggest that design thinking does have a prominent role to play in realizing business excellence requirements.

The scoring and the scoring weightage for the present model is not included in this study. There are two major reasons for this decision. The first reason is that the provided framework is designed to inform how organizations can fulfil the requirements of any followed excellence model and raise their total scores in the excellence model ruler, so the scoring is not applicable for this framework. It should be noted that the raised excellence scores after the adoption of the provided framework are an indicator of the framework's effectiveness. It has not, however, implemented the final model to seek results in the outcomes through experimentation or longitudinal results. Such changes are possible only when organizations take up the model, implement it for a sufficient period of time, and provide evidence through knowledge sharing to improve and refine the model further.

The second reason for not choosing the scoring and the weightage is the earlier evidence and the field observations which show that a uniform standard for all organizations is not recommended. Results and prior literature strongly recommend that managers should enlist support of top management, choose their own critical success factors, and then decide the path towards business excellence. For the public sector which follows bureaucratic structures and may face internal resistance and barriers for implementing design thinking determinants, the need for this independent decision and progress towards business excellence is all the more necessary. The path, factors, and framework are definitely recommended as per the results of this study but the actual choice of how to weave the factors together in a functional model is left for the managers' discretion. In fact, it is further recommended that managers should make this decision after involving key stakeholders so that they are also engaged throughout the process. Unless these measures are taken, the researcher is of the opinion that business excellence may fail to make an appreciable difference to the functioning of interested public sector organizations. The role of the

framework is to prescribe the broad areas where changes must be initiated and attention should be directed but beyond that which specific actions should be initiated, what attitudes can be harboured, and how knowledge sharing, and management can be initiated are areas that need the discretion of the stakeholders and their managers.

The integration of business excellence models is one of the core areas suggested in EFQM and MBNQA while it is not included in the design of the UAE 4G business excellence model. The design thinking-enabled framework suggested in this study also considers integration with the existing organizational framework to be an important and critical aspect of ensuring its success. In order to achieve this integration, three levels are suggested. The first is the internal and external context of the organization which again asserts the need for specific reflection and deliberation to decide the critical success factors and goals for each organization based on its needs. The internal context then integrated the phases of design thinking to implement the strategy and critical success factors. Moving towards the core, the knowledge, attitude, and actions of the employees are integrated within the decided policies and practices to realize the strategy. Therefore, the entire model is presented as an integrated whole with several levels of sensitivity to make sure that changing customer and investor demands, employee needs, and organizations systems can all be accommodated in an agile manner.

The interdependency of criteria in the present framework is not as clear as the other models. The results of this study are based on a data collection that happened during the COVID-19 pandemic-induced artificial work environment. This artificial work conditions are believed to have contributed to the anomalous absence of a relationship between actions and business excellence implementation outcomes when moderated by design thinking determinants. On the other hand, knowledge and design thinking determinants are found to have a significant relationship. These

relationships have a lot of intuitive connection with indirect support from literature as both design thinking and these independent variables have several commonalities.

As mentioned above, though the assessment criteria can be chosen as per the organizational leaders in the excellence model to be followed by the organization, however, the assessment criteria of the suggested framework are recommended to follow the RADAR (R refers to Results, A refers to the approach, D refers to deployment, and AR refers to assessment and refinement) logic which can link results with assessments and approach. This assessment criteria have been chosen as it is the most comprehensive with clear guidelines about how to approach assessment in a step-wise gradual manner which allows the organization to achieve its objectives. The RADAR logic depicted in figure 2.4 shows the steps of assessment and refinement through measures, learning and creativity, and improvements which are followed by the results which are measured under two broad categories of relevance and usability and performance. Based on the results, a sound or integrated strategy is chosen and implemented immediately or through a systematic process. The advantage of this RADAR logic is that it puts the onus of choosing the right mix of assessment criteria on the managers who have to judge their performance and context before choosing the right alternative. Though the RADAR logic does not offer a mix of choices possible in each category like the segmentation of relevance in results, it still clarifies the precise areas for the attention of the managers. The Design Thinking-based business excellence framework is proposed with a view to allow the public sector's managers to gain empathy with the requirements of business excellence and choose those decisions which lead them onto a direct path towards their success. This is why the RADAR logic is best suited to support the realization of the model. Practically, the leaders will clearly identify the targeted scores and any desired outcomes in the coming assessment cycle based on the organization's achievement in the last cycle which will

become the targeted results in the RADAR logic. Then they will identify all the enablers needed to achieve the targeted results, empower excellence teams, energise skilled excellence champions, gather financial and nonfinancial resources, and accrue approved action plans which are the approach part of the RADAR logic. Further, during the implementation phase, the monitoring and evaluation processes take place with corrective and preventive actions to ensure the achievement of the desired results which are also a part of the assessment and refinement part of the RADAR logic. The overall effectiveness of the design-thinking based framework for implementing excellence in the public sector organization is measured by the achievement of the targeted score and outcomes.

There is a demarcation between EFQM and MBNQA, and the UAE 4G business excellence in the requirements for the qualifications of the assessors. Whereas the former two prescribe experts in the field of excellence, the latter suggests that a team of subject matter experts should be assigned the task of assessing the implementation of business excellence. In the first case, it is possible for assessors to be expert in business excellence but not understand the context of the public sector organizations or even the cultural and market-related context of the organizations which can affect their judgment. In the case of subject experts, it is possible to choose a team of assessors who come from the same industry, geographical location, or type of organization which can make it easier for the organization to not only complete the assessment but also to understand how to address their weaknesses and how to learn from best practices or solutions employed by them before.

6.14. Recommendations

In line with the results of this study and in order to enhance the business excellence implementation outcomes and tackle the problems and challenges facing effective implementation, all the previous proposed critical points need to be taken in consideration in addition to the following implications:

1. The management and leadership in the public sector need to positively influence the attitude of employees towards business excellence implementation requirements. This positive influence can be achieved by empowering the employees and motivating them with financial and non-financial incentives. The employees need to be proud of their organization's success and feel that the excellence requirements are not any additional work but a part of their performing the jobs in an excellent manner. This study, in line with other literature, highlights the critical role of the organizations' leadership commitment to create an excellence culture and support the implementation teams by providing them with the needed authorities and resources for proper performance.
2. To positively influence the attitude of employees towards business excellence implementation in the organization, the researcher recommends the utilization of the design thinking determinants. Design thinking provides an effective approach to deal with both problems and solutions in collaboration with different stakeholders which is a representation of an innovative social change (Brown & Wyatt, 2010). Thus, recommendations to positively influence the attitude through design thinking determinants by empathizing the best way of affecting the employees attitude from their point of view, clearly defining all aspects that affect the attitude positively, collecting the right information from the right people, ideating and capturing the alternatives and solutions, planning the initiatives and solutions into prototypes and then implementing and testing them can yield more effective business excellence implementation outcomes.
3. The management in the public sector organizations needs to provide the employees with the right knowledge about business excellence implementation and enhance the employees' ability to perform requirements. This can be done by learning from

implementation experience and success stories and embedding excellence requirements within routine work knowledge. Leaders need to clearly understand the difficulties facing excellence implementation and to provide the employees with the needed training needed (Aladwan & Forrester, 2016). Moreover, the leaders need to ensure mutual understanding of excellence implementation requirements across all organizational levels.

4. To raise the knowledge of employees about business excellence implementation in the organization, the researcher recommends utilizing the design thinking determinants. This recommendation is made due to a significant relationship identified in this research. There is evidence from earlier research that to solve a big problem using a predictive approach will not work including defining, analysing, and the sequence of serial stages (Rittel & Webber, 1973; Dorst, 2011). The alternative, therefore, is the design thinking-based practices as per the opinions of several researchers (Buchanan, 1992; Dorst, 2011; Cross, 2018). Design Thinking offers a key path of empathizing the way of affecting the employees' knowledge from their point of view, and clearly defining all aspects that are affecting the employees' knowledge positively collecting the right information from the right people, ideating and capturing the alternatives and solutions, planning the initiatives and solutions into prototypes and then implementing and testing them can yield more effective business excellence implementation outcomes. Furthermore, the researcher's field observations have shown that there is a definite change in work environment, leadership priorities, and work practices which necessitate change in managerial approach to meet business excellence requirements. In such circumstances, it is recommended that leaders take cognizance of earlier research and use design thinking determinants to positively influence the knowledge of employees.

5. The management in the public sector need to motivate the employees' actions related to business excellence implementation and enhance the employees' actual performance of the requirements. This positive influence can be achieved by developing the right policies to achieve excellence objectives and by taking decisions at the strategic level to fulfil business excellence requirements. Furthermore, the actions for excellence implementation need to be embedded in daily work to ensure that the structure supports excellence implementation and the IT systems well. Having a reward scheme for the implementation is highly recommended to motivate implementers. This recommendation is supported by the data as the respondents were found to strongly agree that having an excellence steering committee will support the actions related to excellence implementation.
6. To improve the actual actions of the employees related to business excellence implementation in the organization, the researcher does not recommend utilizing the design thinking determinants. The results of this study have not shown a significant relationship between design thinking moderated actions and business excellence implementation in organizations. Though field observations have shown that this result may be related to the changes in work policies, priorities, and practices due to the ongoing pandemic, the lack of a relationship should not be ignored until further research is able to confirm the findings to be influenced by temporary changes or to be proved right.
7. The proposed framework of design thinking-based model of business excellence has offered an integrated system with three levels of the external and internal context, the five phases of design thinking, and the core of the people-centred and knowledge, attitude, actions of the employees. This integration has clarified the areas which need the attention of the top management and the leadership but has still left a lot of opportunity for individual

decision-making. In fact, the framework prescribes and recommends that managers should forge their own paths with precise factors and criteria that for their organizational context. As a result, it is recommended that managers take stock of the challenges affecting their organization's performance, the opportunities in their environment, the strengths and weaknesses within the organizational system and then decide the business excellence strategy. Furthermore, this strategy must be ratified through communication with internal and external stakeholders so that they not only remain engaged, however, their valuable experience and insights can also benefit the formation of the strategy. Once this strategy has been decided, the managers should decide the areas that need more attention as per the strategy. These areas should be kept as specific as possible so that the workforce can work together to achieve the desired outcomes. Specific areas will make communication clearer with a better idea of what has to be achieved, when, and to what specifications. Finally, a list of critical success factors should be chosen so that the organization focuses its attention to measurable and achievable outcomes which will have the maximum impact on the business excellence outcomes. This list should then become a part of the assessment criteria and the scoring of the same.

6.15. Recommendations for further research

- Researchers should study employee attitude (willingness to perform requirements) in different aspects affecting the organizational performance. These aspects can include though not be limited by strategy implementation, innovation management, knowledge management, process management, internal audit, artificial intelligence, agility management, resilience and risk management, and project management. In order to investigate if employees' attitude towards each topic is affected by design thinking as per

the results of this study, the design thinking approach can be generated to be used in dealing with both the problem and the solution aspects to enhance the expected outcomes.

- The same recommendation as above is applicable for knowledge (ability to perform requirements) and actions (actual performing of requirements). In these cases, the moderation effect of design thinking determinants needs to be explored afresh so that the findings can be substantiated with a workplace environment which is more stable, less uncertain, and free from fear of losing jobs and salaries.
- Leaders are responsible to create an enabling culture for business excellence in their organizations. However, they have little guidance about how to approach its requirements and ensure their implementation. The aspects of measuring an excellence-based organizational culture and its relationship with business excellence outcomes is, therefore, a recommended area for future research.
- The role of IT systems in supporting business excellence implementation is another recommended area for future research with investigation into the effect of design thinking which is expected to expand the excellence implementation horizon using new information technology while maintaining the people-focused aspect of the excellence and design thinking.
- The proposed framework provides an opportunity for the future researchers for development and extension of business excellence. The framework was developed for business excellence implementation in the public sector, therefore, the possibility for other researchers to extend it includes the private and semi-private sectors which will further add value to the academic and empirical fields. Moreover, the framework was developed based on the feedback from the public sector employees in Dubai which has a special cultural

significance and a different maturity level of excellence. Noting that Dubai's government excellence program started since 1997, it is highly recommended for other researchers to re-conduct the study in other Emirates and countries which will lead to other aspects and views for developing and improving the framework.

- Further studies are needed to ratify the proposed framework of this study. Such studies will help create a body of evidence which will help in popularizing the model and generating further evidence for its implementation. The specific areas of how the five phases of design thinking can be incorporated in the functioning of bureaucratic public sector organizations and the more general implementation of the entire model with its design-thinking inspired methodology are recommended as future research areas.
- This study has considered the context of public sector organizations in Dubai as a whole. There are, however, more variations within this sector which can affect the implementation of business excellence. Moreover, insights from within teams and organizations are needed to further enrich the practice of the proposed framework. These insights can help managers of organizations with limited expertise or with such top managers who do not realize the significance of business excellence and need more evidence and reassurance to make the shift towards the implementation of the model.
- Finally, business excellence has two sides which complement each other- the institutional excellence and the individual excellence. The design thinking-based framework provided by this study is for the implementation of business excellence at the institutional level. The recommendation for future researchers is to investigate the possibility of using design thinking in order to build a nominee journey approach, starting from recruiting the right

excellent people, through motivation, coaching and support until they win individual prizes at national and international levels.

6.16. Summary of the chapter

The key findings of the research were presented in this chapter starting with the presentation of the achievement of the research objectives including the design-thinking based framework which was the aim of this research and identified earlier as the seventh objective by the researcher. The researcher has presented a summary of the robustness of the research methodology along with the empirical and academic contributions of this study. An extensive comparison of the proposed design thinking-enabled framework for business excellence with the EFQM, MBNQA, and the UAE 4G Business Excellence model help to explore the strengths, as well as the limitations of the framework. Finally, the general recommendations for this research and the recommendations for future research are discussed.

7. List of references/bibliography

- Abbeh, O., Ngige, C. D. and Azuka, O. M. (2019) 'Total Quality Management and Organisational Performance: An Exploration of Issues', *Advanced Journal of Management, Accounting and Finance*, 4(6), pp. 48–68.
- Abubakar, A. M. *et al.* (2019) 'Knowledge management, decision-making style and organizational performance', *Journal of Innovation & Knowledge*, 4(2), pp. 104–114.
- Aburumman, A. A. (2020) 'COVID-19 impact and survival strategy in business tourism market: the example of the UAE MICE industry', *Humanities and Social Sciences Communications*, 7(1), pp. 1–11.
- Adamek, P. (2018) 'An investigation of interconnection between business excellence models and corporate sustainability approach', *European Journal of Sustainable Development*, 7(1), pp. 381–381.
- Afthonidis, E. and Tsiotras, G. (2014) 'Strategies for business excellence under an economic crisis', *The TQM Journal*, 26(6), pp. 610–624. doi: 10.1108/TQM-10-2012-0078.
- Aguirre-Urreta, M. I. and Hu, J. (2019) 'Detecting common method bias: Performance of the Harman's single-factor test', *ACM SIGMIS Database: the DATABASE for Advances in Information Systems*, 50(2), pp. 45–70.
- Ahmad, N. and Daghfous, A. (2010) 'Knowledge sharing through inter-organizational knowledge networks: Challenges and opportunities in the United Arab Emirates', *European Business Review*.
- Ahmad, S., Zulkurnain, N. N. A. and Khairushalimi, F. I. (2016) 'Assessing the validity and reliability of a measurement model in Structural Equation Modeling (SEM)', *Journal of Advances in Mathematics and Computer Science*, pp. 1–8.
- Ahrens, T. (2013) 'Assembling the Dubai Government Excellence Program: A motivational approach to improving public service governance in a monarchical context', *International Journal of Public Sector Management*, 26(7), pp. 576–592. doi: 10.1108/IJPSM-06-2012-0079.
- Aiken, L. S., West, S. G. and Reno, R. R. (1991) *Multiple regression: Testing and interpreting interactions*. Sage.
- Akinwale, Y. O., Ababtain, A. K. and Alaraifi, A. A. (2019) 'Structural equation model analysis of factors influencing entrepreneurial interest among university students in Saudi Arabia', *Journal of Entrepreneurship Education*, 22(4), pp. 1–14.
- Al Awadhi, A. Y. (2010) *Investigating of TQM implementing to the UAE public sector organisations*. Doctoral. Sheffield Hallam University. Available at: <http://shura.shu.ac.uk/19227/>.

