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**Drivers and performance outcomes of effective use
of business intelligence (BI) system for managing
customer relationships**

A multiple case study in business-to-business sector

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ABSTRACT:

The era of big data has heralded and ushered in a new way of doing business and new waves of business activities. The increasing amount of data has called for new ways of managing customer relationships according to customer needs and preferences in order to increase customer value and satisfaction. These days, customers are better positioned to make informed decisions due to the huge amount of information readily available on the internet and other platforms. Staying ahead of the competition requires taking proactive actions and making strategic and well-informed decisions through insights gained from customer data. This can be facilitated through use of business intelligence (BI) system. While the impact of the use of BI system on firm performance has received relatively little attention, the factors that drive the effective use of BI system for managing customer relationship have received no attention. This is a first of its kind study to investigate the drivers of the effective use of BI system at two levels. Drawing on the theory of effective use and the business process performance framework, this study develops a theoretical framework on the determinants and performance outcomes of the effective use of BI system for managing customer relationships. Data was collected from 4 different companies (2 MNEs and 2 SMEs) using a multiple case study methodology. The findings reveal that organizational level determinants such as top management support and commitment, well defined goals and vision, organizational culture, BI capabilities and training drive the effective use of BI system in managing customer relationships. At the user level, the findings reveal that employee commitment, soft skills, self-efficacy drive the effective use of BI system for managing customer relationships. Further, effectively using the BI system leads to increased sales, enhanced product innovation, reduced cost, improved customer relationship, increased learning, and improved decision making. This study contributes to the understanding of how businesses can effectively use the BI system to improve business process performance in order to attain their business goals.

KEYWORDS: Business Intelligence System, Customer Relationship Management, Drivers, Performance Outcomes, Effective Use

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Abbreviations

ABB: ASEA Brown Boveri

BI: Business Intelligence

BSC: Balanced Score Card

B2B: Business-to-Business

CM: Customer Management

CRM: Customer Relationship Management

CS: Customer Strategy

CSF: Critical Success Factor

DCV: Dynamic Capability View

DSS: Decision Support Systems

D&M: DeLone and McLean

ERP: Enterprise Resource Planning

EU: European Union

GDPR: General Data Protection Regulation

IS: Information System

IT: Information Technology

KPI: Key Performance Indicators

MNE: Multinational Enterprises

MSS: Management Support System

OLAP: Online Analytical Processing

RsO: Research Sub-objectives

RBV: Resource-Based View

RM: Relationship Marketing

SME: Small and Medium-sized Enterprises

1 INTRODUCTION

1.1 Background of the study

Customers are the most valuable assets of a company (Peppers & Rogers, 2004: 3). Consequently, it is important for companies to develop means through which these valuable assets can be effectively managed so as to derive adequate value from it. To put it simple, customers form the focal point of any business; therefore, businesses exist because of the relationships between companies and their respective customers. The concept of Customer Relationship Management (CRM) date back to the 1980s (Cambra-Fierro, Centeno, Olavarria & Vazquez-Carrasco, 2017). However, the term CRM began to grow and gain more attention from academics and business leaders in the 1990s (Williams 2014; Cambra-Fierro, Centeno, Olavarria & Vazquez-Carrasco, 2017; Farhan, Abed, & Ellatif, 2018). This was as a result of the paradigm shift towards customer-centred relationships. From the 1990s, Customer Strategy (CS) or Relationship Marketing (RM) or Customer Management (CM) became the new focus of customer relationships as companies began to shift from traditional marketing, which was more of transactional, to building lasting relationships with customers due to the increased level of competition in the markets. This was made possible due to the development and advancement in new technology (Payne, 2005: 5; Williams, 2014: 4). Business practitioners became more aware of the need to maximise customer relationships in order to gain competitive advantage.

Companies are realising that there is a need to do more not just to acquire customers, but to retain customers. Higher retention rate means more revenue for the company. The cost of acquiring new customers keeps increasing. Hence, the need to build a one-to-one relationship with the customer is beginning to take the centre stage in corporate strategies. In recent times, it is much easier to lose a customer than to gain a new one. It is six times more expensive to sell to a new customer than to an existing customer (Dyché, 2002). Although the cost of acquiring a new customer may vary from industry to

industry depending on the situation, it is mostly believed that acquiring a new customer costs more, say six times.

As mentioned earlier, the shift from traditional marketing gained momentum in the 1990s. Before then, in the 1950s, the framework for marketing was centred on the “4Ps”, that is, the marketing mix — Product, Place, Price, Promotion. The marketing strategy was to maximize sales and increase market share (Peppers & Rogers, 2004: 9; Payne, 2005: 7). Companies were much more focused on reaching more customers than building a relationship with a customer. However, as markets begin to expand and technology begin to advance, customers begin to have a choice, and invariably define how they want to be served.

Companies, nowadays, focus more on increasing their relationship with existing customers, that is, winning customer share (Kotler, 2004). There is a continuous drive to not only get customers alone, but to keep and grow them. These customer strategies include “Get”, “Keep”, and “Grow” by Peppers and Rogers (2004: 5). Get means acquiring profitable customers. Keep signifies retaining, winning back and eliminating unprofitable customers. Grow connotes upselling of “additional products in a solution” (Peppers & Rogers, 2004: 5), cross-selling of “other products to customers” (Peppers & Rogers, 2004: 5), referral (Peppers & Rogers 2004: 5), and reducing “service and additional costs” (Peppers & Rogers, 2004: 5).

The discussion around CRM today is not complete without the mention of data and the important role it plays in relationship marketing. Any information stored is data, which can be in the form of observations, facts, anecdotes, opinions, and can also be numbers and alphanumeric (Maheshwari, 2014: 6). Since the advent of the internet, and subsequent technological advancements, information technology (IT) is believed to have been playing a major role in helping businesses store, retrieve and analyse data about their respective customers. Companies now maintain databases of their customers which can be used by their employees for marketing purposes. Because of the internet, customers are much closer to companies than before. Moreover, it is now possible for companies

to learn more about the needs of their customers and offer them services that are tailored towards meeting the individual needs of their customers (Kotler, 2004: 12). Consequently, the interaction between businesses and the customer is improved.

Digitalization has had a great effect on the ways brands communicate with their customers. The digitization process has increased the amount of data at the disposal of every organisation. As everything is being digitised, the processing of data becomes faster and easier, and more importantly, it increases efficiency. Furthermore, the use of social media and other digital platforms has increased the amount of data companies deal with daily. These platforms have made it possible for businesses to better understand their customers. They can see what they do, know their preferences, and understand what motivates them. At the centre of all of these is the idea to improve customer value. The customer value can be improved by making informed decisions through insights gained from customer data. One of the tools or systems that can help businesses make informed decisions towards improving their business operations by analysing data is a Business Intelligence (BI) system.

The concept of Business Intelligence (BI) is far becoming an important concept for practitioners and researchers due to the fact that we are in the era of 'big data' (Shollo & Kautz, 2010; Agarwal & Dhar, 2014). It is practically impossible, nowadays, to browse the internet without coming across words or phrases like data, big data, huge data, data analysis, or data management to mention but a few. Thus, companies are actively looking for ways to meet this challenge.

To lay the broad foundation for this topic, it is necessary to evaluate the importance of Business Intelligence (BI) systems in business strategy and what BI actually stands for. As mentioned earlier, managing customer relationships is a huge part of the business strategy. Without an effective CRM plan, it is probably impossible for businesses to maximise the value of customer relationships. And that being the case, profitability is affected. It is important to stress that companies are employing the use of BI systems to make decisions in many business areas in order to create value (Trieu, 2017). This is due to the fact that BI systems make it possible for businesses to analyse huge data stemming from the

interaction with the customers. As data begin to increase, companies are beginning to embrace BI systems to manage huge data.

In business, taking a quality decision involves going through different steps in the decision-making process. In this regard, Business Intelligence ensures that a quality decision is taken (Gupta & Sharma, 2013). It is further argued by Elbashir, Collier and Davern (2008) that management decision is supported and improved by BI systems through an analysis of business information in various business functions. The use of BI systems is gaining momentum, especially in big companies and other companies that can afford it. As a decision support system (DSS) and also one of the management support systems (MSS) tools, BI systems are designed to help the decision-maker make an informed decision while reducing uncertainty (Clark, Jones and Armstrong, 2007).

Businesses are more concerned about making informed decisions and taking calculated risks based on facts and insights (Maheshwari, 2014: 23). According to Maheshwari (2014: 23), decisions are of two types: strategic and operational. While a strategic decision impact the direction of a business, an operational decision is more of routine and tactical (Maheshwari, 2014: 23). Business Intelligence can be useful in both ways.

One of the corporate strategies of a business is to analyse its internal and external environments. A BI system includes tools that help managers run their businesses effectively and efficiently while taking into consideration the internal and external environments. These are data warehousing, online analytical processing (OLAP), reporting, querying, social media analytics, data mining, and dashboards (Maheshwari, 2014: 24). It is necessary to mention that a spreadsheet is also a BI tool with less features. However, as it has been mentioned earlier in this paper, this study is focused on a BI system with more advanced features.

Since it first emerged in the 1980s, CRM has been studied extensively. The concept of CRM has received attention from different researchers. In other words, the concept has been defined as a process; a strategy; a philosophy; a capacity, as well as a technological tool (Zablah, Bellenger & Johnston, 2004). Hence, there is no universal definition for it.

However, considering the different perspectives in the context of philosophy, process, strategy, capacity, and technology, the bedrock of CRM still revolves around managing profitable long-term relationships (Cambra-Fierro et al., 2017).

Drawing inspiration from the work done by Trieu (2017), which reviewed 106 relevant studies on BI between January 2000 to August 2015, it was observed that the use of BI systems has a correlation with its impacts on the organisation. On the one hand, Trieu (2017) observes that an effective use of BI system impacts on the organisation positively. The impact on company's performance can be significant (Hawking & Sellitto, 2010). On the effective use of BI, Dinter (2013) argues that the BI system quality as well as adequate information supply are necessary. In the same vein, Li, Po-An Hsieh, and A. Rai (2013) claim that intrinsic and extrinsic motivations influence the effective use of BI when used routinely and innovatively.

On the other hand, Deng and Chi (2012) assert that when a BI system is not used effectively, there is a negative impact on business task performance due to workflow problems. The deduction from these claims on BI use process is that the effective and ineffective use of BI system has an impact on organizational performance say positively or negatively.

In the light of this, Trieu (2017) posits that although there might have been research on the use of BI system in the past, there has been a handful of empirical studies on it. This argument is supported by Burton-Jones and Grange (2013). It is further argued that most of the research done in this field have been on BI impacts and BI assets while latency effects have not been studied fully (Trieu, 2017). Hence, this claim will form the basis for this study.

Latency in BI use process can be described as a form of delay that occurs in the required time for adaptation, implementation, and acceptance (Santhanam & Hartono 2003). Latency can affect decision-making in the use of BI system and other business processes

(Trieu, 2017). The three kinds of latency that have effects in the BI use process are data latency, analysis latency, and decision latency (Watson, Wixom, Hoffer, Anderson-Lehman & Reynolds, 2006)

The importance of this topic can be seen from the increasing amount of data in businesses, that is, the era of 'big data', and as a result, managers are finding ways to effectively manage the huge amount of data available which can be used in the decision-making process towards building a long-lasting relationships with their customers. As mentioned earlier, it is important to have an effective CRM plan in order to maximise the value of managing customer relationships. It is necessary to state that CRM in this context is about the company's business practices that puts the customer at the centre of their business strategy in order to build long-lasting relationships with their customers (Dyché, 2002: 18; Peppers & Rogers, 2004: 6).

Furthermore, it is important to have studies on the effective use of BI system in order to get more understanding on how businesses can maximise the business value of BI as this area of study has not been well covered (Trieu, 2017). BI investment is a big investment; hence it is important for businesses to understand the ways of effectively using the technology in order to derive maximum value from the investments. In addition, there has been less research work on the strategic performance impact of BI system adoption (Elbashir et al., 2008).

To further lay emphasis on the importance of this topic, it is necessary to state that since businesses are expected to monitor their performances in order to increase shareholder value, the effective use of BI system can help organizations track some key performance indicators (Maheshwari, 2014) in order to attain business goals. Hence, more studies on the effective use of BI is required.

Though there has been relatively many studies on BI impacts and BI assets, a review of the existing research in the BI literature have shown that there is no prior study in this

research area regarding the drivers of effective use of BI system for customer relationships. Moreover, the effective use of BI system for CRM has not received attention. Thus, this study will exploit the existing research gap in this domain. This will help firms to understand how to use BI systems effectively to improve organisational performance and business value. It is also important to state that the impact or role of BI systems on firm performance in terms of outcomes has not received much attention. Consequently, this study will exploit the research gap in the context of managing business-to-business (B2B) relationships, which will be helpful to firms to better understand the impact of this technology on sales and other key result areas.

1.2 Research question and objectives of the study

As businesses are continually focused on monitoring their business environment and their performance in the markets using an information system, coupled with the increasing amount of data (big data) available at various levels of the organization, stemming from the interactions with their respective customers and customers' activities online, it becomes imperative to investigate what factors drive the effective usage of BI system for building long-lasting relationships with the customers. Since customers are the most valuable assets in a company, the effective usage of BI system for the purpose of managing customers relationships to maximise customer value is important. The appropriate performance outcomes stemmed from the effective use of a BI system will set a company above its competitors.

The **objective of this research paper is to investigate the drivers and performance outcomes of the effective use of BI system for managing customer relationships**. To achieve this, it is necessary to investigate the role of BI system in managing long-term relationships. Firms, especially the bigger ones that can afford huge investments in IT systems, use CRM software packages in managing customer relationships. However, it will be necessary to investigate how businesses can effectively use BI systems in managing relationships with their customers so as to reap the benefits of using this technology.