Al Ghufli, A. A. (2012) *Implementation of Business Excellence Model: A Case Study of UAE Public Sector Organisation*. The University of Manchester (United Kingdom).

AL MANSOORI, H. M., ALSAUD, A. B. and YAS, H. (2021) 'The impact of Covid 19 on increasing the cost of labor and project price in the United Arab Emirates', *International Journal of Pharmaceutical Research*, 13(1).

Aladwan, S. A. and Forrester, P. (2016) 'The leadership criterion: challenges in pursuing excellence in the Jordanian public sector', *The TQM Journal*, 28(2), pp. 295–316.

Al-Ahbabi, S. *et al.* (2017) 'A knowledge management framework for enhancing public sector performance', *International Journal of Knowledge Management Studies*, 8(3–4), pp. 329–350.

Al-Esia, Z. and Skok, W. (2014) 'Arab knowledge sharing in a multicultural workforce: A dual case study in the UAE', *Arabian Journal of Business and Management Review*, 4(4), pp. 1–10.

Alhafiti, S. *et al.* (2019) 'The Effect of Strategic Planning and Organizational Culture on the Organizational Excellence within Public Organizations in the UAE: A Proposed Research Framework', *International Journal of Management and Human Science (IJMHS)*, 3(4), pp. 1–8.

Al-Khalifa, K. N. and Aspinwall, E. M. (2000) 'Using the competing values framework to identify the ideal culture profile for TQM: a UK perspective', *International journal of Manufacturing technology and management*, 2(1–7), pp. 1024–1040.

Al-Marri, K., Ahmed, A. M. M. B. and Zairi, M. (2007) 'Excellence in service: an empirical study of the UAE banking sector', *International Journal of Quality & Reliability Management*, 24(2), pp. 164–176.

Al-Qudah, S., Obeidat, A. M. and Shrouf, H. (2020) 'The impact of strategic human resources planning on the organizational performance of public shareholding companies in Jordan', *Problems and Perspectives in Management*, 18(1), p. 219.

Alraouf, A. (2016) *"Dohaization": An Emerging Interface between Knowledge, Creativity, and Gulf Urbanity*. Gulf Research Centre Cambridge Jeddah, Geneva, and Cambridge.

Al-Swidi, A., Faiz, G. and Gelaidan, H. (2019) 'Total quality management and the organisational performance: the mediating role of market orientation', *International Journal of Business Process Integration and Management*, 9(4), pp. 245–257.

Al-Telbani, N. A. and Radwan, M. (2013) 'The Relationship between the Factors Hindering Quality Improvement and the Implementation of Quality Improvement at the Palestinian Ministry Of Health-Gaza', *Jordan Journal of Business Administration*, 153(955), pp. 1–80.

Al-Zamany, Y., Hoddell, S. E. and Savage, B. M. (2002) 'Understanding the difficulties of implementing quality management in Yemen', *The TQM Magazine*, 14(4), pp. 240–247.

- Amponsah, C. T. and Ahmed, G. (2017) 'New global dimensions of business excellence', *International Journal of Business Excellence*, 13(1), p. 60. doi: 10.1504/IJBEX.2017.085794.
- Andersen, E. and Jessen, S. (2007) 'A Quick Project Maturity Assessment', in. *PMI Global Congress Proceedings, Hong Kong, CID*.
- Andretti, M. (2015) *Mario Andretti Quotes, BrainyQuote*. Available at: https://www.brainyquote.com/quotes/mario_andretti_130613 (Accessed: 10 November 2020).
- Androniceanu, A. (2017) 'The three-dimensional approach of Total Quality Management, an essential strategic option for business excellence', *Amfiteatru Economic*, 19(44), pp. 61–78.
- Antony, J. P. and Bhattacharyya, S. (2010) 'Measuring organizational performance and organizational excellence of SMEs–Part 2: an empirical study on SMEs in India', *Measuring business excellence*, 14(3), pp. 42–52.
- Armstrong, M. and Taylor, S. (2020) *Armstrong's handbook of human resource management practice*. Kogan Page Publishers.
- Arroyo, P. *et al.* (2018) 'A new method for applying choosing by advantages (CBA) multicriteria decision to a large number of design alternatives', *Energy and Buildings*, 167, pp. 30–37. doi: 10.1016/j.enbuild.2018.02.031.
- Atiyyah, H. S. (1996) 'Expatriate acculturation in Arab Gulf countries', *Journal of Management Development*.
- Baidoun, S. and Zairi, M. (2003) 'A proposed model of TQM implementation in the Palestinian context', *Total Quality Management & Business Excellence*, 14(10), pp. 1193–1211.
- Baker, F. W. and Moukhliiss, S. (2020) 'Concretising Design Thinking: A Content Analysis of Systematic and Extended Literature Reviews on Design Thinking and Human-Centred Design', *Review of Education*, 8(1), pp. 305–333. doi: 10.1002/rev3.3186.
- Barnett, A., Yandle, B. and Naufal, G. (2013) 'Regulation, trust, and cronyism in Middle Eastern societies: The simple economics of "wasta"', *The Journal of Socio-Economics*, 44, pp. 41–46.
- Baron, A. and Armstrong, M. (2007) *Human capital management: achieving added value through people*. Kogan Page Publishers.
- Bartel, A. P. and Harrison, A. E. (2005) 'Ownership versus environment: Disentangling the sources of public-sector inefficiency', *Review of Economics and Statistics*, 87(1), pp. 135–147.
- Bauer, J., Falshaw, R. and Oakland, J. S. (2005) 'Implementing business excellence', *Total Quality Management & Business Excellence*, 16(4), pp. 543–553.
- Beckman, S. L. and Barry, M. (2007) 'Innovation as a learning process: Embedding design thinking', *California management review*, 50(1), pp. 25–56.

Bell, E., Bryman, A. and Harley, B. (2018) *Business research methods*. 5th edn. Oxford: Oxford University Press.

Benitez, J. *et al.* (2020) 'How to perform and report an impactful analysis using partial least squares: Guidelines for confirmatory and explanatory IS research', *Information & Management*, 57(2), p. 103168. doi: 10.1016/j.im.2019.05.003.

Bennis, W. (2014) *Warren Bennis Quotes, BrainyQuote*. Available at: https://www.brainyquote.com/quotes/warren_bennis_121312 (Accessed: 10 November 2020).

Bertolotti, F., Di Norcia, M. and Vignoli, M. (2018) 'Service design principles for organizational well-being: Improving the employee experience through design thinking', in: *ServDes2018. Service Design Proof of Concept, Proceedings of the ServDes. 2018 Conference, 18-20 June, Milano, Italy*, Linköping University Electronic Press, pp. 736–750.

Bird, A. (2014) *Thomas kuhn*. Routledge.

Birdi, K., Leach, D. and Magadley, W. (2016) 'The relationship of individual capabilities and environmental support with different facets of designers' innovative behavior', *Journal of Product Innovation Management*, 33(1), pp. 19–35.

Biygautane, M. and Al-Yahya, K. (2011) 'Knowledge management in the UAE's public sector: the case of Dubai', in: *Dubai School of Government, paper presented at the Gulf Research Meeting Conference at the University of Cambridge, UK*.

Black, B. *et al.* (2017) 'Corporate governance indices and construct validity', *Corporate Governance: An International Review*, 25(6), pp. 397–410.

Bloomberg (2020) *Dubai businesses return to growth but not so good news on jobs front, mint*. Available at: <https://www.livemint.com/industry/human-resource/dubai-businesses-return-to-growth-but-not-so-good-news-on-jobs-front-11597123064462.html> (Accessed: 1 December 2020).

Bobrek, M., Majstorovic, V. and Sokovic, M. (2006) 'Design approach in management toward to business excellence', *Journal of Achievements in Materials and Manufacturing Engineering*, 16(1–2).

Boland, R. J. and Collopy, F. (2004) *Design matters for management*. na.

Bolboli, S. A. and Reiche, M. (2013) 'A model for sustainable business excellence: implementation and the roadmap', *The TQM Journal*, 25(4), pp. 331–346.

Bolboli, S. A. and Reiche, M. (2014) 'Culture-based design and implementation of business excellence', *The TQM Journal*, 26(4), pp. 329–347.

Bolisani, E. and Bratianu, C. (2018) 'The emergence of knowledge management', in *Emergent knowledge strategies*. Springer, pp. 23–47.

Bou-Llusar, J. C. *et al.* (2009) 'An empirical assessment of the EFQM Excellence Model: Evaluation as a TQM framework relative to the MBNQA Model', *Journal of operations management*, 27(1), pp. 1–22.

Bouranta, N. (2020) 'Does transformational leadership influence TQM practices? A comparison analysis between manufacturing and service firms', *The TQM Journal*. doi: <https://doi.org/10.1108/TQM-12-2019-0296>.

Boy, G. A. (2017) *The handbook of human-machine interaction: a human-centered design approach*. CRC Press.

BPIR (2019) *Benchmarking for best practice - BPIR.com*. Available at: https://www.bpir.com/component/option,com_snippets/id,124/type,measure/ (Accessed: 11 November 2020).

Breaz, A. M. (2019) 'Attitudes Towards Globalization and its Implications to Different Categories of Age', *Revista de Asistență Socială*, 18(3), pp. 67–78.

Brown, A. (2013) 'Managing challenges in sustaining business excellence', *International Journal of Quality & Reliability Management*, 30(4), pp. 461–475.

Brown, T. and Wyatt, J. (2010) 'Design thinking for social innovation', *Development Outreach*, 12(1), pp. 29–43.

Brusca, I. *et al.* (2016) *Public sector accounting and auditing in Europe: The challenge of harmonization*. Springer.

Buchanan, R. (1992) 'Wicked problems in design thinking', *Design issues*, 8(2), pp. 5–21.

Bücker, J. J. and Korzilius, H. (2015) 'Developing cultural intelligence: assessing the effect of the Ecotonos cultural simulation game for international business students', *The International Journal of Human Resource Management*, 26(15), pp. 1995–2014.

Budi, I. W. and Mulyana, B. (2017) 'The effect of internal and external factors of companies on profitability and its implications on stock price index of state-owned banks', *Economics*, 5(2), pp. 58–71.

Cain, M. K., Zhang, Z. and Yuan, K.-H. (2017) 'Univariate and multivariate skewness and kurtosis for measuring nonnormality: Prevalence, influence and estimation', *Behavior research methods*, 49(5), pp. 1716–1735.

Calatrava Moreno, M. del C. (2013) 'Towards a flexible assessment of higher education with 360-degree feedback', in *2013 12th International Conference on Information Technology Based Higher Education and Training (ITHET). 2013 12th International Conference on Information Technology-Based Higher Education and Training (ITHET)*, Antalya: IEEE, pp. 1–7. doi: 10.1109/ITHET.2013.6671041.

- Callaway, S. K. (2017) 'How the principles of the sharing economy can improve organizational performance of the US public school system', *International Journal of Public Policy and Administration Research*, 4(1), pp. 1–11.
- Carlgren, L., Rauth, I. and Elmquist, M. (2016a) 'Framing design thinking: The concept in idea and enactment', *Creativity and Innovation Management*, 25(1), pp. 38–57.
- Carlgren, L., Rauth, I. and Elmquist, M. (2016b) 'Framing Design Thinking: The Concept in Idea and Enactment: Creativity and Innovation Management', *Creativity and Innovation Management*, 25(1), pp. 38–57. doi: 10.1111/caim.12153.
- Carvalho, A. M. *et al.* (2019) 'Operational excellence, organisational culture and agility: the missing link?', *Total Quality Management & Business Excellence*, 30(13–14), pp. 1495–1514.
- Centobelli, P., Cerchione, R. and Esposito, E. (2019) 'Measuring the use of knowledge management systems in supply firms', *Measuring Business Excellence*, 26(4), pp. 426–441.
- Chandler, J. D. (2020) *Innovation, Social Networks, and Service Ecosystems: Managing Value in the Digital Economy*. Springer.
- Chen, F. *et al.* (2016) *Robust multimodal cognitive load measurement*. Springer.
- Chin, W. W. (1998) *The PLS approach for structural equation modelling*. New York: Lawrence Erlbaum Associates.
- Chin, W. W. (2010) 'How to write up and report PLS analyses', in *Handbook of partial least squares*. Springer, pp. 655–690.
- Chou, D. C. (2018) 'Applying design thinking method to social entrepreneurship project', *Computer Standards & Interfaces*, 55, pp. 73–79.
- Clark, K. and Smith, R. (2008) 'Unleashing the power of design thinking', *Design Management Review*, 19(3), pp. 8–15.
- Cohendet, P., Parmentier, G. and Simon, L. (2017) 'Managing knowledge, creativity and innovation', in *The Elgar companion to innovation and knowledge creation*. Edward Elgar Publishing.
- Colvin, A. J. and Boswell, W. R. (2007) 'The problem of action and interest alignment: Beyond job requirements and incentive compensation', *Human Resource Management Review*, 17(1), pp. 38–51.
- Conti, T. (2001) 'Why most companies do not get the most out of their self-assessments', in *ASQ World Conference on Quality and Improvement Proceedings*, American Society for Quality, p. 229.
- Costin, H. I. (1994) *Readings in total quality management*. Dryden Press.

Creswell, J. W. and Creswell, J. D. (2017) *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage publications.

Cross, N. (1982) 'Designerly ways of knowing', *Design studies*, 3(4), pp. 221–227.

Cross, N. (2018) 'A brief history of the design thinking research symposium series', *Design Studies*, 57, pp. 160–164.

Cunningham, J. B. and Kempling, J. S. (2009) 'Implementing change in public sector organizations', *Management Decision*, 47(2), pp. 330–344.

Dahlgaard-Park, S. M. (2011) 'The quality movement: where are you going?', *Total Quality Management & Business Excellence*, 22(5), pp. 493–516.

Dahlgaard-Park, S. M. *et al.* (2013) 'Diagnosing and prognosticating the quality movement—a review on the 25 years quality literature (1987–2011)', *Total quality management & business excellence*, 24(1–2), pp. 1–18.

Das, K. R. and Imon, A. (2016) 'A brief review of tests for normality', *American Journal of Theoretical and Applied Statistics*, 5(1), pp. 5–12.

Davies, J. (2008) 'Integration: is it the key to effective implementation of the EFQM Excellence Model?', *International Journal of Quality & Reliability Management*, 25(4), pp. 383–399.

Davis, M. W. and Dolson, M. (2018) 'Managing organizational culture and design during succession', *Journal of Practical Consulting*, 6(1), pp. 45–54.

Dawabsheh, M., Hussein, A. and Jermisittiparsert, K. (2019) 'The triangular relationship between TQM, organizational excellence and organizational performance: A case of Arab American University Palestine', *Management Science Letters*, 9(6), pp. 921–932.