Due to its enhanced analytical capabilities, BI systems are increasingly being adopted to replace other existing Enterprise Resource Planning (ERP) systems that have been installed to manage a vast stock of data (Elbashir et al., 2008). In spite of the investments, it has been observed that many companies have reaped benefits from the use of BI system (Audzeyeva & Hudson, 2016). This might have been as a result of the wrong implementation of the BI system or perhaps ineffective use of the IT system. When a technology is not effectively deployed as it was designed to be deployed, the effects will be seen in the impacts on firm performance. In the light of this, it is pertinent to investigate how this can be avoided by firms and as a result, the following research question has been formulated:

“What are the drivers and performance outcomes of effective use of BI system for managing customer relationships?”

In order to have a guide and a clear direction for this study, it is important to set the research sub-objectives. The sub-objectives are based on the objective of this study. These sub-objectives will provide the necessary guidance for the research and help the researcher in finding the right answers for the research question. Moreover, the sub-objectives will provide clarity for the reader as regards the direction and aim of the study. Hence, the following research sub-objectives (RsO) have been defined for this research paper:

- 1. To increase understanding about the conceptualization and role of CRM, types of BI systems for CRM, their implementation process, and benefits of effective usage.*
- 2. To explore the determinants of effective use of BI system at both organizational and user levels.*
- 3. To increase understanding about conceptualization and measurement of firm performance.*

4. *To investigate the impact of effective use of BI system on firm performance.*

1.3 Delimitations of the study

Due to the geographical location of the researcher, the researcher has decided to delimit this study to selected firms within Finland, especially in the Vaasa region: two large multinational Enterprises (MNEs) and two Small and Medium-sized Enterprises (SMEs) that are international. This is necessary to understand the level of investments in BI systems by these firms and how these two categories of firms deploy the use of these IT systems for effectively managing customer relationships from the perspective of B2B relationships as well as the impacts on firm performance in terms of sales, product innovation, cost, relationship improvement, learning, and decision-making. In addition, the researcher decided to focus on firms in the same industry (energy sector) that have been using the BI system for more than one year in order to properly examine the impacts on firm performance.

The theoretical part of this study consists of six approaches. The first part focuses on the definition and role of CRM. This will provide the reader with an overview of the concept of CRM in the context of the company's business practices that put customers at the centre of their business strategy. Thus, CRM in the context of a technology tool is considered. This is to avoid any confusion as regards using one IT system for another.

The second part focuses on the types of BI systems for CRM. For the purpose of this study, this part considers the BI systems responsible for managing customer relationships. This is then narrowed down to BI systems that tackle sales, production/product innovation and cost reduction. The idea is to give a sense of clarity to the reader as to the direction of the research. Other systems that do not fall under this category are not considered.

The third part considers the implementation process and benefits of effective usage of BI systems for CRM. In other words, in this part, the focus is on the implementation process of BI system. Then, the benefits of effective use of BI systems for CRM are explained. Other Decision Support Systems (DSS) that are not related to the BI system are not considered.

The fourth part on the determinants of the effective usage of BI system. The determinants will be considered at two levels: organizational and user level. This is because the effective usage of the BI system depends solely on some factors, which are considered at the two levels. However, the study does not include any irrelevant factor that can undermine the objective of this study.

The fifth part focuses on the conceptualization and measurement of firm performance. This is achieved through a review of previous research on this area. On this part, the study has been delimited to studies within the last four decades for the sake of relevance.

The final part examines the impact of effective usage of BI system on firm performance. Some theories relating to the impact of BI system on firm performance such as resource-based view (RBV), IS success model, theory of effective use, and dynamic capabilities are discussed. Other theories such as DeLone & McLean IS success model, Technology acceptance model, and Diffusion of innovation theory are not considered as these theories have been overutilized (Ain, Vaia, DeLone & Waheed, 2019). Moreover, on the impact on firm performance, the study is delimited to sales, product innovation, cost, relationship improvement, learning, and decision-making to achieve the purpose of the study.

To conclude, the sample of four companies for data collection was chosen due to time constraints and to have an in-depth discussion with the respondents. Thus, the generalization of the findings may be limited.

1.4 Definition of key terms

The key terms in this thesis are customer relationship management, business intelligence, drivers, performance outcomes, and BI effective usage.

- **Customer relationship management** is a business strategy that involves carefully targeting the right kind of customers and building a relationship with each customer with the sole aim of maximising shareholder value and increasing profitability (Zablah et al., 2004; Payne, 2005).
- **Business intelligence** can be defined as “the systematic collection and preparation of data to provide management, employees, and other stakeholders with meaningful information that, combined with context-rich knowledge of the organization, improves the effectiveness of the organization’s strategy process” (Brijs, 2013).
- **Drivers** can be defined as factors that cause an individual or an entity to respond in a certain way. A driver influences the behaviour or action of an individual or a thing to act in a certain way.
- **Performance outcomes** are measured in terms of sales, product innovation, cost, relationship with customers, learning, and decision making.
- **BI effective use** can be described as the use of the BI system in a way that produces the desired results.

1.5 Previous studies

The table 1 below presents a brief summary of the most relevant prior studies on this current field of study.

Table 1 Prior studies related to the drivers and performance outcomes of the effective use of BI systems for managing customer relationships.

Author(s) / Year	Studies on the determinants of effective usage of BI System			
	Focus of the study	The-ory/Model/Frame-work	Methodology	Findings of the study
Antoniadis et al. (2015)	<ul style="list-style-type: none"> - To study the factors affecting the adoption and usage of BI systems - Classification : Organizational and operational 	Not specified	Qualitative (Interview of managers from 37 different firms)	Organizational and operational factors like culture, strategy, leadership, learning and quality management affect the implementation and integration of BI system.

Sparks & McCann (2015)	- To examine the factors that contribute to the use of information from a BI system in management decision making and examine its relationship to organizational performance	Huber's (1990) theory	Quantitative (Survey of 259 managers)	Factors such as analytical decision-making culture information content quality, and information access quality contributed to information usage.
Studies on the impact of BI system on firm performance				
Ahonen (2017)	- To study the role of business intelligence systems in supporting decision making process in organizations	Not available	Quantitative (Survey of employees of 37 firms)	- Improves operational efficiency - BI system enhances better decision making - Used as sales tool
Pääkkönen (2015)	- To study the use of business intelligence for internalization and organization learning	Internationalization process model, organizational learning	Qualitative (Interview of managers of 4 different Finnish companies)	- BI system facilitates internationalization - BI system facilitates organizational learning
Aydiner et al. (2019)	- To investigate IS capabilities and their effects on firm performance	Resource based view	Quantitative (Survey of 204 medium to high	- IS human resource capability and IS administrative capability improve financial performance of the firm

			level business executives in different industries)	
Torres et al. (2018)	- To examine the role of BI&A in organizations	Dynamic capabilities	Quantitative (A survey of 137 business professionals)	- BI system facilitates improved firm performance
Hou (2016)	- To examine the impact of BI system use on organizational performance.	The balanced scorecard	Quantitative (A survey of business professionals from 139 Taiwan's semiconductor industry)	- BI system improves internal process, customer performance and learning and growth

1.6 Structure of the thesis

The structure of the thesis goes thus: chapter 1 comprises the background and the justification of the study. Chapter 2 includes the theoretical framework of the study. The theoretical part of this study consists of six approaches. The first part focuses on the definition and role of CRM. The second part contains types of BI systems for CRM. The third part considers the implementation process and benefits of effective usage of BI systems for CRM using different theories, models, and frameworks to explain the implementation process of IT systems. The fourth part focuses on the determinants of the effective usage of BI system — organizational and user level. The conceptualization and measurement of firm performance is discussed in the fifth part, while the impact of the effective usage of BI system on firm performance is examined in the final part using different theories. Chapter 3 contains the methodology of the study, where the research approach and design are discussed. Chapter 4 includes the research findings and discussion. Chapter 5, which is the last part, contains the summary and conclusions of the study. Figure 1 shows the structure of this thesis.

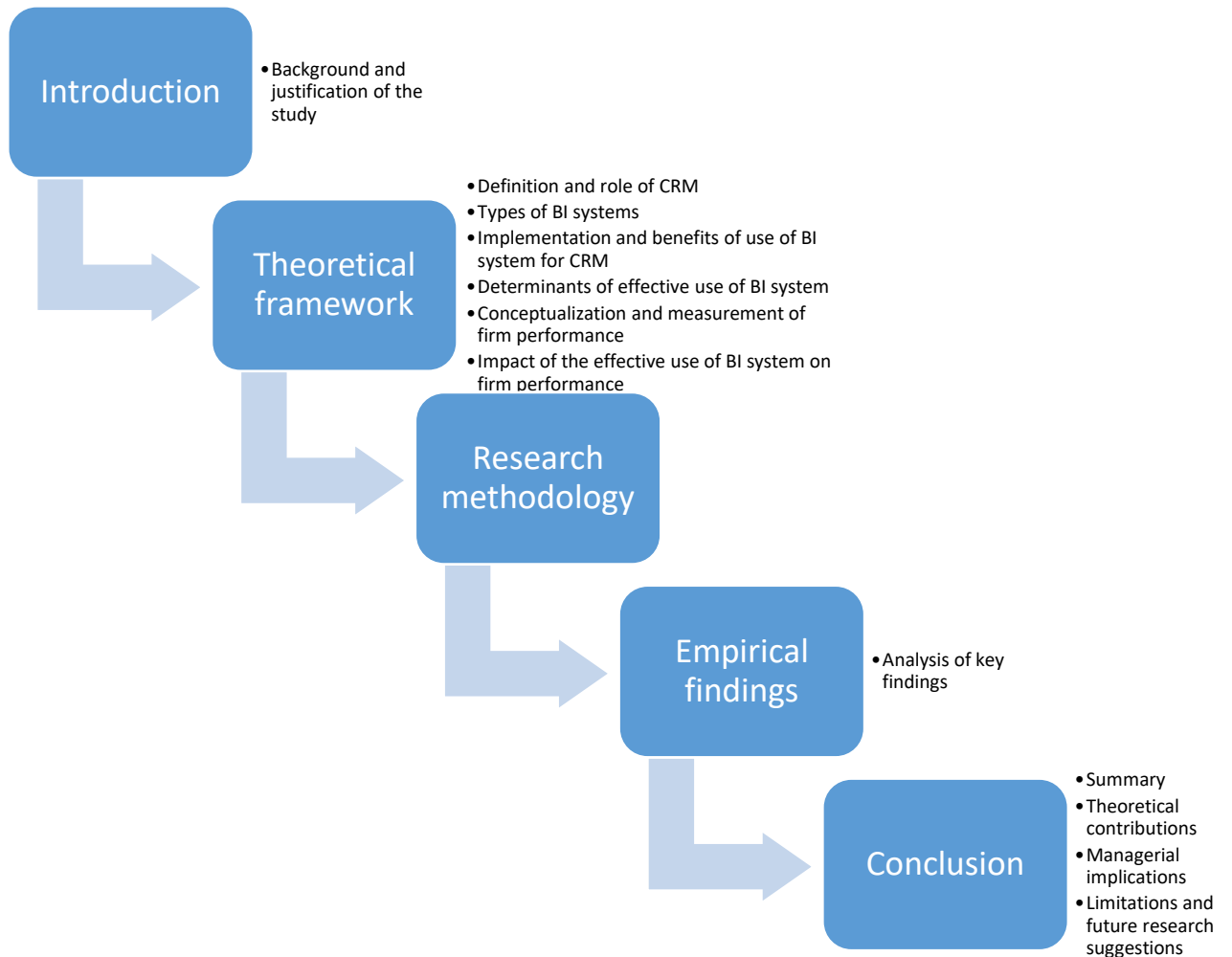


Figure 1 Structure of the thesis

2 LITERATURE REVIEW

2.1 Definition and role of CRM

As previously mentioned, this part on CRM will examine some of the relevant definitions in CRM as there is no universally acceptable definition of CRM. This will be followed by a more relevant definition that will provide a solid background for the study. Specifically, this part will consider all the different perspectives of CRM in various fields in order to give the reader an overall understanding of how the concept has evolved over the years.

Zablah et al. (2004) categorise CRM into 5 different perspectives: a process; a strategy; a philosophy; a capacity, as well as a technological tool. As a process, CRM is regarded as a relationship between the buyer and the seller, which develops or evolves over time (Zablah et al., 2004). The buyer-seller relationship will develop over time as a result of commitment as well as if firms understand the needs and expectations of their customers. To remain competitive in the market, firms must devise means of satisfying their customers in a better way than the competitors (Cambra-Fierro et al., 2017).

In the same vein, CRM as a philosophy emphasises building and maintaining long term relationships with the customers (Zablah et al., 2004). The focal point of this perspective is customer loyalty. In achieving this, this perspective suggests that firms must continuously be focused on improving customer value (customer-centric), which must be enshrined in the culture of the firm and thus, lead to CRM success (Zablah et al., 2004).

CRM as a capability recognises the need for firms to develop the capacity to manage their resources, which will enable them to meet the demands of their customers (Zablah et al., 2004). This perspective focuses more on the internal resources of the firm and how they can be deployed in order to satisfy their customers in the best way. Cambra-Fierro et al. (2017) posit that this perspective can be linked to the Resource-Based View, which emphasises the need for a firm to exploit own resources and capabilities in order to achieve a competitive advantage. Thus, the success of CRM is determined by

possessing the right set of resources — tangible and intangible — which will help in meeting the needs of the individual customers (Zablah et al., 2004).

Similarly, the technology perspective is about the use of technological tools to access and manage customer data for the purpose of managing and building long term relationships with the customers. In addition, it is a “technology product, often in the cloud, that teams use to record, report and analyse interactions between the company and users” (Salesforce.com). Specifically, the technological tools allow firms to link various functions within the organisation in order to manage interactions between the various platforms (Zablah et al., 2004). Obviously, this perspective can be likened to the capability perspective, which is linked to the Resource-based View. Consequently, the success of CRM is determined by the quality and effective use of the technological tools deployed by the firms to manage interactions across various functions (Zablah et al., 2004).

CRM as a strategy is more concerned with the need to allocate resources into building and maintaining relationships with customers based on their lifetime value to the company (Zablah et al., 2004; Cambra-Fierro et al., 2017). As put forward by Payne (2005), the aim of CRM is to acquire, maintain and retain profitable customers. This perspective focuses more on the value of the customer to the company since it is believed that not all relationships are valuable. While it is necessary to build and maintain relationships with the customers, this perspective emphasises the need to build and maintain the “right type of relationships” that will improve the profitability of the company (Zablah et al., 2004). Hence, the success of CRM depends on the ability of the firm to build and maintain relationships with profitable customers over a long period of time (Zablah et al., 2004).