Design Council (2011) *Design for Innovation*. Available at: https://www.designcouncil.org.uk/sites/default/files/asset/document/DesignForInnovation_Dec2011.pdf.

Dilawo, R. S. and Salimi, Z. (2019) 'Understanding TQM implementation barriers involving construction companies in a difficult environment', *International Journal of Quality & Reliability Management*, 36(7), pp. 1137–1158.

Dinu, V. (2017) 'Quality management and business excellence', *Amfiteatru Economic Journal*, 19(44), pp. 5–7.

Dolicanin, C. *et al.* (2015) *Handbook of research on democratic strategies and citizen-centered e-government services*. Information Science Reference.

Dorst, K. (2011) 'The core of 'design thinking' and its application', *Design studies*, 32(6), pp. 521–532.

- Douglas, A. and Vora, M. K. (2013) 'Business excellence through sustainable change management', *The TQM Journal*, 25(6), pp. 625–640.
- Doulatabadi, M. and Yusof, A. (2018) 'Self-Assessment and Quality Awards Models: A review of practice and process', in: *Proceedings of the International Conference on Industrial Engineering and Operations Management, Bandung, Indonesia*, pp. 6–8.
- Dubai Government Excellence Program (2019) *DGEP*. Available at: <https://dgep.gov.ae/index.html> (Accessed: 12 November 2020).
- Dubai Statistics Center (2013) *Employees in local government departments by nationality and sex–Emirate of Dubai*. Available at: https://www.dsc.gov.ae/Report/DSC_SYB_2010_03_05.pdf.
- Dunne, D. (2018) 'Explainer: Six ideas to limit global warming with solar geoengineering | Carbon Brief', *Carbon Brief*, 5 September. Available at: <https://www.carbonbrief.org/explainer-six-ideas-to-limit-global-warming-with-solar-geoengineering> (Accessed: 15 November 2020).
- Dunne, D. and Martin, R. (2006) 'Design thinking and how it will change management education: An interview and discussion', *Academy of Management Learning & Education*, 5(4), pp. 512–523.
- Dutta, S. and Mandal, B. K. (2020) 'Impact of Lean Manufacturing in Business Excellence', *American Journal of Business and Management Research*, 1(1), pp. 1–10. doi: 10.15864/ajbmr.1102.
- Easterday, M. W., Lewis, D. R. and Gerber, E. M. (2014) 'Design-based research process: Problems, phases, and applications', in: Boulder, CO: International Society of the Learning Sciences.
- Edmondson, D. L., Kern, F. and Rogge, K. S. (2019) 'The co-evolution of policy mixes and socio-technical systems: Towards a conceptual framework of policy mix feedback in sustainability transitions', *Research Policy*, 48(10), p. 103555.
- EFQM (2020) 'The Concepts', *EFQM*. Available at: <https://www.efqm.org/index.php/efqm-model/the-concepts/> (Accessed: 12 November 2020).
- Elsbach, K. D. and Stigliani, I. (2018) 'Design thinking and organizational culture: A review and framework for future research', *Journal of Management*, 44(6), pp. 2274–2306.
- Emmitt, S. and Ruikar, K. (2013) *Collaborative design management*. Routledge.
- Escrig, A. B. and de Menezes, L. M. (2015) 'What characterizes leading companies within business excellence models? An analysis of "EFQM Recognized for Excellence" recipients in Spain', *International Journal of Production Economics*, 169, pp. 362–375.

- Escrig-Tena, A. B., Garcia-Juan, B. and Segarra-Ciprés, M. (2019) 'Drivers and internalisation of the EFQM excellence model', *International Journal of Quality & Reliability Management*, 36(3), pp. 398–419.
- Etikan, I. and Bala, K. (2017) 'Sampling and sampling methods', *Biometrics & Biostatistics International Journal*, 5(6), p. 00149.
- Ferdowsian, M. C. (2016) 'Total business excellence—a new management model for operationalizing excellence', *International Journal of Quality & Reliability Management*, 33(7), pp. 942–984.
- Fernández, E., Valle, S. and Pérez-Bustamante, G. (2020) 'Business excellence practice: efficiency wages versus individual economic incentives', *Total Quality Management & Business Excellence*, pp. 1–6.
- Gartner (2020) *Top 5 priorities for HR Leaders in 2021*.
- Geisser, S. (1975) 'The predictive sample reuse method with applications', *Journal of the American statistical Association*, 70(350), pp. 320–328.
- George, C., Cooper, F. and Douglas, A. (2003) 'Implementing the EFQM excellence model in a local authority', *Managerial auditing journal*, 18(2), pp. 212–217.
- Ghobakhloo, M. and Azar, A. (2018) 'Business excellence via advanced manufacturing technology and lean-agile manufacturing', *Journal of Manufacturing Technology Management*, 29(1), pp. 2–24.
- Glen, R. *et al.* (2015) 'Teaching design thinking in business schools', *The International Journal of Management Education*, 13(2), pp. 182–192.
- Gloet, M. and Samson, D. (2017) 'Linking Knowledge Management, Business Excellence and Innovation Performance', in: *Proceedings of the 50th Hawaii International Conference on System Sciences*.
- Godinho, V. (2020) 'UAE issues decree to regulate private sector job cuts, salary reductions during Covid-19', *Gulf Business*, 30 March. Available at: <https://gulfbusiness.com/uae-issues-decree-to-regulate-private-sector-job-cuts-salary-reductions-during-covid-19/> (Accessed: 1 December 2020).
- Goetsch, D. L. and Davis, S. B. (2014) *Quality management for organizational excellence*. pearson Upper Saddle River, NJ.
- Gong, Y., Zhou, J. and Chang, S. (2013) 'Core knowledge employee creativity and firm performance: The moderating role of riskiness orientation, firm size, and realized absorptive capacity', *Personnel Psychology*, 66(2), pp. 443–482.

- Gonzi, R. D. (2019) 'Public sector responses to radical change: an analysis of theoretical models', in *Change and Continuity Management in the Public Sector: The DALI Model for Effective Decision-Making*. Emerald Publishing Limited.
- Gorenak, Š. (2015) 'European foundation for quality management excellence model can encourage ISO 26000 implementation', in *Perspectives on Business and Management*. Rijeka, Croatia: InTech, pp. 23–43.
- Gorgol, I. and Ruciński, A. (2008) 'Planar Ramsey numbers for cycles', *Discrete mathematics*, 308(19), pp. 4389–4395.
- Government of Dubai (2017) *Government Entities*. Available at: <http://xn--ngbn6f.xn--mgbaam7a8h/en/government/Pages/default.aspx?category=Government> (Accessed: 31 December 2017).
- Gray, D. E. (2019) *Doing research in the business world*. SAGE Publications Limited.
- Green, L. W. (2008) 'Making research relevant: if it is an evidence-based practice, where's the practice-based evidence?', *Family practice*, 25(suppl_1), pp. i20–i24.
- Grunig, J. E. and Grunig, L. A. (2008) 'Excellence Theory in Public Relations: Past, Present, and Future', in Zerfass, A., van Ruler, B., and Sriramesh, K. (eds) *Public Relations Research*. Wiesbaden: VS Verlag für Sozialwissenschaften, pp. 327–347. doi: 10.1007/978-3-531-90918-9_22.
- Gryna, F. M. and Juran, J. M. (1998) *Juran's quality control handbook*. McGraw-Hill.
- Haak-Saheem, W. and Darwish, T. K. (2014) 'The role of knowledge management in creating a culture of learning: The case of Dubai Municipality', *Management Decision*, 52(9), pp. 1611–1629.
- Hacker, W., Sachse, P. and Schroda, F. (1998) 'Design thinking-Possible ways to successful solutions in product development', in *Designers*. Springer, pp. 205–216.
- Hafeez, K., Malak, N. and Abdelmeguid, H. (2006) 'A framework for TQM to achieve business excellence', *Total Quality Management and Business Excellence*, 17(9), pp. 1213–1229.
- Haffer, J. and Haffer, R. (2015) 'Positive Employee Attitudes As a Determinant of Project Success and Business Excellence: The Case of Poland', *Journal of Positive Management*, 6(4), pp. 15–28.
- Hair, J. F. *et al.* (2012) 'An assessment of the use of partial least squares structural equation modeling in marketing research', *Journal of the academy of marketing science*, 40(3), pp. 414–433.
- Hair, J. F., Black, W. C. and Barry, J. B. (2010) *Multivariate data analysis: A global perspective*. Pearson Education.

Hair, J. F., Sarstedt, M. and Ringle, C. M. (2019) 'Rethinking some of the rethinking of partial least squares', *European Journal of Marketing*, 53(4), pp. 566–584. doi: 10.1108/EJM-10-2018-0665.

Hair, J. F., Tatham, A. R. and Black, W. C. (1998) *Multivariate data analysis*. New Jersey: Prentice Hall.

Hammad, O., Dweiri, F. and Ojiako, U. (2020) 'Impact of implementing the fourth generation of excellence system on Dubai government entities' performance', *International Journal of System Assurance Engineering and Management*, pp. 1–23.

Hasan, M. and Hannifah, H. (2013) 'A study of Australian business excellence award winners', 6(1), pp. 1–7.

Hashim, M. J., Osman, I. and Alhabshi, S. M. (2015) 'Effect of intellectual capital on organizational performance', *Procedia-Social and Behavioral Sciences*, 211, pp. 207–214.

Hayes, A. F. (2017) *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. Guilford publications.

Henseler, J., Ringle, C. M. and Sarstedt, M. (2015) 'A new criterion for assessing discriminant validity in variance-based structural equation modeling', *Journal of the academy of marketing science*, 43(1), pp. 115–135.

Henseler, J., Ringle, C. M. and Sinkovics, R. R. (2009) 'The use of partial least squares path modeling in international marketing', in *New challenges to international marketing*. Emerald Group Publishing Limited.

Hobcraft, P. (2018) *An Introduction to Design Thinking*. Available at: <https://blog.hypeinnovation.com/an-introduction-to-design-thinking-for-innovation-managers> (Accessed: 10 November 2020).

Hofstede, G. (2011) 'Dimensionalizing cultures: The Hofstede model in context', *Online readings in psychology and culture*, 2(1), pp. 2307–0919.

Homburg, C., Schwemmler, M. and Kuehnl, C. (2015) 'New Product Design: Concept, Measurement, and Consequences', *Journal of Marketing*, 79(3), pp. 41–56. doi: 10.1509/jm.14.0199.

Hussain, T., Edgeman, R. and Eskildsen, J. K. (2020) 'Knowledge-based intellectual structure of research in business excellence (1995–2015)', *Total Quality Management & Business Excellence*, 31(11–12), pp. 1171–1194.

Hutchings, K. and Weir, D. (2006) 'Guanxi and wasta: A comparison', *Thunderbird International Business Review*, 48(1), pp. 141–156.

Hutchins, E. (1995) *Cognition in the Wild*. MIT press.

Igbalajobi, T. (2015) 'Human capital as an asset and financial reporting', *International Journal of Economics, Commerce and Management*, 3(1), pp. 1–10.

Jabnoun, N. (2019) 'A proposed model for sustainable business excellence', *Management Decision*, 58(2), pp. 221–238.

Jaeger, A. (2018) 'Achieving business excellence through self-assessment for personal and professional excellence', *Total Quality Management & Business Excellence*, 29(13–14), pp. 1612–1632.

Jarde, S. (2019) *Driving Business Excellence in Local Food Business Through Strategy Innovation*. Master's. Lahti University of Applied Sciences. Available at: https://www.theseus.fi/bitstream/handle/10024/166850/Jarde_Shrusti.pdf?sequence=2&isAllowed=y.

Johansson-Sköldberg, U., Woodilla, J. and Çetinkaya, M. (2013) 'Design thinking: past, present and possible futures', *Creativity and innovation management*, 22(2), pp. 121–146.

Jones, S. (2008) 'Training and cultural context in the Arab Emirates: fighting a losing battle?', *Employee Relations*.

Kamaruddin, K. and Abeysekera, I. (2013) *Intellectual capital and public sector performance*. Emerald Group Publishing.

Kanji, G. K. (2002) 'Business excellence: make it happen', *Total Quality Management*, 13(8), pp. 1115–1124.

Kanji, G. K. (2008) 'Architecture of business excellence in the public and service sectors', *Total Quality Management*, 19(4), pp. 399–415.

Kapitzke, C. (2003) 'Information literacy: A review and poststructural critique', *Australian Journal of Language and Literacy*, 26(1), pp. 53–66.

Kassem, R. *et al.* (2019) 'Assessing the impact of organizational culture on achieving business excellence with a moderating role of ICT', *Benchmarking: An International Journal*, 26(1), pp. 117–146.

Kerzner, H. (2017) *Project management: a systems approach to planning, scheduling, and controlling*. John Wiley & Sons.

Khan, S. N. and Ali, E. I. E. (2017) 'The moderating role of intellectual capital between enterprise risk management and firm performance: A conceptual review', *American Journal of Social Sciences and Humanities*, 2(1), pp. 9–15.

Kimbell, L. (2011) 'Rethinking design thinking: Part I', *Design and Culture*, 3(3), pp. 285–306.

Klein, A., Waxin, M. F. and Radnell, E. (2009) 'The impact of the Arab national culture on the perception of ideal organizational culture in the United Arab Emirates: An empirical study of 17 firms', *Education, Business and Society: Contemporary Middle Eastern Issues*.

Kline, R. B. (2005) *Methodology in the social sciences Principles and practice of structural equation modelin*. New York.

Kline, R. B. (2015) *Principles and practice of structural equation modeling*. Guilford publications.

Krajcsák, Z. (2019) 'Leadership strategies for enhancing employee commitment in TQM', *Journal of Management Development*, 38(6), pp. 455–463.

Krippendorff, K. (2006) 'The semantic turn: A new foundation for design', *ARTIFACT-ROUTLEDGE-*, 1(11), p. 51.

Krystynski, D., Coff, R. and Campbell, B. (2020) 'Charting a path between firm-specific incentives and human capital-based competitive advantage', *Strategic Management Journal*, 42(2), pp. 386–412.

Kuehn, K. W. and Al-Busaidi, Y. (2000) 'A difference of perspective: An exploratory study of Omani and expatriate values and attitudes', *International Journal of Commerce and Management*.

Kupp, M., Anderson, J. and Reckhenrich, J. (2017) 'Why design thinking in business needs a rethink', *MIT sloan management review*, 59(1), p. 42.

Langrish, J. Z. (2016) 'The Design Methods Movement From Optimism to Darwinism', in. *Design Research Society Conference 2016*. doi: 10.21606/drs.2016.222.

Lasrado, F. (2018) *Achieving Organizational Excellence A Quality Management Program for Culturally Diverse Organizations*. Springer.

Lasrado, F. and Gomiscek, B. (2017) 'The Business Excellence Journey in UAE Organizations', in *Innovation Arabia 10: Quality and Business Management Conference Proceedings*. Dubai: Hamdan Bin Mohammed Smart University, pp. 189–203.

Lasrado, F. and Uzbek, C. (2017) 'The excellence quest: a study of business excellence award-winning organizations in UAE', *Benchmarking: An International Journal*, 24(3), pp. 716–734.

Lau, R. S. M. and Anderson, C. (1998) 'A three-dimensional perspective of total quality management', *International Journal of Quality & Reliability Management*, 15(1), pp. 85–98.