Considering the foregoing analysis of the different perspectives of CRM, it is noteworthy to state that the strategic perspective gives a clearer understanding of what CRM intends to achieve (Zablah et al., 2004). This is not in any way intended to demean other perspectives in the CRM process. Strategically, it is about carefully targeting the right kind

of customers and building a relationship with each customer with the sole aim of maximising shareholder value and increasing profitability (Zablah et al., 2004; Payne, 2005). CRM, in this context, is about the business practices that put the customer (customer-centric) at the centre of the business strategy. As pointed out by Farhan et al. (2018), CRM is a “customer-oriented business strategy” that is focused on improving customer satisfaction and loyalty through the provision of personalised services. Although this definition does not include the value of the customer relationship to the firm, it corroborates the idea of treating each customer differently. Peppers and Rogers (2004: 6) describe CRM as an “enterprisewide business strategy ” which involves treating each customer differently. In spite of the different CRM perspectives, the bedrock of CRM still revolves around managing profitable long-term relationships (Cambra-Fierro et al., 2017). In strategic terms, it is important for organisations to understand what CRM stands for and how this can be adopted by everyone in the organisations (Payne, 2005).

2.2 Types of BI system for managing customer relationships

BI systems are used as decision support systems in organisations. As Trieu (2017) pointed out, many firms now make use of BI systems to make decisions that create value in the organisation. It is necessary to understand that getting value from a BI system is contingent on the effective use of the BI system (Burton-Jones and Grange, 2013). For the purpose of clarity, Elbashir et al. (2008) define BI systems as “specialised tools for data analysis, query, and reporting, (e.g. OLAP and dashboards) that support organizational decision-making that potentially enhances the performance of a range of business processes”. BI systems help businesses to analyse huge data in order to aid decision-making at various levels of the organisations. These systems can be deployed in any industry.

Since there are no known research studies on BI system for managing customer relationships in past and recent literature, this paper will adopt the classification of BI systems by Arnott, Lizama & Song (2017) because this classification gives a better understanding of the functions of BI system as used in an organization. According to the authors, the

two main types of BI systems are the enterprise BI and the functional BI. The enterprise BI is a complex BI system, which is managed by the IT department to provide support for managers across different divisions in the organization. As the name suggests, it is an enterprise-wide system for managers and decision makers in the organisation. The users of this BI system are spread across various functions in the organisation i.e. it is not restricted to one particular function within the organisation and the BI system data is available for the overall interest of the organisation. The other BI system, according to Arnott et al., (2017), is the functional BI. This BI system is deployed to one unit in the organisation and the unit is solely responsible for its management and data. Apparently, the enterprise BI system is the system most vendors, experts and academics refer to when talking about BI (Arnott et al., 2017). The most common types of Business intelligence tools provided by vendors include Microsoft Power BI, Tableau, SAP business intelligence, SAS Business Intelligence, Oracle BI, Salesforce Einstein, Sisense, MicroStrategy, QlikView and QlikSense, and Yellowfin. Also, it is necessary to mention that Excel (Spreadsheet) is regarded as a business intelligence tool as it helps to make data meaningful (Gupta & Sharma, 2013).

2.3 Implementation process and benefits of effective use of BI systems for CRM

Over the years, there has been studies on the adoption, implementation and the effective utilization of Information Systems (IS) in an organization. In order to avoid ambiguity, IS are systems designed for collecting, storing, processing, and analysing data to aid decision making in an organisation. When these systems are successfully implemented, the ripple effect is huge for the organisation. Thus, this section will consider the implementation as well as the benefits of the effective utilization of BI systems for managing customer relationships.

2.3.1 Implementation process

Many papers have discussed the implementation process of BI systems from different angles which include models, critical success factors (CSFs) frameworks, success frameworks, and lifecycles. This study will consider the implementation process of a BI system including the CSFs as well as the CSFs of CRM.

To begin with, it is necessary to consider the Information Technology (IT) implementation process model proposed by Cooper and Zmud (1990). IT implementation is regarded “as an organizational effort directed toward diffusing appropriate information technology within a user community” (Cooper and Zmud, 1990). Diffusion of technology, proposed by Rogers (1962), is an argument on the spread of the technology. Based on the IT implementation stage model by Kwon and Zmud (1987), Cooper and Zmud (1990) proposed an IT implementation process model as indicated below in figure 2.