Laurent, A. (1983) 'The cultural diversity of western conceptions of management', *International Studies of Management & Organization*, 13(1–2), pp. 75–96.

Lawson, B. (2006) *How designers think: The design process demystified*. Routledge.

- Leih, S., Linden, G. and Teece, D. J. (2015) *Business model innovation and organizational design*.
- Lepeley, M.-T. (2020) *Human Centered Management: 5 Pillars of Organizational Quality and Global Sustainability*. Routledge.
- Leskaj, E. (2017) 'The challenges faced by the strategic management of public organizations', *Revista» Administratie si Management Public «(RAMP)*, (29), pp. 151–161.
- Liedtka, J. (2015) 'Perspective: Linking design thinking with innovation outcomes through cognitive bias reduction', *Journal of product innovation management*, 32(6), pp. 925–938.
- Lin, C.-H. (2018) 'The determinants of achieving family business excellence: conservative quality perspective?', *Total Quality Management & Business Excellence*, 29(13–14), pp. 1503–1520.
- Ling, L. X. and Yuen, J. L. F. (2014) 'Organizational commitment of white collar employees in damansara heights, Kuala Lumpur', *Journal of Social Economics Research*, 1(7), pp. 156–168.
- Lowry, P. B. and Gaskin, J. (2014) 'Partial least squares (PLS) structural equation modeling (SEM) for building and testing behavioral causal theory: When to choose it and how to use it', *IEEE transactions on professional communication*, 57(2), pp. 123–146.
- Madu, C. N. (2012) *Handbook of total quality management*. Springer Science & Business Media.
- Mahmoud-Jouini, S. B., Midler, C. and Silberzahn, P. (2016) 'Contributions of Design Thinking to Project Management in an Innovation Context', *Project Management Journal*, 47(2), pp. 144–156. doi: 10.1002/pmj.21577.
- Maier, M. and Rechtin, E. (2009) *The Art of Systems Architecting*. CRC Press.
- Maitra, B. (2016) 'Investment in Human Capital and Economic Growth in Singapore', *Global Business Review*, 17(2), pp. 425–437. doi: 10.1177/0972150915619819.
- Malek Mirzaee, Y. *et al.* (2019) 'Conceptualization of business excellence model with a grand theory approach', *International Journal of Human Capital in Urban Management*, 4(3), pp. 169–180.
- Mann, R. *et al.* (2020) 'An analysis of a benchmarking initiative to help government entities to learn from best practices-the'Dubai We Learn'initiative', *International Journal of Excellence in Government*, 2(1), pp. 2–23.
- Mann, R., Adebajo, D. and Tickle, M. (2011) 'Deployment of business excellence in Asia: an exploratory study', *International Journal of Quality & Reliability Management*, 28(6), pp. 604–627. doi: 10.1108/02656711111141184.

Mann, R., Mohammad, M. and Agustin, M. (2010) *Understanding Business Excellence*. Asian Productivity Organization.

Mann, R., Mohammad, M. and Agustin, T. A. (2014) *Understanding Business Excellence: An awareness guidebook An awareness guidebook for SMEs*. Asian Productivity Organization. Available at: <https://www.apo-tokyo.org/wp-content/uploads/sites/3/2014/07/Understanding-Business-Excellence.pdf>.

Mansour, A. M. (2017) 'Has the United Arab Emirates federal government succeeded to transform its federal bureaucracy into a new public management system?', *International Public Management Review*, 18(1), pp. 116–134.

Manzini, E. (2015) *Design, when everybody designs: An introduction to design for social innovation*. MIT press.

Mardani, A. *et al.* (2018) 'The relationship between knowledge management and innovation performance', *The Journal of High Technology Management Research*, 29(1), pp. 12–26.

Marks and Spencer (2021) *Cotton, Cotton*. Available at: <http://corporate.marksandspencer.com/sustainability/clothing-and-home/product-standards/raw-materials-commodities/cotton> (Accessed: 2 February 2021).

Marsh, H. W. *et al.* (2020) 'Confirmatory factor analysis (CFA), exploratory structural equation modeling (ESEM), and set-ESEM: optimal balance between goodness of fit and parsimony', *Multivariate behavioral research*, 55(1), pp. 102–119.

Marsh, H. W., Hau, K.-T. and Grayson, D. (2005) 'Goodness of Fit in Structural Equation Models.', in *Multivariate applications book series. Contemporary psychometrics: A festschrift for Roderick P. McDonald*. Lawrence Erlbaum Associates Publishers., pp. 275–340.

Martin, R. and Martin, R. L. (2009) *The design of business: Why design thinking is the next competitive advantage*. Harvard Business Press.

Martínez-Lorente, A. R., Dewhurst, F. and Dale, B. G. (1998) 'Total quality management: origins and evolution of the term', *The TQM magazine*, 10(5), pp. 378–386.

Marwa, S. and Zairi, M. (2008) 'Towards an integrated national quality award in Kenya', *The TQM journal*, 20(3), pp. 249–264.

Mathias, M., Fargher, S. and Beynon, M. (2019) 'Exploring the link between integrated leadership-in-government and follower happiness: the case of Dubai', *International Review of Administrative Sciences*, 85(4), pp. 780–798.

McAdam, R. *et al.* (2013) 'An exploratory study of business excellence implementation in the United Arab Emirates (UAE) public sector', *International Journal of Quality & Reliability Management*, 30(4), pp. 426–445.

- McDonagh, D. and Thomas, J. (2010) 'Rethinking design thinking: Empathy supporting innovation', *Australasian Medical Journal*, 3(8), pp. 458–464.
- McDonald, I., Zairi, M. and Idris, M. A. (2002) 'Sustaining and transferring excellence', *Measuring Business Excellence*, 6(3), pp. 20–30.
- Mele, C. and Colurcio, M. (2006) 'The evolving path of TQM: towards business excellence and stakeholder value', *International Journal of Quality & Reliability Management*, 23(5), pp. 464–489.
- Micheli, P. *et al.* (2019) 'Doing design thinking: Conceptual review, synthesis, and research agenda', *Journal of Product Innovation Management*, 36(2), pp. 124–148.
- Mohajan, H. K. (2017) 'Two criteria for good measurements in research: Validity and reliability', *Annals of Spiru Haret University. Economic Series*, 17(4), pp. 59–82.
- Mosely, G., Wright, N. and Wrigley, C. (2018) 'Facilitating design thinking: A comparison of design expertise', *Thinking Skills and Creativity*, 27, pp. 177–189.
- Motwani, J. and Kumar, A. (1997) 'The need for implementing total quality management in education', *International Journal of Educational Management*, 11(3), pp. 131–135.
- Msallam, A. A., Al Shobaki, M. J. and Abu-Naser, S. S. (2020) *The Reality of Achieving the Requirements of Total Quality Management in University Colleges*.
- Muratovski, G. (2015) *Research for designers: A guide to methods and practice*. Sage.
- Muthuveloo, R., Shanmugam, N. and Teoh, A. P. (2017) 'The impact of tacit knowledge management on organizational performance: Evidence from Malaysia', *Asia Pacific Management Review*, 22(4), pp. 192–201.
- Naude, D. (2018) *Design Thinking or Design Theatre?*, *Medium*. Available at: <https://dawidnaude.com/design-thinking-or-design-theatre-743ff5be3e0> (Accessed: 10 November 2020).
- Nenadál, J. (2020) 'The New EFQM Model: What is Really New and Could Be Considered as a Suitable Tool with Respect to Quality 4.0 Concept?', *Quality Innovation Prosperity*, 24(1), pp. 17–28.
- Ngah, R., Tai, T. and Bontis, N. (2016) 'Knowledge management capabilities and organizational performance in roads and transport authority of Dubai: The mediating role of learning organization', *Knowledge and Process Management*, 23(3), pp. 184–193.
- Nizamidou, C. and Vouzas, F. (2020) 'HR professionals cultivating resilience and crisis awareness toward a business excellence environment', *EuroMed Journal of Business*.
- Norman, D. A. (1988) *The psychology of everyday things*. Basic books.

- Nunnally, J. C. and Bernstein, I. H. (1994) *Psychometric theory*. 3rd edn. New York: McGraw Hill.
- Oakland, J. (2011) 'Leadership and policy deployment: the backbone of TQM', *Total Quality Management & Business Excellence*, 22(5), pp. 517–534.
- Obeidat, B. Y., Al-Suradi, M. M. and Tarhini, A. (2016) 'The impact of knowledge management on innovation', *Management Research Review*, 39(10), pp. 1214–1238.
- Oviatt, S. (2003) 'Multimodal interfaces', *The human-computer interaction handbook: Fundamentals, evolving technologies and emerging applications*, 14, pp. 286–304.
- Oviatt, S. (2006) 'Human-centered design meets cognitive load theory: designing interfaces that help people think', in: *Proceedings of the 14th ACM international conference on Multimedia*, pp. 871–880.
- Oviatt, S. (2017) 'Theoretical foundations of multimodal interfaces and systems', in *The Handbook of Multimodal-Multisensor Interfaces: Foundations, User Modeling, and Common Modality Combinations-Volume 1*, pp. 19–50.
- Owen, C. (2007) 'Design thinking: Notes on its nature and use', *Design Research Quarterly*, 2(1), pp. 16–27.
- Owen, C. L. (2006) *Design thinking: Driving innovation*. The Business Process Management Institute, pp. 1–5. Available at: https://www.id.iit.edu/wp-content/uploads/2015/03/Design-thinking-driving-innovation-owen_desthink06.pdf.
- Oxford Advanced Learner's Dictionary (2020) *excellence noun - Definition, pictures, pronunciation and usage notes*. Available at: <https://www.oxfordlearnersdictionaries.com/definition/english/excellence> (Accessed: 10 November 2020).
- Oxman, R. (2017) 'Thinking difference: Theories and models of parametric design thinking', *Design studies*, 52, pp. 4–39.
- Parker, L. D. (2020) 'The COVID-19 office in transition: cost, efficiency and the social responsibility business case', *Accounting, Auditing & Accountability Journal*, 33(8), pp. 1943–1967.
- Parnell, G. S., Driscoll, P. J. and Henderson, D. L. (2011) *Decision making in systems engineering and management*. John Wiley & Sons.
- Patel, S. and Mehta, K. (2017) 'Systems, Design, and Entrepreneurial Thinking: Comparative Frameworks', *Systemic Practice and Action Research*, 30(5), pp. 515–533. doi: 10.1007/s11213-016-9404-5.

- Peters, T. J. and Waterman, R. H. (1982) *In search of excellence: Lessons from America's best-run companies*. New York: Harper Business New York, NY.
- Peterson, R. A. and Kim, Y. (2013) 'On the relationship between coefficient alpha and composite reliability.', *Journal of applied psychology*, 98(1), p. 194.
- Pfeffer, J. (1994) *Competitive advantage through people: Unleashing the power of the work force*.
- Pogosyan, V. (2018) 'Philosophies of social behavior research: meta-analytic review', *Wisdom*, 11(2), pp. 85–92.
- Porter, W. W. *et al.* (2016) 'A qualitative analysis of institutional drivers and barriers to blended learning adoption in higher education', *The Internet and Higher Education*, 28, pp. 17–27. doi: 10.1016/j.iheduc.2015.08.003.
- Prajogo, D. I. and McDermott, C. M. (2005) 'The relationship between total quality management practices and organizational culture', *International Journal of Operations & Production Management*, 25(11), pp. 1101–1112.
- Qaisar, N. and Khan, H. G. A. (2010) 'E-Government challenges in public sector: A case study of Pakistan', *International Journal of Computer Science Issues (IJCSI)*, 7(5), p. 310.
- Rao, M. (2020) *Why knowledge sharing is even more important in the COVID-19 era: insights from CII's Global Knowledge Virtual Summit*, YourStory.com. Available at: <https://yourstory.com/2020/06/cii-knowledge-sharing-coronavirus-covid19> (Accessed: 3 December 2020).
- Rehman, M. S. U., Shafiq, M. T. and Afzal, M. (2021) 'Impact of COVID-19 on project performance in the UAE construction industry', *Journal of Engineering, Design and Technology*.
- Rittel, H. W. and Webber, M. M. (1973) 'Dilemmas in a general theory of planning', *Policy sciences*, 4(2), pp. 155–169.
- Riva, G., Vatalaro, F. and Davide, F. (2005) *Ambient intelligence: the evolution of technology, communication and cognition towards the future of human-computer interaction*. IOS press.
- Roberts, B. (2014) *A study into the importance of people in the workplace: the role people play in achieving business excellence*. University of Warwick.
- Roberts, J. P. *et al.* (2016) 'A design thinking framework for healthcare management and innovation', *Healthcare*, 4(1), pp. 11–14. doi: 10.1016/j.hjdsi.2015.12.002.
- Robinson, M. (2015) 'From old public administration to the new public service', *Implications for Public Sector Reform in Developing Countries*. Global Centre for Public Service Excellence, pp. 1–18.

- Rowe, P. G. (1987) *Design thinking*. MIT press.
- Sangperm, N. and Chienwattanasook, K. (2019) 'Roles of Transformational Leadership That Encourage Employees to Have the Innovation Work Behavior', *Asian Administration & Management Review*, 2(1).
- Santos, G. *et al.* (2018) 'Critical success factors in the management of ideas as an essential component of innovation and business excellence', *International Journal of Quality and Service Sciences*, 10(3), pp. 214–232.
- Saunders, M. N. *et al.* (2015) *Understanding research philosophy and approaches to theory development*. Harlow: Pearson Education.
- Savolainen, T. (2000) 'Leadership strategies for gaining business excellence through total quality management: a Finnish case study', *Total Quality Management*, 11(2), pp. 211–226.
- Schön, D. A. (1992) 'The theory of inquiry: Dewey's legacy to education', *Curriculum inquiry*, 22(2), pp. 119–139.
- Schrepp, M. (2020) 'On the Usage of Cronbach's Alpha to Measure Reliability of UX Scales.', *Journal of Usability Studies*, 15(4), pp. 247–258.
- Schwartz, S. H. (2012) 'An overview of the Schwartz theory of basic values', *Online readings in Psychology and Culture*, 2(1), pp. 2307–0919.
- Seba, I., Rowley, J. and Lambert, S. (2012) 'Factors affecting attitudes and intentions towards knowledge sharing in the Dubai Police Force', *International Journal of Information Management*, 32(4), pp. 372–380.
- Sekaran, U. and Bougie, R. (2016) *Research methods for business: A skill building approach*. John Wiley & Sons.
- Shahi, S. (2017) 'Human Capital: A Powerful Investment for Organizational Growth and Success', in: *International Conference on Technology and Business Management April*, p. 12.
- Sheikh Khalifa Government Excellence Program (2020) *Excellence Award Overview*. Available at: <https://www.zu.ac.ae/main/en/SFD/OSP/Excellence%20Award%20Overview.aspx> (Accessed: 12 November 2020).
- Shove, E. (2007) *The design of everyday life*. Berg.
- Shrouty, V. and Tiwari, P. (2017) 'Business Excellence: A Comparative Study of Various Models, Criteria and Awards', *International Research Journal of Engineering and Technology*, 4(6), pp. 38–44.
- Simon, H. A. (1996) 'The sciences of the artificial (Vol. 136)', *Designing the Immaterial Society*, 4(1/2), pp. 67–82.