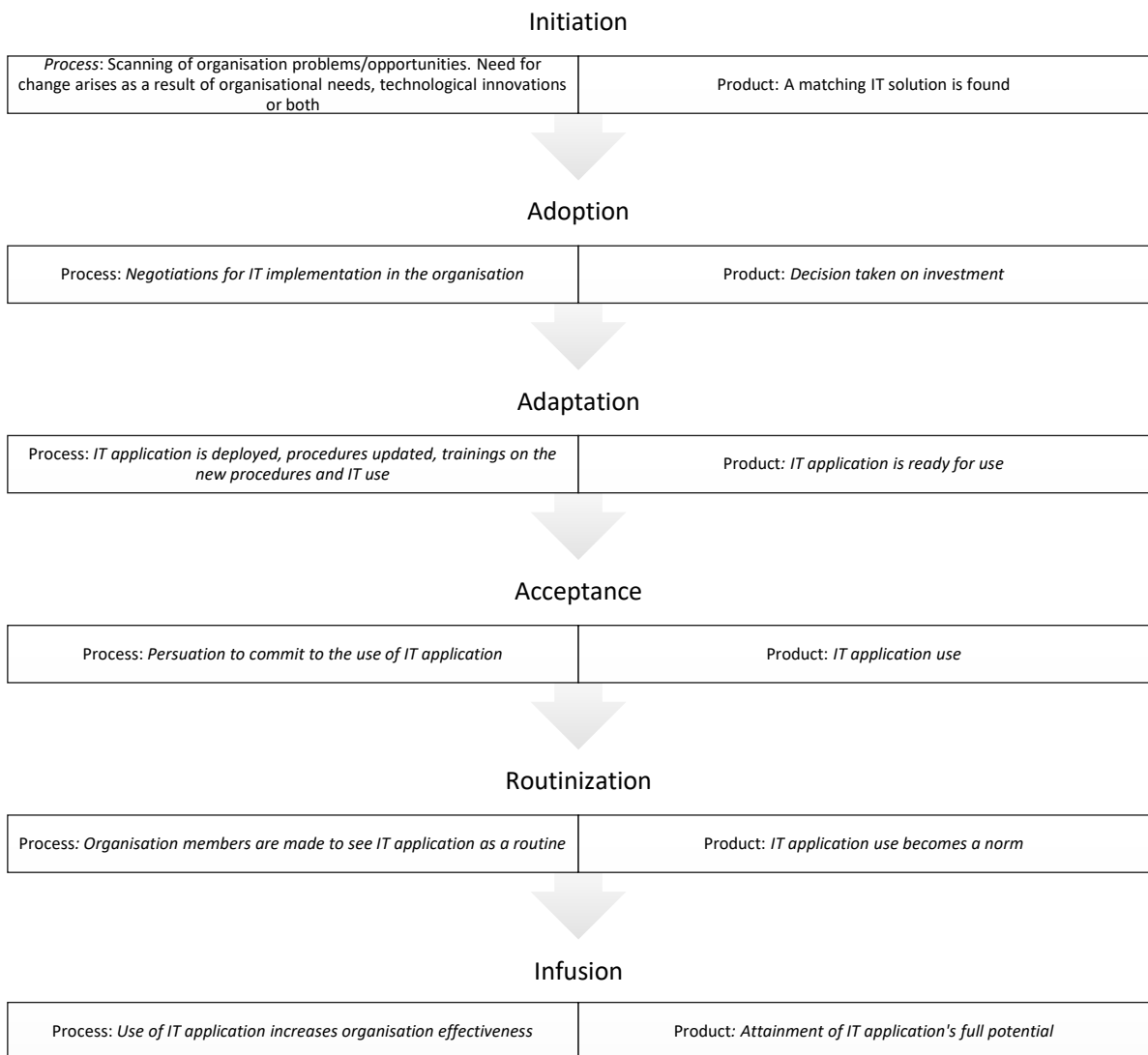


Figure 2. IT implementation process model (Cooper and Zmud, 1990)

In their study, the authors concluded that managing and understanding the IT implementation process is important so as to derive value from their investments. A systematic review of the implementation process must be carried out at every stage to detect and address any issues that may arise (Cooper and Zmud, 1990).

While it is important to manage and understand the IT implementation process in order to derive value from it, the success of the IS in terms of getting the desired outcome is actually not guaranteed. This leads us to the initial IS Success Model by DeLone and McLean (1992). In their research, DeLone and McLean identified six categories of IS

success, which include “system quality, information quality, use, user satisfaction, individual impact, and organizational impact”. Basically, the IS success model is a process model, which was developed following the literature of organisational effectiveness. It is important to state that the six categories are interdependent constructs. The model, in a nutshell, suggests that the “system quality” (characteristics/features) and “Information system”(product) have an effect on “use” and “user satisfaction” which are both dependent on each other. Then, this leads to “individual impact” which eventually determines “organizational impact”. In other words, the model is composed of three parts, which include i) the system creation, ii) use, and iii) impact (DeLone & McLean, 2003). This model is presented in figure 3 below.

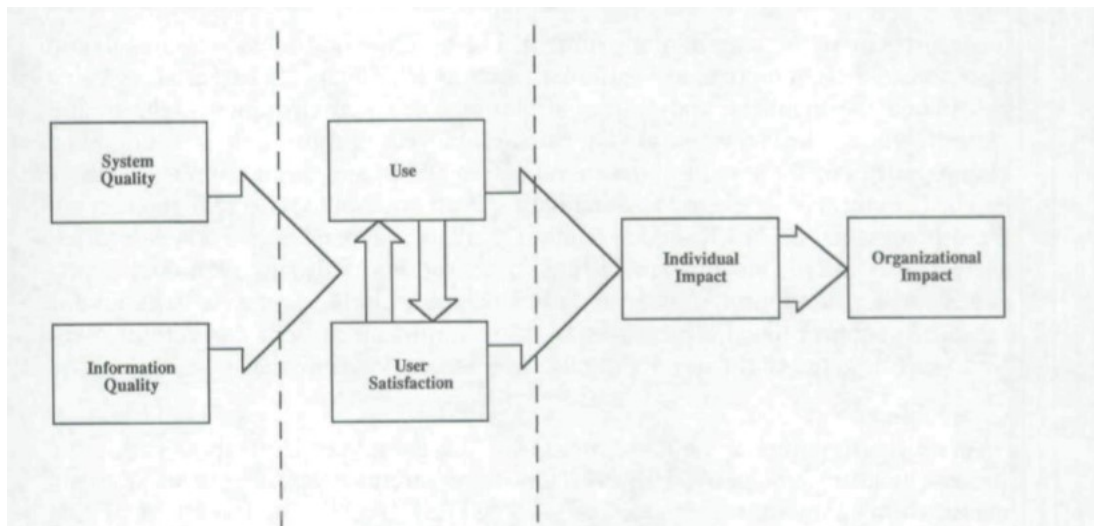


Figure 3. D&M IS model (DeLone & McLean, 1992)

However, the D&M IS success model drew criticisms from other researchers. Seddon (1997), in his paper, argued that the combination of the process and causal models makes the IS Success Model confusing. This criticism and other research contributions led to the review (figure 4) of the initial IS success model by DeLone and McLean. The authors reviewed the various criticisms and contributions from various researchers within the last ten years prior to the update. Consequently, new dimensions and a new variable were added to the older version. The new version made room for “service

quality” in the *IT system* division, the variable “intention to use” was added to the *system use* division, while the combination of the individual and organization impact made way for “net benefits”.

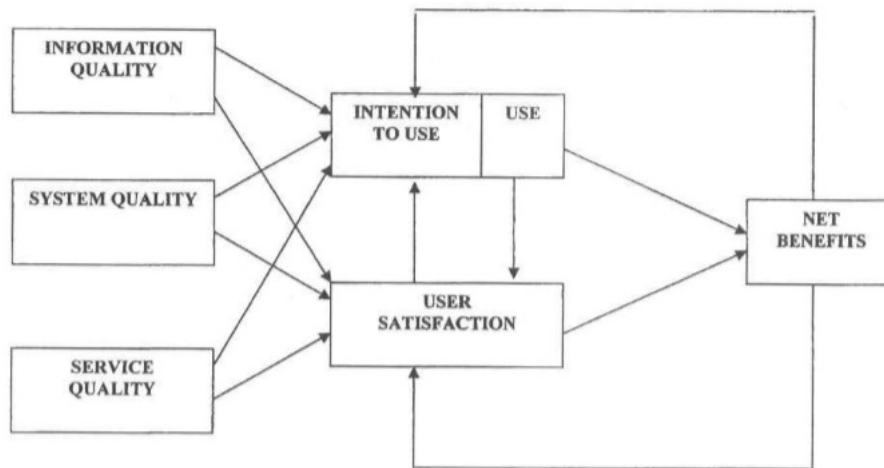


Figure 4. DeLone and McLean (2003) IS success model (Updated).

In their conclusion, DeLone and McLean made suggestions and recommendations regarding the use of the D&M IS Success Model in the future. In their opinion, context and the objectives of a research should guide the researcher in the selection of dimensions and measures to be used.

Wixom and Watson (2001) proposed seven implementation factors that influence data warehouse implementation success which were grouped into organizational, project and technical success. Parr., Shanks and Darke (1999) also had the same grouping in their study. These factors include i) management support, ii) champion, iii) resources, iv) user participation, v) team skills, vi) source systems, and vii) development technology. Management support, together with organizational factors, are important factors in the IT implementation process (Wixom & Watson 2001). The authors argued that the success of the data warehouse is contingent on these factors, which is consistent with previous literature in this field. The research model for data warehousing success by Wixom and Watson (2001) is depicted in figure 5.

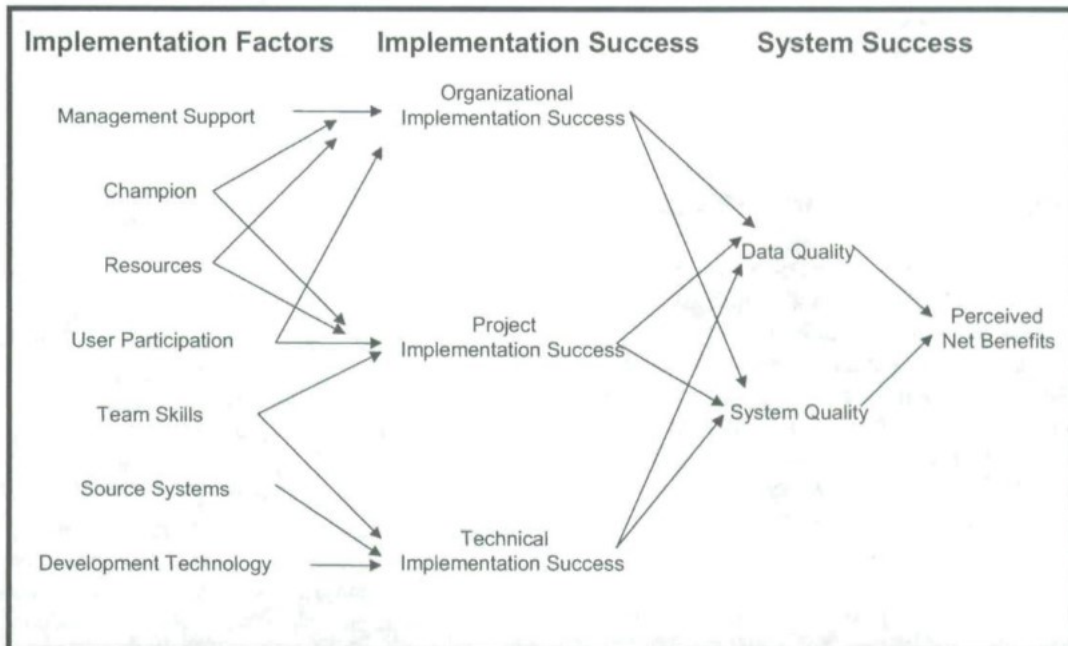


Figure 5. Research model for data warehousing success (Wixom & Watson, 2001)

Yeoh and Koronios (2010) developed an implementation framework (figure 6) in their study on the CSFs for BI systems. Their study considered two key dimensions for the BI system implementation success criteria, namely process performance and infrastructure performance. The process performance connotes process of implementation while infrastructure performance represents quality and output (Yeoh & Koronios, 2010; Yeoh & Popovič, 2016). Understandably, performance quality, in this context, can be likened to the variables in the D&M IS Success Model. Moreover, the authors' framework is based on Wixom and Watson (2001)'s research model for data warehousing success.

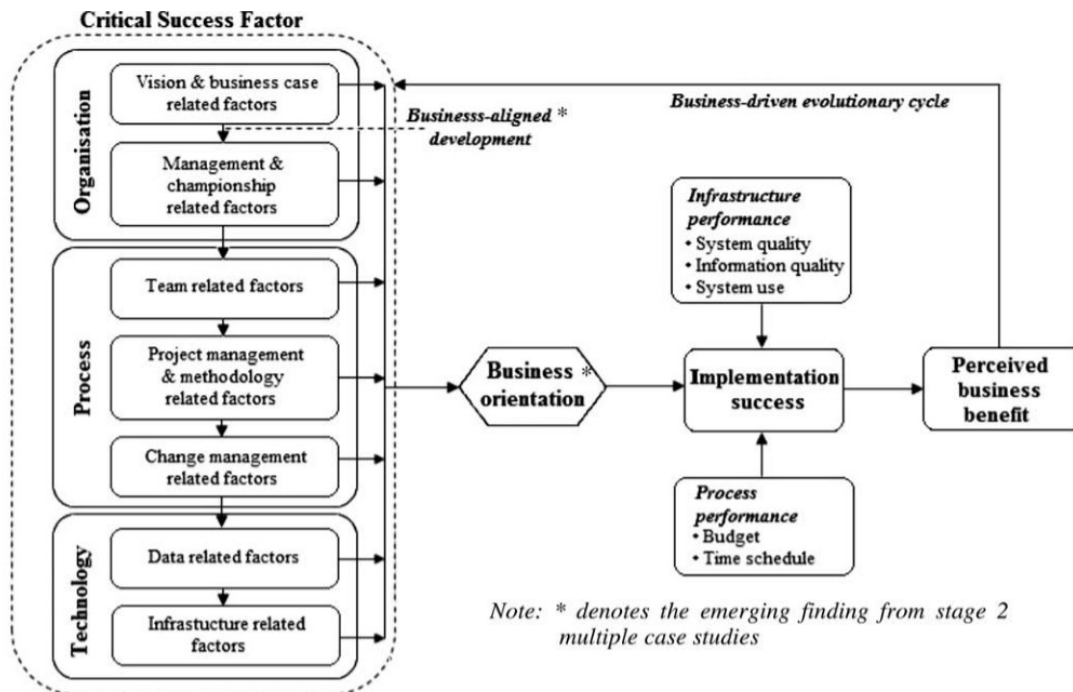


Figure 6. CSFs for BI systems implementation (Yeoh and Koronios 2010)

Yeoh and Koronios (2010) conclude that careful consideration must be given to context when applying the CSFs to BI systems and that the CSFs are different from other systems. This is consistent with DeLone and McLean (1992) and (2003)'s suggestion that context should guide the researcher in the selection of measures and dimensions. Additionally, studies reveal that organizational factors are critical in determining the successful implementation of a BI system (Yeoh, Koronios & Gao 2008, Yeoh & Koronios, 2010; Yeoh & Popovič, 2016).

Having reviewed relevant literature on IT implementation and the CSFs for implementing BI systems, it is important to consider relevant studies on CRM success as well as CSFs for CRM. Zablah et al. (2004) outline a framework to achieve CRM success. They define CRM success as a "firm's ability to efficiently build and sustain a profit-maximizing portfolio of customer relationships". The framework is composed of five key steps. The first step is to specify a "relationship management strategy". The strategy should include how the company intends to manage customer relationships by using the company's available resources based on the customer's value to the company. The next step includes

defining the processes and assigning the responsibilities to individuals. The idea is to ensure that all employees understand the process and their roles. The third step involves assessing company's CRM capabilities in terms of knowledge management and interaction management capabilities in order to determine if the company has the necessary resources to achieve their goal. This is followed by enhancing the existing capabilities if necessary. The last stage is to monitor, evaluate and improve the processes.

While it is necessary for organizations to implement Zablah et al. (2004)'s framework to achieve CRM success, the success of CRM is significantly influenced by people-related organizational factors (Cambra-Fierro et al., 2017). Since CRM is a strategy that focuses on increasing customer satisfaction and loyalty (Farhan et al., 2018), factors such as employee treatment, employee motivation and CRM know-how can have a direct implication on customer satisfaction and loyalty (Cambra-Fierro et al., 2017). This implies that companies must pay attention to these factors — employees, leadership, and know-how — for CRM success.