- Simone, S. (2020) 'Knowledge management in a COVID-19 world', *KM World*, 8 March. Available at: <https://www.kmworld.com/Articles/News/News/Knowledge-management-in-a-COVID-19-world-142172.aspx> (Accessed: 3 December 2020).
- Skok, W. and Tahir, S. (2010) 'Developing a knowledge management strategy for the Arab world', *The Electronic Journal of Information Systems in Developing Countries*, 41(1), pp. 1–11.
- Sloan, L. and Quan-Haase, A. (2017) *The SAGE handbook of social media research methods*. Sage.
- Smadi, M. S. and Al-Khawaldeh, K. (2006) 'The adoption of total quality management (TQM) in Dubai manufacturing firms', *Jordan Journal of Business Administration*, 2(4), pp. 627–642.
- Smith, A. (1987) *The Essential Adam Smith*. WW Norton & Company.
- Smith, R. C. and Iversen, O. S. (2018) 'Participatory design for sustainable social change', *Design Studies*, 59, pp. 9–36.
- Snyder, K. M., Eriksson, H. and Raharjo, H. (2020) 'The management index: simplifying business excellence for management teams?', *International Journal of Quality and Service Sciences*, 12(4), pp. 505–520.
- Squires, S. and Byrne, B. (2002) *Creating breakthrough ideas*.
- Stackowiak, R. and Kelly, T. (2020) 'Design Thinking Overview and History', in *Design Thinking in Software and AI Projects*. Springer, pp. 1–16.
- Stading, G. and Vokurka, R. (2003) 'Building quality strategy content using the process from national and international quality awards', *Total Quality Management & Business Excellence*, 14(8), pp. 931–946.
- Sternad, D., Krenn, M. and Schmid, S. (2019) 'Business excellence for SMEs: motives, obstacles, and size-related adaptations', *Total Quality Management & Business Excellence*, 30(1–2), pp. 151–168.
- Stevens, E. (2019) *What Exactly Is Design Thinking?* Available at: <https://careerfoundry.com/en/blog/ux-design/what-is-design-thinking-everything-you-need-to-know-to-get-started/> (Accessed: 10 November 2020).
- Stone, M. (1974) 'Cross-validation and multinomial prediction', *Biometrika*, 61(3), pp. 509–515.
- Stoyanova, T. and Iliev, I. (2017) 'Employee engagement factor for organizational excellence', *International Journal of Business and Economic Sciences Applied Research (IJBESAR)*, 10(1), pp. 23–29.
- Strack, R. et al. (2009) *Creating people advantage – how to address HR challenges worldwide through 2015*. Boston Consulting Group.

Suárez, E. *et al.* (2017) 'Quantitative research on the EFQM excellence model: A systematic literature review (1991–2015)', *European Research on Management and Business Economics*, 23(3), pp. 147–156.

Suchman, L. A. (1987) *Plans and situated actions: The problem of human-machine communication*. Cambridge university press.

Sudsomboon, W. (2018) 'Application of Design Thinking Method to Promote Students Creativity in Rapid Prototyping for Industrial Computer Interactions', in *Application of Design Thinking Method to Promote Students Creativity in Rapid Prototyping for Industrial Computer Interactions* Editorial Staff. *Application of Design Thinking Method to Promote Students Creativity in Rapid Prototyping for Industrial Computer Interactions*, Thailand, p. 614.

Suliman, A. and Hayat, R. (2011) 'Leadership in the UAE', *Leadership development in the Middle East*, 104(34), pp. 22–27.

Susskind, R. E. and Susskind, D. (2015) *The future of the professions: How technology will transform the work of human experts*. Oxford University Press, USA.

Tabachnick, B. G., Fidell, L. S. and Ullman, J. B. (2007) *Using multivariate statistics*. Pearson Boston, MA.

Talwar, B. (2011) 'Business excellence models and the path ahead...', *The TQM Journal*, 23(1), pp. 21–35.

Tan, K. C. (2002) 'A comparative study of 16 national quality awards', *The TQM magazine*.

Tari, J. J. (2006) 'Improving service quality in a Spanish police service', *Total Quality Management & Business Excellence*, 17(3), pp. 409–424.

Tavory, I. and Timmermans, S. (2019) 'Abductive analysis and grounded theory', in *The SAGE handbook of current developments in grounded theory*. Sage Publications, pp. 532–546. Available at: <https://methods.sagepub.com/book/the-sage-handbook-of-grounded-theory-2e/i3871.xml>.

Thawani, S. (2015) 'Achieving & Sustaining Excellence in Public Services', in *ASQ MENA Regional Quality Conference 2015*, Dubai: ASQ. Available at: <https://www.qualityindeed.com/download/publications/19.pdf>.

Thiagaragan, T., Zairi, M. and Dale, B. (2001) 'A proposed model of TQM implementation based on an empirical study of Malaysian industry', *International Journal of Quality & Reliability Management*, 18(3), pp. 289–306.

Tickle, M., Mann, R. and Adebajo, D. (2016) 'Deploying business excellence—success factors for high performance', *International Journal of Quality & Reliability Management*, 33(2), pp. 197–230.

Tlaiss, H. A. and Kauser, S. (2019) 'Entrepreneurial leadership, patriarchy, gender, and identity in the Arab world: lebanon in focus', *Journal of Small Business Management*, 57(2), pp. 517–537.

Tlaiss, H. and Kauser, S. (2011) 'The importance of wasta in the career success of Middle Eastern managers', *Journal of European Industrial Training*.

Toma, S.-G. and Marinescu, P. (2018) 'Business excellence models: a comparison', in. *Proceedings of the International Conference on Business Excellence*, Sciendo, pp. 966–974.

Toma, S.-G. and Naruo, S. (2017) 'Total quality management and business excellence: the best practices at Toyota Motor Corporation', *Amfiteatru Economic Journal*, 19(45), pp. 566–580.

Trompenaars, F. and Woolliams, P. (2004) *Business across cultures*. John Wiley & Sons.

Twaissi, N. M. (2008) *An evaluation of the implementation of Total Quality Management (TQM) within the Information and Communications Technology (ICT) sector in Jordan*. Doctoral. University of Huddersfield. Available at: <http://eprints.hud.ac.uk/id/eprint/5010/1/ntwaissifinalthesis.pdf>.

Uebernickel, F. *et al.* (2020) *Design Thinking: The Handbook*. World Scientific.

Unnikrishnan, P., Tikoria, J. and Agariya, A. K. (2019) 'TQM to business excellence: a research journey (1985-2018)', *International Journal of Business Excellence*, 19(3), pp. 323–363.

Vechakul, J., Shrimali, B. P. and Sandhu, J. S. (2015) 'Human-centered design as an approach for place-based innovation in public health: a case study from Oakland, California', *Maternal and Child Health Journal*, 19(12), pp. 2552–2559.

Veselova, A. (2016) 'The motivation and barriers for implementing the European foundation for quality management business excellence model in Latvian enterprises', *New Challenges of Economic and Business Development–2016*, 12, p. 891.

Veselova, A. (2019) 'A comparison of Business Excellence Models', *Scientific Programme Committee*, 16, p. 892.

Von Thienen, J. P. *et al.* (2018) 'Theoretical foundations of design thinking', in *Design Thinking Research*. Springer, pp. 13–40.

Vroom, V., Porter, L. and Lawler, E. (2005) 'Expectancy theories', *Organizational behavior*, 1, pp. 94–113.

Wattanasupachoke, T. (2012) 'Design thinking, innovativeness and performance: An empirical examination.', *International Journal of Management & Innovation*, 4(1), pp. 1–14.

Webb, S. P. (2017) *Knowledge management: Linchpin of change*. Routledge.

- Wen, D. *et al.* (2016) 'A dynamic analysis on implementing performance excellence model: Importance, achievement and correlations', *Computers & Industrial Engineering*, 101, pp. 338–351. doi: 10.1016/j.cie.2016.09.024.
- Wetzels, M., Odekerken-Schröder, G. and Van Oppen, C. (2009) 'Using PLS path modeling for assessing hierarchical construct models: Guidelines and empirical illustration', *MIS quarterly*, 33(1), pp. 177–195.
- Williams, E. N. and Morrow, S. L. (2009) 'Achieving trustworthiness in qualitative research: A pan-paradigmatic perspective', *Psychotherapy research*, 19(4–5), pp. 576–582.
- Williams, R. *et al.* (2006) 'Self-Assessment Against Business Excellence Models: A Critique and Perspective', *Total Quality Management & Business Excellence*, 17(10), pp. 1287–1300. doi: 10.1080/14783360600753737.
- Winzer, P. and Sitte, J. (2004) 'Systems Engineering: Old ideas, new potential', in *2004 IEEE International Conference on Systems, Man and Cybernetics (IEEE Cat. No. 04CH37583)*, IEEE, pp. 2150–2155.
- Woliński, B. and Bala, S. (2018) 'Comprehensive business process management at siemens: implementing business process excellence', in *Business Process Management Cases*. Springer, pp. 111–124.
- Woody, E. (2011) 'An SEM perspective on evaluating mediation: What every clinical researcher needs to know', *Journal of Experimental Psychopathology*, 2(2), pp. 210–251.
- World Economic Forum (2015) *The Fourth Industrial Revolution*. Available at: <https://www.youtube.com/watch?v=SCGV1tNBoeU&feature=youtu.be> (Accessed: 8 October 2020).
- Wrigley, C. and Straker, K. (2017) 'Design Thinking pedagogy: the Educational Design Ladder', *Innovations in Education and Teaching International*, 54(4), pp. 374–385. doi: 10.1080/14703297.2015.1108214.
- Wruck, K. H. and Jensen, M. C. (1994) 'Science, specific knowledge, and total quality management', *Journal of Accounting and economics*, 18(3), pp. 247–287.
- Wylant, B. (2008) 'Design thinking and the experience of innovation', *Design Issues*, 24(2), pp. 3–14.
- Xie, M. *et al.* (1998) 'A comparative study of nine national quality awards', *The TQM Magazine*.
- Yousuf, M. I. (2007) 'Using experts opinions through Delphi technique', *Practical assessment, research, and evaluation*, 12(1), p. 4.

Zairi, M. and Alsughayir, A. A. (2011) 'The adoption of excellence models through cultural and social adaptations: An empirical study of critical success factors and a proposed model', *Total Quality Management & Business Excellence*, 22(6), pp. 641–654.

Zairi, M. and Youssef, M. A. (1995) 'Benchmarking critical factors for TQM', *Benchmarking for Quality Management & Technology*, 2(2), pp. 3–19.

Zdrilić, I. and Dulčić, Ž. (2016) 'Business excellence as a success factor for the performance of large Croatian enterprises', *Management: journal of contemporary management issues*, 21(1), pp. 145–162.

Zeithaml, V. A., Bitner, M. J. and Gremler, D. D. (2018) *Services marketing: Integrating customer focus across the firm*. McGraw-Hill Education,.

Zhang, Y. (2009) 'A study of corporate reputation's influence on customer loyalty based on PLS-SEM model', *International Business Research*, 2(3), p. p28.

Žurga, G. (2017) 'Added value of the Slovenian Business Excellence Prize', in. *The 12th IRDO International Scientific Conference Social Responsibility and current challenges*.

8. Appendices

a. Appendix (A) Questionnaire Cover Letter

Questionnaire Cover Letter

Dear Participant,

The primary objective of my research is to investigate the influence of design thinking determinants on business excellence implementation requirements in the public sector in Dubai through a questionnaire. Your input will help us to find the relationships between attitude, knowledge and action with the business excellence model implementation outcomes, and whether those relationships are moderated by design thinking determinants. We have estimated that it will take you approximately 20-25 minutes to complete the survey.

All individual responses will remain confidential and study data will be integrated and analysed as a whole. The research outcome will be reported in a summary form to protect confidentiality. However, if you have any concerns or questions about the questionnaire or about participating in this research, you may contact me on 20170008@student.buid.ac.ae.

Alternatively, you may communicate my director of studies, Professor Abubakr Suliman on 04 279 1437.

Thank you for your time and support and I look forward to sharing the results of this survey with all of the participants

Yours faithfully
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b. Appendix (B) Attitude Questions

PART 1 Attitude toward business excellence

INSTRUCTIONS: Please read each statement and rate your agreement on how you feel about each of the statements.

Attitude toward business excellence	Strongly agree	Agree	Slightly Agree	Undecided	Slightly Disagree	Disagree	Strongly disagree
My organization's employees have a positive view toward business excellence implementation							
My organization's employees feel proud of our organization excellence							
In my organization excellence implementation requirements are an additional workload.							
In my organization excellence implementation requirements are embedded in the daily tasks.							
My organization's employees find it meaningless to win awards							

My organization's leaders are committed toward the objectives of excellence implementation.							
Leaders in my organization support creating an excellence culture							
My organization is comfortable in taking risks associated with excellence implementation							

c. Appendix (C) Knowledge Questions

PART 2 Knowledge of business excellence

INSTRUCTIONS: Please read each statement and rate your agreement on how you feel about each of the statements.

Knowledge of business excellence	Strongly agree	Agree	Slightly Agree	Undecided	Slightly Disagree	Disagree	Strongly disagree
In my organization excellence implementation requirements are an additional workload.							
In my organization excellence requirements are part of routine work knowledge.							
In my organization excellence implementation outcomes are clearly identified.							
In my organization, leaders have a good understanding of the difficulties facing excellence implementation.							
My organization's employees have clearly understood the link between their work practices and the organization's objectives related to excellence.							
My organization employees receive the training needed for excellence implementation.							
In my organization there is a mutual understanding of excellence implementation requirements across all levels							

In my organization, the right capabilities are present to implement excellence requirements.							

d. Appendix (D) Action Questions

PART 3 – Action on business excellence

INSTRUCTIONS: Please read each statement and rate your agreement on how you feel about each of the statements.

Action on business excellence	Strongly agree	Agree	Slightly Agree	Undecided	Slightly Disagree	Disagree	Strongly disagree
Stakeholder feedback is part of my organization culture in business excellence implementation.							
My organization's policies support employees in achieving excellence objectives.							
In my organization the decisions are taken at strategic level to fulfil business excellence requirements.							
In my organization the actions for excellence implementation are part of daily work.							
My organization IT systems support business excellence implementation.							
The organizational structure is designed to support business excellence implementation.							
My organization has a rewarding scheme for business excellence implementation.							
My organization has an excellence steering committee.							

e. Appendix (E) Empathize Questions

PART 4- Design thinking in business excellence

INSTRUCTIONS: Please read each statement and rate your agreement on how you feel about each of the statements.

4.1 Empathize	Strongly agree	Agree	Slightly Agree	Undecided	Slightly Disagree	Disagree	Strongly disagree
4.1.1 In my organization employees are actively involved in diverse phases of excellence implementation.							
4.1.2 In my organization, leaders are source of inspiration for identifying the direction of excellence implementation.							
4.1.3 In my organization, during planning phase for excellence, ample time is dedicated to assess employee needs.							
4.1.4 In my organization, employee perceptions about excellence implementation are understood by leaders.							
4.1.5 My organization's leaders are comfortable to see excellence implementation problems from the employees' point of view.							

f. Appendix (F) Define Questions

4.2 Define implementation problem	Strongly agree	Agree	Slightly Agree	Undecided	Slightly Disagree	Disagree	Strongly disagree
4.2.1. In my organization, the initial problems related to excellence implementation are reformulated in order to achieve a good result.							
4.2.2. My organization's leaders are interested in better understanding the problems related to excellence implementation.							
4.2.3. My organization's excellence team is capable to reformulate the initial excellence implementation problems statements.							
4.2.4. In my organization, new opportunities related to excellence implementation are sought.							
4.2.5. In my organization excellence teams seek as much information as possible in defining the problems.							

g. Appendix (G) Ideate Questions

4.3. Ideate for implementation	Strongly agree	Agree	Slightly Agree	Undecided	Slightly Disagree	Disagree	Strongly disagree
4.3.1. My organization's leaders prefer new versus familiar solutions for excellence implementation.							
4.3.2. My organization seeks new ideas in dealing with unsolved excellence implementation problems.							
4.3.3. My organization is adopting innovative solutions to enhance its excellence outcomes.							

4.3.4. In my organization, conclusions are built from the analyses of the available information.							
4.3.5. In my organization learning from failure is a source for generating ideas to solve problems.							

h. Appendix (H) Prototype Questions

4.4. Prototype of solutions	Strongly agree	Agree	Slightly Agree	Undecided	Slightly Disagree	Disagree	Strongly disagree
4.4.1. My organization creates prototypes to represent new ideas for excellence implementation.							
4.4.2. My organization experiment new solutions before implementing them.							
4.4.3. In my organization we can diagnose when there is a necessity to repeat one phase of the implementation process.							
4.4.4. My organization is comfortable to simulate alternative contexts of use of the solution.							
4.4.5. In my organization risk taking is promoted, even if it leads to mistakes and failure.							

i. Appendix (I) Excellence implementation Outcomes Questions

PART 5- Business excellence outcomes

INSTRUCTIONS: Please read each statement and rate your agreement on how you feel about each of the statements.

Excellence implementation Outcomes	Strongly agree	Agree	Slightly Agree	Undecided	Slightly Disagree	Disagree	Strongly disagree
In my organization, implementation of excellence drives to optimized revenues.							
In my organization implementation of excellence drives to a pioneering socially responsible practice.							
In my organization implementation of excellence drives to minimize environmental footprint.							
In my organization, implementation of excellence drives to meet the needs of all stakeholders.							
In my organization implementation of excellence drives to optimal utilization of various resources.							

In my organization, implementation of excellence increases the customer's happiness results.							
In my organization, excellence implementation drives to increase the productivity.							
In my organization, excellence implementation increases the employees' happiness results.							

j. Appendix (J) Demographic Questions

5.1 Gender	
	Male
	Female
5.2 Education	
	Less than bachelors
	Bachelors
	Master's degree
	Doctorate degree
5.3 Number of years worked in the organization	
	1 - 5
	6 - 10
	11 - 16
	17 - 20
	Above 20
5.4 Position	
	Leadership
	Management
	Non-supervisory
	Others, please specify.....

k. Appendix (K) E-Mail from Dubai Government Excellence program to all Dubai governments entities to fill my survey and a reminder



Wed 10/7/2020 12:27 PM

Dubai Government Excellence Program <dgep@tec.gov.ae>

Survey for "Using a design thinking-based framework for effective business excellence outcomes in the public sector "

To

You forwarded this message on 10/7/2020 2:17 PM.

الأخوات والإخوة منسقي برنامج دبي للتميز الحكومي المحترمين

يهدىكم برنامج دبي للتميز الحكومي أطيب التحيات والأمنيات بدوام التقدم والنجاح.

تجدون أدناه رابط لإستبيان خاص بإطروحة دكتوراه لباحث من هيئة كهرباء ومياه دبي مسجل لدراسة في الجامعة البريطانية دبي وموضوع الإطروحة " استخدام التفكير التصميمي لزيادة فاعلية تطبيق التميز في القطاع الحكومي " علماً بأن الباحث تعهد بالتعامل مع جميع الإجابات ونتائج البحث بسرية تامة واستخدامها لأغراض البحث فقط وعدم نشرها لأي أطراف خارجية دون موافقة خطية من البرنامج.

نرجو تعاونكم في تعبئة الإستبيان من قبل فريق القيادة والموظفين في مواقع إدارية بجهتكم الموقرة وسنوافيكم بنتائج ومخرجات الدراسة فور الإنتهاء منها.

الرابط:

<https://gebreel.iimequery.com/276223?lang=en>

وتفضلوا بقبول فائق الإحترام.

Dubai Government Excellence Program
The General Secretariat of the Executive Council of Dubai
P.O. Box: 72233, Dubai, UAE
DGEF Web : www.dgep.gov.ae



برنامج دبي للتميز الحكومي
الأمانة العامة للمجلس التنفيذي لإمارة دبي
ص.ب. 72233 دبي - إ.ع.م
موقع البرنامج : www.dgep.gov.ae



Gebreel Ahmad Mohd Almomany

From: Dubai Government Excellence Program <dgep@tec.gov.ae>
Sent: Monday, January 27, 2020 11:02 AM
Cc: Gebreel Ahmad Mohd Almomany
Subject: تعينة استبيان رسالة الدكتوراه للأخ جبريل محمد المومني

This is an External Email. If suspicious, report to: is.cdc@dewa.gov.ae

الأخوات والأخوة منسقي برنامج دبي للتميز الحكومي المحترمين
تحية طيبة وبعد،،،

يهدىكم برنامج دبي للتميز الحكومي أطيب التحيات ويتمنى لكم مزيداً من التقدم والنجاح.
يرجى التكرم بتعبئة الاستبيان لمن لم يقوم بذلك، وتعميمه على العاملين في التميز في جهتكم الموقرة وذلك لضمان توفير المزيد من الردود لدعم الأخ جبريل المومني في دراسته.
وتفضلوا بقبول وافر الاحترام،،،

Dubai Government Excellence Program
General Secretariat of the Executive Council of Dubai
Box: 72233, Dubai, UAE
E Web : www.dgep.gov.ae
للخبر
2020

دبي للتميز الحكومي
العامّة للمجلس التنفيذي لإمارة دبي
72233، دبي، إ.ع.م
برنامج : www.dgep.gov.ae
للخبر
2020

From: Dubai Government Excellence Program
Sent: Monday, January 20, 2020 10:23 AM
Cc: 'Gebreel.Almomany@dewa.gov.ae' <Gebreel.Almomany@dewa.gov.ae>
Subject: تعينة استبيان رسالة الدكتوراه للأخ جبريل محمد المومني

السادة منسقي برنامج دبي للتميز الحكومي المحترمين
1

تحية طيبة وبعد،،،

يهدىكم برنامج دبي للتميز الحكومي أطيب التحيات ويتمنى لكم دوام التقدم والنجاح.
بالإشارة إلى الموضوع المذكور أعلاه يرجى التكرم بتعبئة الاستبيان الخاص بأطروحة الدكتوراه من الجامعة البريطانية بدبي للأخ جبريل المومني والمتعلق باستخدام التفكير التصميمي لزيادة فاعلية تطبيق التميز في القطاع الحكومي من خلال الرابط التالي:

<https://gebreel.limequery.com/276223?lang=en>

هذا وتتمنى للأخ جبريل المومني التوفيق والنجاح في مسيرته العلمية.

وتفضلوا بقبول فائق الاحترام،،،

Dubai Government Excellence Program
General Secretariat of the Executive Council of Dubai
Box: 72233, Dubai, UAE
E Web : www.dgep.gov.ae
للخبر
2020

دبي للتميز الحكومي
العامّة للمجلس التنفيذي لإمارة دبي
72233، دبي، إ.ع.م
برنامج : www.dgep.gov.ae
للخبر
2020

I. Appendix (L) BUID Memo to Dubai government

12/22/2019

To: Dubai Government

This is to certify that Mr. Gebreel Al Momany with Student ID number 20170008 is a registered part-time student in the Phd in Project Management offered by The British University in Dubai since September 2017.



Mr. Al Momany is currently collecting data for his research (Using a design thinking-based model for effective business excellence outcomes in the public sector)

He is required to gather data through conducting surveys that will help him in writing the final research. Your permission to conduct his research in your organisation is hereby requested. Further support provided to his in this regard will be highly appreciated.

Any information given will be used solely for academic purposes.

This letter is issued on Mr. Al Momany's request.

Yours sincerely,



Dr. Amer Alaya
Head of Student Administration

m. Appendix (M) the references of the questionnaire measures

Variable	No.	Measure	Reference	Rationale for choosing these measures
A T T I T U D E	1	Employees are proud of organizational excellence	(Santos <i>et al.</i> , 2018)	Feelings of pride in the business excellence, finding achievement of goals to be meaningful, and having a committed leadership can develop empathy and make employees more willing to implement BE
	2	Employees find awards to be meaningful for excellence requirements.	(Lasrado & Gomiscek, 2017; Santos <i>et al.</i> , 2018)	
	3	Organization's leaders are committed to achieving the objectives of excellence implementation.	(Krajcsák, 2019; Sternad, Krenn & Schmid, 2019)	
	4	Employees are positive towards business excellence requirements	(Tickle, Mann & Adebanjo, 2016)	
	5	Excellence requirements are not an additional workload for employees	(Lasrado & Gomiscek, 2017; Snyder, Eriksson & Raharjo, 2020)	Positive employees who do not consider BE to be an encumbrance and are provided an enabling culture are more likely to be clear about BE requirements.
		Leaders support creating an excellence culture	(Krajcsák, 2019; Sternad, Krenn & Schmid, 2019)	

		Employees have a positive attitude towards ideating about business excellence requirements	(Andersen & Jessen, 2007b; Elsbach & Stigliani, 2018)	
		Excellence requirements are embedded in the daily tasks.	(Lasrado & Gomiscek, 2017; Escrig-Tena, Garcia-Juan & Segarra-Ciprés, 2019b)	Positive attitudes with BE requirements embedded in daily tasks and a committed leadership make ideation for implementation easier.
		Top leaders are committed to business excellence	Krajcsák, 2019; Sternad, Krenn & Schmid, 2019)	
		Organization is comfortable in taking risks associated with excellence implementation	(Andersen & Jessen, 2007b)	
		Leaders encourage changes and support a stimulating, knowledge-sharing culture	(Bouranta, 2020)	Organizations can proceed with implementation only when organizations are willing to take risks and share knowledge
		Employees support the identification of improvements	(Tickle, Mann & Adebajo, 2016)	
		Employees remain positive about business excellence requirements for the next cycle.	(Andersen & Jessen, 2007b; Elsbach & Stigliani, 2018)	Reviews are made possible by employee support for improvements and implementation in the next cycle of BE.

Measures for attitude variable

Variable	No.	Measure	Studies	Rationale
K N O W L E D G E	1	Sharing of success stories to promote excellence	(Gloet & Samson, 2017; Santos <i>et al.</i> , 2018)	Human capital recognizes the need for knowledge and appreciates it.
	2	Organization possesses the required knowledge to implement excellence	(Andersen & Jessen, 2007b)	
	3	Excellence requirements are part of routine work knowledge	(Muthuveloo, Shanmugam & Teoh, 2017; Ghobakhloo & Azar, 2018)	Human capital can define and understand the issues in business excellence implementation
	4	Excellence implementation outcomes are clearly identified	(Obeidat, Al-Suradi & Tarhini, 2016; Bolisani & Bratianu, 2018)	

	5	Leaders have a good understanding of the difficulties facing excellence implementation.	(Bouranta, 2020)	
	6	Employees have clearly understood the link between their work practices and the organization's objectives related to excellence.	(Andersen & Jessen, 2007b; Elsbach & Stigliani, 2018)	Human capital is able to build upon existing knowledge
	7	Employees receive the training needed for excellence implementation	(Lasrado & Gomiscek, 2017; Jaeger, 2018; Santos <i>et al.</i> , 2018)	
	8	There is a mutual understanding of excellence implementation requirements across all levels	(Androniceanu, 2017; Lasrado & Gomiscek, 2017)	Employees can create prototypes for achieving BE outcomes
	9	The right capabilities are present to implement excellence requirements	(Androniceanu, 2017; Lasrado & Gomiscek, 2017; Carvalho <i>et al.</i> , 2019)	
	10	Leaders understand how to identify loopholes and take steps to rectify them.	(Krajcsák, 2019; Sternad, Krenn & Schmid, 2019)	Leaders and employees are onboard to make changes in the existing knowledge framework.
	11	Employees are onboard to accept changes and make changes.	(Andersen & Jessen, 2007b; Elsbach & Stigliani, 2018)	

Measures for Knowledge Variable

Variable	No	Measure	Studies	Rationale
A C T I O N	1	Decisions are taken at strategic level to fulfil business excellence requirements.	(Androniceanu, 2017; Lasrado, 2018)	Strategic direction and policies are needed to clarify what steps are needed to operationalize the existing knowledge and attitudes for BE.
	2	Organization's policies help develop awareness about actions needed to implement BE.	(Lasrado & Gomiscek, 2017; Nizamidou & Vouzas, 2020)	
	3	Organizational structure is designed to support business excellence implementation.	(Jabnoun, 2019; Kassem <i>et al.</i> , 2019)	The organizational structure and systems should support the actions needed to implement BE.
	4	IT systems support business excellence implementation.	(Androniceanu, 2017; Lasrado & Gomiscek, 2017; Santos <i>et al.</i> , 2018; Kassem <i>et al.</i> , 2019)	
	5	Organization's policies support employees in achieving excellence objectives.	(Lasrado & Gomiscek, 2017;	Policies clarify the idea of actions while they are manifested in daily practices of employees.

			Nizamidou and Vouzas, 2020)	
	6	The actions for excellence implementation are part of daily work	(Stoyanova & Iliev, 2017)	
	7	Stakeholder feedback is part of the organization culture in business excellence implementation	(Ferdowsian, 2016; Kassem <i>et al.</i> , 2019)	Leaders elicit opinions from stakeholders and provide rewards for effective prototype actions.
	8	Organization has a rewarding scheme for business excellence implementation.	(Armstrong & Taylor, 2020).	
	9	Organization has an excellence steering committee.	(Tickle, Mann & Adebajo, 2016; Adamek, 2018)	Prototypes are tested through the direction of a steering committee which ensure that human capital works together to implement actions.
	10	Leaders and employees work together to take actions for improving business excellence	(Abubakar <i>et al.</i> , 2019).	

Measures for actions variable

Variable	No	Measure	Studies	Rationale
E X C E L L E N C E I M P L E M E N T A T I O N O U T C O	1	Rank in Dubai government excellence program	DGEP Announcements (every three years with last one announced on Feb 2020)	It is important to assess how well results are able to justify the excellence framework
	2	Implementation of excellence drives to optimized revenues	(Lasrado & Gomiscek, 2017; Woliński & Bala, 2018)	
	3	Implementation of excellence drives to a pioneering socially responsible practice.	(Hammad, Dweiri & Ojiako, 2020)	
	4	Implementation of excellence drives to minimize environmental footprint.		
	5	Implementation of excellence drives to meet the needs of all stakeholders.	(Adamek, 2018; Carvalho <i>et al.</i> , 2019)	
	6	Implementation of excellence drives to optimal utilization of various resources.	(Ghobakhloo & Azar, 2018; Carvalho <i>et al.</i> , 2019)	
	7	Implementation of excellence increases the customer’s happiness results.	(Lasrado, 2018; Jabnoun, 2019)	
	8	Excellence implementation drives to increase the productivity	(Lasrado & Gomiscek, 2017; Woliński & Bala, 2018)	
	9	Excellence implementation increases the employees’ happiness results.	Dubai happiness meter annual report	

M E				
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Measures for business excellence outcomes.

Variable	Phases	No	Items	Studies	Rationale
D E S I G N T H I N K I N G	Empathize	1	Employees are actively involved in diverse phases of excellence implementation.	(Bobrek, Majstorovic & Sokovic, 2006; Beckman & Barry, 2007; Design Council, 2011; Boy, 2017; Bertolotti, Di Norcia and Vignoli, 2018; Chou, 2018; Micheli <i>et al.</i> , 2019)	It is necessary to develop empathy with the organizational needs, objectives, strategy, culture, and capabilities before designing and implementing business excellence
		2	Leaders are source of inspiration for identifying the direction of excellence implementation.		
		3	During planning phase for excellence, ample time is dedicated to assessing employee needs.		
		4	Employee perceptions about excellence implementation are understood by leaders		
		5	Organization's leaders are comfortable to see excellence implementation problems from the employees' point of view		
	Define	1	The initial problems related to excellence implementation are reformulated in order to achieve a good result.		The collected observations are collated to understand and define the needs of the organization
		2	Organization's leaders are interested in better understanding the problems related to excellence implementation		
		3	Organization's excellence team is capable to reformulate the initial excellence implementation problems statements		
		4	New opportunities related to excellence implementation are sought		
		5	Excellence teams seek as much information as possible in defining the problems.		
	Ideate	1	Leaders prefer new versus familiar solutions for excellence implementation.		Employees come together with leaders to reflect, assess, brainstorm, and build alternatives for meeting goals.
		2	Organization seeks new ideas in dealing with unsolved excellence implementation problems.		
		3	Organization is adopting innovative solutions to enhance its excellence outcomes.		
		4	Conclusions are built from the analyses of the available information.		
		5	Learning from failure is a source for generating ideas to solve problems.		
	Prototype	1	Prototypes are created to represent new ideas for excellence implementation.		Prototypes are small scale, lower risk and magnitude solutions that
		2	Organization experiments with new solutions before implementing them.		

		3	Employees can diagnose when there is a necessity to repeat one phase of the implementation process.		are employed to check alternatives. They can help in assessing the impact of far-reaching decisions
		4	Organization is comfortable to simulate alternative contexts of use of the solution.		
		5	Risk taking is promoted, even if it leads to mistakes and failure.		
	Test	1	Solutions are tested and then implemented for maximum impact.		New solutions, prototypes, and processes are tested before final launch. This step can improve the understanding of the new context and allow incremental, iterative changes.

Relationship between design thinking and business excellence implementation

n. Appendix (N) Arbitration of the study questionnaire.

Title	Name	Brief / profile	Main comments	Applicability
Dr	Robin Mann	Head of the Centre for Organizational Excellence Research, Massey University, New Zealand. Robin obtained his PhD in TQM at Liverpool University in 1992. Robin is currently overseeing a research project involving 30 countries to understand how business excellence initiatives impact nation building.	<ul style="list-style-type: none"> Targeting people to complete the questionnaire who have knowledge of their organization's business excellence approach which can be the BE managers/directors etc. Potentially you could have questions in each part about different aspects of excellence covering the core principles of excellence and/or major categories of excellence rather than solely generic questions Organizations which have a more positive attitude and understanding and actions related to each core principle are likely to have better outcomes 	<p>Accepted and implemented.</p> <p>Accepted partially. The questions are designed to measure the attitude, knowledge and actions but not all core principles of excellence as those are out of the research purview</p> <p>Accepted and applied.</p> <p>Literature review showed strong support for inclusion of risks so suggestion was not incorporated.</p> <p>Accepted and applied.</p> <p>Accepted and applied.</p>
			<p>Perception to be called Attitude aligned to business excellence</p> <p>- 1.8: - "I am not sure people will understand this... what risks? "</p> <p>In the topic of part2 to add of Business Excellence for Knowledge to Be "Knowledge of Business Excellence"</p> <p>- 2.2 "What is work knowledge?"</p> <p>- 3. Topic of part 3 to be "Action on Business Excellence"</p>	

			4.3.3 In my organization the idea that a solution can result from unexpected directions is accepted.	Accepted and applied.
			4.3.4 In my organization conclusions are built from the analyses of the available information	Accepted and applied.
			4.4.4 we are able	Accepted and applied.
			4.4.6 In my organization risk taking is promoted, even if it leads to mistakes and failure	Accepted and applied.
Prof.	Stefan Hagmann	Holds a PhD in Business Administration from the University of Mannheim (Germany) where he worked as a Project Lead and Researcher. Stefan has more than 20 years of proven practice in helping organisations improve their performance using the holistic EFQM Excellence Model as a reference.	I think your questionnaire is ok but : - Runs longer than 30 min. - A seven-point scale is good for further parametric analysis. - Some of your items are suggestive and give more than one option to answer into (e.g., come with 'and'). You should avoid this.	Partially applicable Accepted and applied. Accepted and applied.
Prof.	Ibrahim Rawabdeh	Executive Director – King Abdullah II Centre For Excellence, Professor of Industrial Engineering Department, University of Jordan, Amman, Jordan March 2012	We are on the same page 1.1 positive view is too general 1.6 Is there a difference between top management and leaders? 1.6 The word fulfilment is not suitable for top management 1.7 Is it support creating or creating? 2.2. Not clear what do you mean with work knowledge 2.5 which level 3.3. This question is misleading	Helpful in increasing confidence in the research Not applicable as field observations showed respondents did not have any issues. Accepted and applied. Accepted and applied. Not applicable Accepted and applied. Accepted and applied. Accepted and applied.

			Is it right to have excellence work day-to-day works?	
			3.4 What do you mean it is computer-based?	Accepted and applied.
			4.1.2 Not people it is leaders	Accepted and applied.
			4.1.5 Which level	Accepted and applied.
			4.2.1 "reframed" It is not the right word	Accepted and applied.
			4.2.2 You mentioned several groups	Accepted and applied.
			- Leaders	
			- Top management	
			- Management	
			- Management team	
			This level of classification is misleading	
			4.2.3 What is initial problems statement?	Accepted and applied.
			4.2.5 How they know that they do not know	Accepted and applied.
			4.3.4 Too much I think you mean improve / innovate	Accepted and applied.
			4.4.1 Too much to ask for	Not applicable
			4.4.2 Same as above prototyping is the same as experimenting	Not applicable
			4.4.5 Difficult	Applicable, invent or removed
			4.4.6 Too much to ask	Not applicable
			5.6 needs explanation	Accepted and applied.
Dr	Naseem M. M Twaissi	Associate Professor-in Business Administration: Total Quality Management - Al-Hussein Bin Talal University /AHU – Business Administration Department. Dr Twaissi holds a PhD in Business Administration from the University of Huddersfield UK in 2009. He has several published research papers published in international refereed journals related mainly to total quality management and strategic management	1.0 To be in consistent with the conceptual framework in the topic of attitude	Accepted and applied.
			1.1 organizations'	Not applicable, Will change the meaning
			1.2 Employees could understand success and excellence differently, it could mean different things to each employee. Furthermore, we cannot ask about two different things in the same sentence	Accepted and applied.
			1.5 organizations'	Not applicable
			1.6 the term Top management is used in this sentence and term leadership in the one after it. Is there a difference?	Accepted and applied.
			Part 2. Why are the instructions different in this part from part one	Accepted and applied.
			2.1 Unclear what does ability mean	Not applicable
			not clear	
			2.2 In the sentence that measures knowledge it is better	Not applicable

to use measures knowledge instead of knowledge	
2.4 What do you mean by complexity	Applicable, changed to difficulty
2.7 Do you mean levels of management	Accepted and applied.
2.8 What is meant by right capabilities	Accepted and applied.
3.2 My organization has an excellence steering & technical committee	Applicable, technical is removed
use one term	
4.1 Focus on users' need & Employees' engagement	Accepted and applied.
4.1.4 My organization's employees' feelings about excellence implementation is understood by management	Accepted and applied.
4.1 All above questions about employees, where are the users' need?	Not applicable to the current research purpose
4.2.2 Management team excellence team	Accepted and applied.
Are they the same team or a different team	
4.2.5 not clear	Accepted and applied.
4.3.3 not clear	Accepted and applied.
4.3.4 not understood	Accepted and applied.
move last question	
4.4.6 Not understood how can we judge learning in an organization	Accepted and applied.
5.1 Where are the options?	Not applicable
5.3 Less than high school Is he able to provide good answers to this issue	Not applicable
5.4 . (1 – 5) Is an employee with one-year experience able to give good answers to this subject	Yes, as suggested by field observations and literature review.
5.4 (10 – 20, 11-20) why are the categories uneven, I suggest: 1-5 6-10 11-15 16-20 above 20	Accepted and applied.
Thank you for <u>successfully</u> completing this questionnaire.	Not applicable as the questionnaire is online one
This word is appropriate if this was a questionnaire online	
I suggest	
Thank you for your cooperation	

Arbitrators' feedback for the research questionnaire

o. Appendix (O): Steps of the Design thinking based framework for effective business excellence implementation provided in this study

Activities may include	Responsibility	Time Frame		Observations
		Start	End	
<ul style="list-style-type: none"> Gain the support of leaders and employees in the organization and Ensure their effective participation in acquiring, understanding, and transferring the concepts and requirements of excellence and Adopt the associated practices in their work. 	Leaders of the organization with excellence champions			<ul style="list-style-type: none"> The first step in the design thinking-based framework is empathizing the most important needs of the employees (users) from their point of view. This step explores the real needs, obstacles and problems faced by the organization's employees in implementing business excellence requirements. It avoids any prior assumptions to reach the root causes of the problems and obstacles without any barriers. The excellence planners should put themselves in the place of employees to plan and design the most effective actions, initiatives, and decisions that meet the needs, exceed expectations, and achieve all goals.
<ul style="list-style-type: none"> Communicate directly with employees at all levels through meetings, interviews and questionnaires to determine their real needs and point of view in the best ways to meet the requirements of implementing business excellence requirements and Identify the difficulties and obstacles they face and how to overcome them. 	Excellence champions			
<ul style="list-style-type: none"> Find ways of building awareness about the concepts and requirements of excellence to meet the needs of employees as per their point of view. Create a training calendar that provides support for meeting these needs. 	Excellence champions			
<ul style="list-style-type: none"> Any other suggestions and initiatives received by 	Excellence champions			

different official or nonofficial communications channels like emails, suggestion systems, face to face meetings, toolbox.					
<ul style="list-style-type: none"> It is recommended as per previous practices to establish an excellence steering committee headed by the organization leader, Form excellence implementations teams with each team headed by a designated leader according to the scope of the excellence model criteria 	Top Management				

Diagnosis and Identifying gaps (Define)

Activities may include	Responsibility	Time Frame		Observations
		Start	End	
<ul style="list-style-type: none"> Circulate the latest criteria concepts, and assessment mechanism of the followed business excellence model, as well as external and internal excellence assessments reports, to all concerned in the organization 	Excellence champions			<p>In this step, all the information gathered in the previous step is integrated, merged, and analysed, to define all aspects of the needs, problems and obstacles faced by the employees in the implementation of the excellence requirements and collect their views to reach the implementation goals efficiently and effectively.</p>
<ul style="list-style-type: none"> Identify gaps, activities, and procedures to be implemented in the organization to work on the areas of improvements mentioned in the assessment reports. In addition to the activities, initiatives and ideas proposed by 	Excellence implementation teams Excellence champions			

all internal excellence teams, departments, divisions and concerned leaders are collated to emphasize the organization's strengths in meeting the requirements.					
<ul style="list-style-type: none"> Analysis of the organization's internal and external context to determine any areas of improvements outside the assessment's reports and within the scope of the excellence model criteria, based on the outcomes of the implementation in the previous cycles. 	Excellence implementation teams				
<ul style="list-style-type: none"> Collect, classify, and analyse the qualitative and quantitative data collected in the previous steps using the available methods Discuss the findings with all concerned users and present the recommendations 	Excellence implementation teams Excellence champions				

Diagnosis and Gap identification

Capturing ideas and initiatives
(Ideate)

Activities may include	Responsibility	Time Frame		Observations	<ul style="list-style-type: none"> This step includes the creation of alternatives, ideas, and initiatives for the efficient and effective implementation of business excellence in the organization based on the findings of data analysis and the information
		Start	End		
<ul style="list-style-type: none"> Gather ideas and initiatives proposed by all stakeholders who affect and are affected by applying the requirements of excellence in the organization 	Excellence implementation teams Excellence champions				

<ul style="list-style-type: none"> Discuss the gathered ideas internally with the organization's excellence teams' members and all important stakeholders and Take any received comments into consideration and agree about the evaluation criteria 	Excellence champions Excellence teams Concerned organization's leaders				gathered in the previous steps. <ul style="list-style-type: none"> The planner/ designer needs to refer to the employees and leaders in the organization to test the proposed solutions to ensure that they meet the designated needs
<ul style="list-style-type: none"> Evaluate the captured ideas based on certain criteria and Identify those ideas which are applicable and feasible 	Excellence implementation teams Excellence champions				
<ul style="list-style-type: none"> Adopt applicable ideas and initiatives and Identify the actions and resources needed to implement them for inclusion in later business plans. 	Excellence champions Concerned organization's leaders				

Capture ideas and initiatives

Prepare action plans (Prototype Solutions)

Activities may include	Responsibility	Time Frame		Observations
		Start	End	
				<ul style="list-style-type: none"> After defining and understanding the root causes of the excellence implementations problems, and agreeing about the right solutions, ideas, and initiatives with the users and implementers within the organization. In this step, action plans are developed to

					<p>implement the agreed solutions, ideas, and initiatives.</p> <ul style="list-style-type: none"> • The action plans should include the actions needed for implementation with clear responsibilities, implementation time frame, and the financial and nonfinancial needs resources. • These plans need to be discussed with all concerned within the organization to ensure that they will help meet the needs and expectations of all stakeholders. • They will also be more likely to be approved by the top management.
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(Monitoring and Evaluation)

Activities may include	Responsibility	Time Frame		Observations
		Start	End	
<ul style="list-style-type: none"> • Follow up implementation based on the approved action plans 	Excellence champions			
<ul style="list-style-type: none"> • Review any change requests to modify the action plans with the excellence implementation teams and • Recommend the amendments as per the rules. 	Excellence champions			
<ul style="list-style-type: none"> • Submit periodic reports from the excellence implementation teams on the progress of the action plans after 	Excellence implementation teams Excellence champions			

- Apply positive monitoring and evaluation processes aimed at correcting deviations by measuring the actual performance and comparing it with the targeted performance in work plans,
- Meet the requirements for excellence,
- Identify deviations,

discussions with the excellence champions who, collect, integrate, and • Submit the final report to the head of the excellence steering committee					• Research their causes, and • Take appropriate corrective and preventive decisions and • Obtain periodic reports on work progress while implementing the plans
• Conduct periodic excellence coordination meetings as agreed and whenever the need arises, headed by chairman of the excellence steering committee, and all the excellence implementation team heads, and the division heads and • In this meeting, each team head presents what has been achieved by his team, any implementation problems faced or issues needing an immediate decision from the steering committee.	Excellence Steering committee Excellence implementation teams Excellence champions				

Monitor and Evaluate

Pre-Assessment Preparation (Testing)

Activities may include	Responsibility	Time Frame		Observations	This step measures the effectiveness outcomes of the initiatives, ideas, and solutions implemented in the previous steps.
		Start	End		
• Prepare the presentations and videos representing all the latest achievements in line with the requirements of the	Implementation excellence teams Excellence champions				

followed excellence model					
<ul style="list-style-type: none"> Prepare the related documents and evidence in one place with a clear description of the documentation process, ensuring ease and quick accessibility for the presenters during any internal or external assessment. 	Implementation excellence teams Excellence champions				
<ul style="list-style-type: none"> Conduct a preparedness or rehearsal assessment to ensure the readiness for all personnel for any coming assessment 	Excellence champions				
<ul style="list-style-type: none"> Provide any information, documents, evidence, or requirements needed by the assessors during the assessment process, and Focus on including all achievements that add value to the assessment report 	Top management Implementation excellence teams Excellence champions				

Pre-Assessment Preparation

Post assessment and Feedback (Testing)

Activities may include	Responsibility	Time Frame		Observations
		Start	End	
<ul style="list-style-type: none"> • Circulate the assessment report to all concerned and implementation excellence teams within the organization, • Illustrate the strengths and clarify the areas for improvements and the details of the assessment report 	Excellence champions			
<ul style="list-style-type: none"> • Update the excellence team's implementation action plans based on the received assessment reports (internal or external) in order to raise the organization's excellence maturity level by utilizing the areas of improvements and to emphasize the strengths according to the report. 	Heads of Excellence Teams, Head of Departments			
<ul style="list-style-type: none"> • Promote benchmarking of areas of improvements with other similar organizations for converting them to strengths according to the identified best practices 	Excellence champions Implementation excellence teams			
<ul style="list-style-type: none"> • Re-establish the excellence teams 	Top Management			

- This step measures the effectiveness of the outcomes of the initiatives, ideas and solutions implemented in the previous steps, and
- Starts abovementioned steps again for the next assessment cycle.

based on the implementation outcomes, and					
<ul style="list-style-type: none"> Start the steps again 					

Post Assessment and Feedback

p. **Appendix (P) a comparison between Excellence models**

#	Criteria	Updated EFQM Model 2020	Malcolm Baldrige Model	UAE 4G Excellence Model	Design-thinking based BE Framework
1.	Criteria	Seven criteria grouped in three pillars, Direction Execution and results	Seven criteria Leadership, Strategy and HR are similar to EFQM	Nine criteria HR, and Asset and Resources are similar to EFQM	<p>Nine Criteria as EFQM & UAE BE Model</p> <ul style="list-style-type: none"> Leadership, strategy, HR, resources and assets are included as in other models. Difference exists in placing people at the centre rather than as a factor. Another difference is in placing attention on their knowledge, actions, and attitudes.
2.	Focus	More emphasis on the supportive processes and services	More emphasis on the supportive processes and services	More emphasis on the core processes and services of the public organizations	<ul style="list-style-type: none"> Highest emphasis is on the people of the organization.

					<ul style="list-style-type: none"> Channelizing their knowledge, attitudes, and actions demands the most attention. Internally, the phases of empathize, define, ideate, prototype, and test are suggested to focus energies on business excellence outcomes.
3.	Overall score	1000	1000	1000	To be determined as per application.
4.	Scoring weight	<ul style="list-style-type: none"> 200 for Direction 400 for Execution 400 for Results 	<ul style="list-style-type: none"> 45% for the results criterion, 12% for leadership criterion, 9% for integration criterion and 8.5% for each of the remaining four criteria, The higher weight reflects more importance 	<ul style="list-style-type: none"> Each criterion consists of capabilities part weighted 30% of the criterion weight, and Results part weighted 70% of the criterion weight, Weights of each criterion are dependent on the difference and privacy in the nature of the work of the government organization 	<ul style="list-style-type: none"> Scoring weights will also be determined as per the application in each organization. The scoring weights should flow from the core focus areas and critical success factors. It is suggested that scoring should follow the pattern of results 70%, capabilities 30% in line with the UK 4G Business Excellence model.

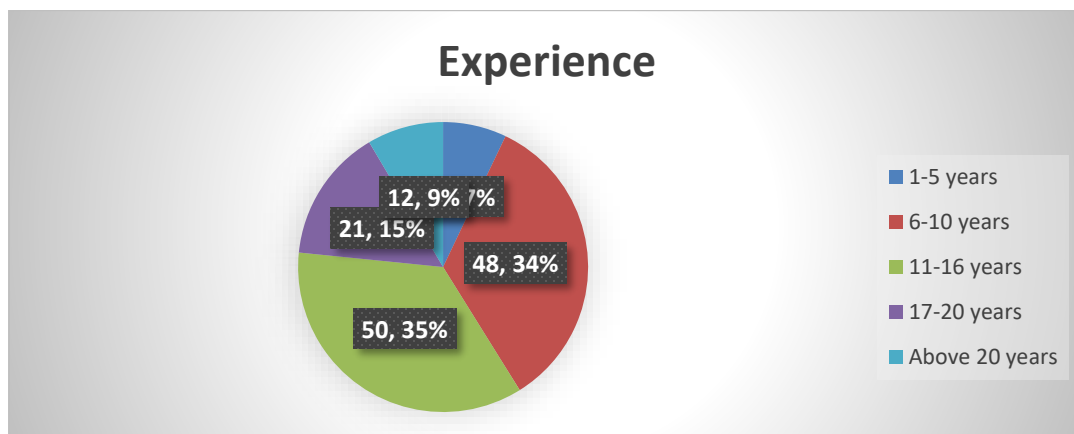
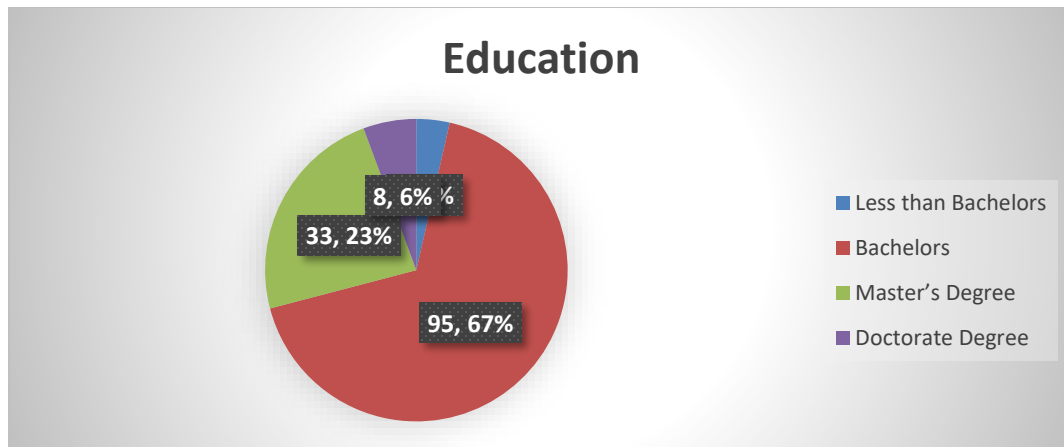
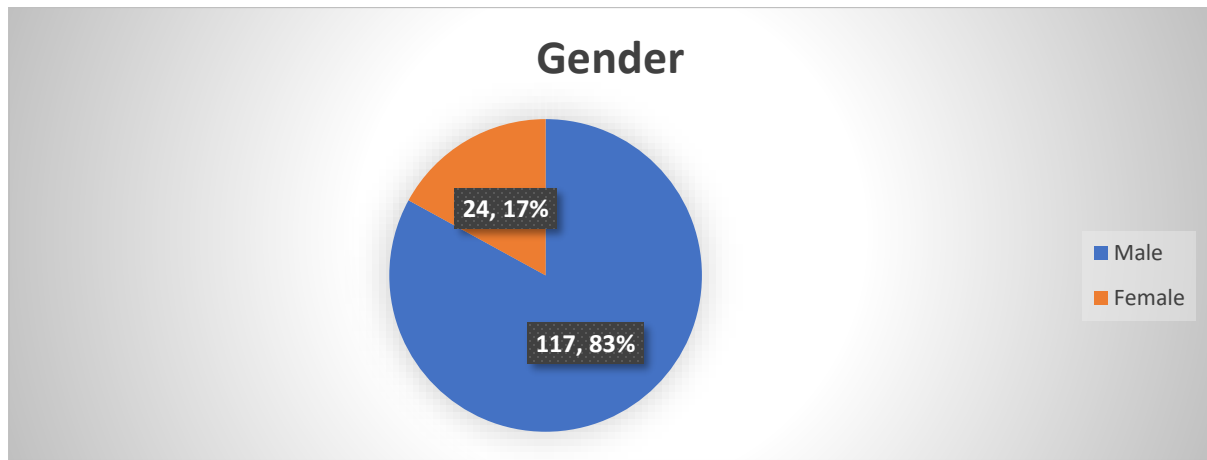
					<ul style="list-style-type: none"> The weights within results and capabilities should place a higher priority to human focus.
5.	Integration	<p>The role of integration is within the “organisational culture & leadership” criterion in Direction pillar</p>	<p>The integration criterion is the core of the model in addition to leadership criterion</p>	<p>The integration part is not clear</p>	<ul style="list-style-type: none"> Addressing the gap in the UAE 4G Business Excellence model, this model suggests that knowledge, attitudes, and actions of employees have to be integrated. Internal and external contexts have to be integrated. The five phases of design thinking have to be integrated. Therefore, three levels of integration are provided (figure 6.1) in this model. Further integration is left to the management and leadership to decide as per their organization’s

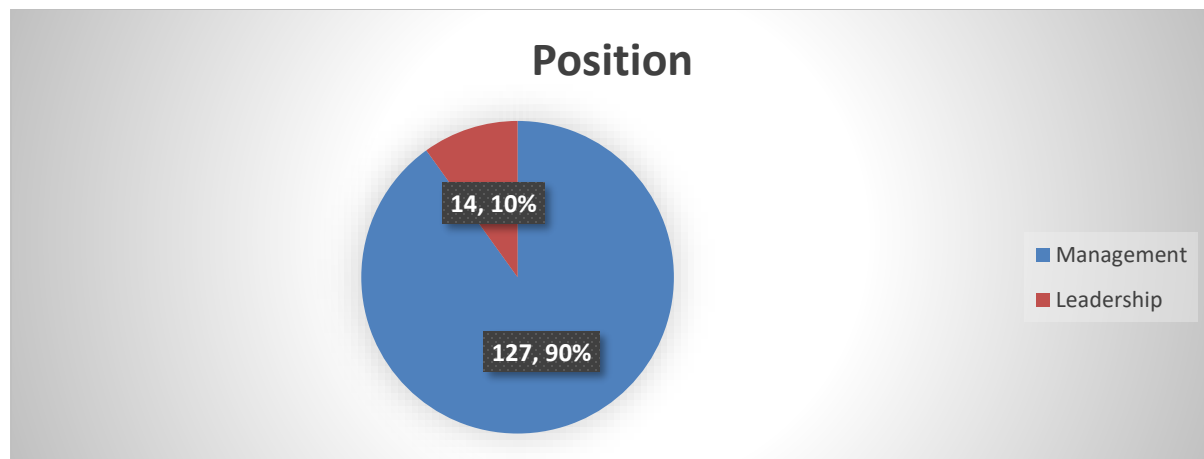
					needs and culture.
6.	Interdependency between criteria	The results criteria are enabled by the Direction and Execution criteria and the causality relationship is clear	The integration criterion serves as 'brain centre' for linking the operations with the strategic objectives	The interdependency between the criteria of the system is not clear	<ul style="list-style-type: none"> • Being a highly integrated model, interdependency in criteria is suggested to be kept high. • However, the linkages between design thinking and knowledge is not substantiated while with actions has been shown to be negative. • Further research is needed to make these linkages clearer.
7.	Corporate social responsibility	<p>Society Perception Results is part of "Stakeholders Perceptions criterion"</p> <p>With score of 200 for the perception results of all stakeholders:</p> <ul style="list-style-type: none"> • Customer • People • Business & Governing Stakeholders • Society 	Mentioned as one of the fundamentals of the model but not clearly included in the criteria	The social responsibility is part of the sustainability (economic, social and environmental), more applicable for the governmental organizations as it is not allowed to provide anything out of their scope of work	<ul style="list-style-type: none"> • Corporate social responsibility is not considered to be within the purview of the existing model. • It is, however, possible for leaders to choose to represent corporate social responsibility in their core attention areas and reflect on their success

		<ul style="list-style-type: none"> Partners & Suppliers 			<p>factors associated with them.</p> <ul style="list-style-type: none"> The human centred core of the model also lends support for the ability to volunteer and galvanize support for social causes.
8.	Purpose	Purpose is to promote competitiveness for European companies and manufacturers in the world market by adopting and implementing excellence concepts	Purpose is to promote competitiveness through Total Quality Management	Purpose is to consider the nature and specific type of the government apparatus and serve the strategic needs of the public sector	Purpose is to prescribe a model fit for the public sector organizations which allows them to implement business excellence in better guided and hence, clearer terms.
9.	Type of Organization	Private organizations without any relation with each other	Private and semi-private organizations without any relations with each other	Public with private partnership to perform combined national agenda or common government plan	Public sector organizations which wish to implement business excellence to become more responsive, agile, and successful.
10.	Assessment mechanism	RADAR logic for linking cause and effect through Direction and Execution versus results	Check lists for ensuring the implementation of the model requirements	Results and capabilities assessment	While it is kept for the leaders to decide according to the followed excellence model. It is recommended to include the RADAR logic as it is the most comprehensive in

					linking results with approaches.
11	The qualifications of the assessors	Excellence assessors who are EFQM certified without taking in consideration the nature of experience or academic qualifications	Excellence assessors who are trained in the requirements of the model criteria without taking in consideration the nature of experience or academic qualifications	Assessment teams of subject matter experts covering the core functions and the supportive processes	<ul style="list-style-type: none"> A cross-functional team of subject matter experts who understand the organization's context, operations, market, and its needs.
12	Designed by	European Foundation for Quality Management (EFQM)	National Institute of Standards and Technology NIST	It is designed by the UAE government to serve the public sector	The researcher based on the results of this study, the existing scholarly knowledge, and the accumulated wisdom of existing models of business excellence.

q. Appendix (Q) Demographic Variables.





r. Appendix (R) Common Method Bias table

Table: Harman's One Factor Test for Common method variance

Components	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% Of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	19.454	37.411	37.411	19.454	37.411	37.411
2	12.726	24.474	61.885			
3	2.717	5.225	67.110			
4	2.458	4.728	71.837			
5	2.075	3.990	75.828			
6	1.286	2.473	78.301			
7	1.060	2.038	80.339			
8	.864	1.662	82.001			
9	.795	1.530	83.530			
10	.689	1.325	84.855			
11	.508	.977	85.832			
12	.449	.864	86.696			
13	.416	.800	87.495			
14	.396	.761	88.256			
15	.392	.753	89.009			

16	.342	.657	89.666
17	.329	.632	90.298
18	.306	.588	90.886
19	.288	.553	91.439
20	.271	.522	91.961
21	.259	.498	92.459
22	.254	.488	92.947
23	.242	.465	93.413
24	.236	.454	93.866
25	.223	.429	94.296
26	.204	.392	94.688
27	.199	.383	95.071
28	.185	.356	95.427
29	.179	.345	95.772
30	.176	.339	96.110
31	.154	.295	96.406
32	.147	.283	96.689
33	.144	.278	96.966
34	.131	.252	97.218
35	.127	.245	97.462
36	.124	.239	97.702
37	.120	.230	97.932
38	.115	.221	98.153
39	.105	.202	98.354
40	.097	.186	98.541
41	.093	.180	98.720
42	.091	.174	98.894
43	.083	.160	99.054
44	.076	.145	99.200
45	.070	.134	99.334
46	.067	.129	99.463

47	.057	.111	99.574
48	.052	.100	99.674
49	.052	.100	99.774
50	.046	.088	99.862
51	.041	.078	99.940
52	.031	.060	100.000