Farhan et al. (2018) believe that identifying systems' critical success factors will help organizations in allocating resources appropriately during system implementation. The most important CSFs of CRM, according to Farhan et al. (2018), which are classified into four dimensions are top management; information technology; skillful, motivated and trained staff; organization culture; customer data (data quality/data sharing); CRM strategy (development and communication); employee involvement/commitment; monitoring, measuring & feedback; knowledge management capabilities; and clear definition of objectives/goals.

However, having reviewed previous studies on CSFs of BI system and CRM, the CSFs of BI system for CRM will be classified into three dimensions: organizational, process, technology according to Yeoh and Popovič (2016). This framework — as depicted in figure 6 — is chosen based on the context and objective of this study as this framework can be

applied to achieve CRM success. Ultimately, the organizational factors need to be prioritised (Yeoh & Popovič, 2016). Figure 7 shows the CSFs for BI system.

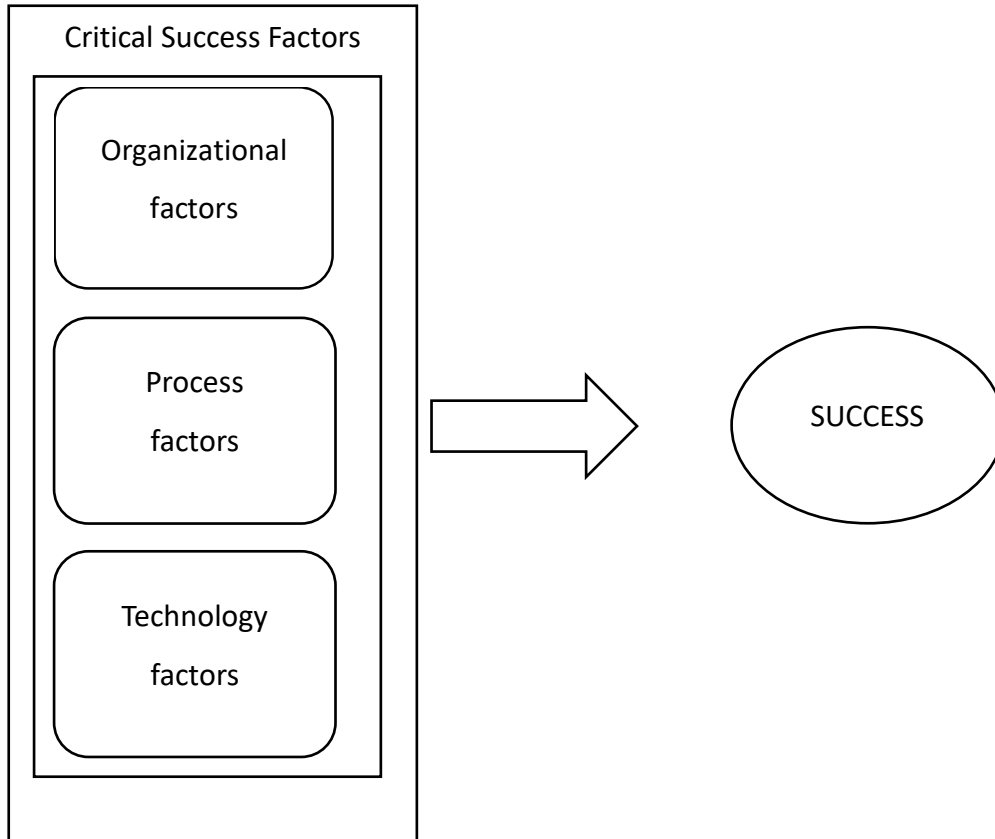


Figure 7. BI system CSFs. Adapted from Yeoh & Popovič (2016)

2.3.2 Benefits of effective use of BI systems for CRM

A BI system combines data warehouse, online analytical processing (OLAP), and dashboards tools (Ain et al., 2019). These tools have their own benefits to the organization if used in an effective manner. A data warehouse is an organised database for the purpose of reporting and enhancing decision-making only (Maheshwari, 2014). OLAP adopts a multidimensional approach for the implementation of the analytical database (Al-hadad & Zota, 2016), whereas the dashboards are front-end applications meant for visualizations (Ain et al., 2019). BI systems are decision support systems that can accrue benefits to firms (Watson, Goodhue & Wixom, 2002).

The benefits of effective use of BI systems are quite difficult to measure (Keen, 1981; Lönnqvist & Pirttimäki, 2006; Elbashir et al., 2008). Researchers argue that these benefits are qualitative and intangible (Keen, 1981; Watson et al., 2002; Lönnqvist & Pirttimäki, 2006; Elbashir et al., 2008); therefore, measuring the benefits may pose some difficulty. Elbashir et al., (2008) further argue that another reason for the perception-based measurements is that strategic or confidential data items are not open to the public. However, the benefits of effective use of BI systems, according to Dinter (2013), are business value increase, cost reduction as well as synergies. Dinter (2013)'s paper measured the benefits based on the "effective use" construct (Trieu, 2017). Elbashir et al. (2008) measured the benefits of BI systems based on the constructs — organizational, business relation, internal processes efficiency, customer intelligence — which includes time savings, costs reduction, increased profits, increased productivity, revenue increase, and improved competitive edge. Other papers outline the benefits of BI system based on the ease of measurement to include time savings for users and data suppliers, better information and informed decisions, business processes improvement, support for accomplishing company's strategic objectives (Watson et al., 2002; Watson & Wixom, 2007). Also, another benefit of the use of BI system is cost savings (Keen, 1981; Lönnqvist & Pirttimäki, 2006; Watson & Wixom, 2007).

Deng and Chi (2012) claim that when a BI system is not used effectively, there is a negative impact on business task performance due to workflow problems. The deduction from this claim on BI use process is that the ineffective use of BI system has an impact on organizational performance say positively or negatively. Thus, there are benefits to the organizational if the BI system is used effectively. However, it is necessary to state that there have been less studies on the benefits of the effective use of BI system, which this paper will address in the course of carrying out the research.

2.4 Determinants of effective use of BI system

The effective use of the BI system for managing customer relationships depends solely on some factors, which will be considered at the two levels: organizational and user level. The critical success factors of CRM, BI systems and other IT systems will be reviewed based on the context of the study in order to achieve the objectives of this paper. These factors will be considered under these two levels in the following sections.

2.4.1 Organizational level determinants

Following extensive critical review of prior studies on the critical success factors of BI system and CRM, the following factors have been highlighted as the organizational level determinants that are perceived to facilitate the effective use of BI system for managing customer relationships at the level of the management. These factors include top management support and commitment, well defined vision and goals, organizational culture, and BI capabilities and training (Ain et al., 2019). These factors are chosen from the angle of managing customer relationship.

1. Top management support and commitment

Top management support and commitment is regarded as one of the most important factors (Wixom & Watson, 2001; Yeoh & Koronios, 2010; Farhan et al., 2018) and thus, it has dominated IT, information systems and decision support systems literature. Many researchers have identified this factor as a critical factor for the adoption, utilization and success of BI systems. The support and commitment of top management in the effective utilization of the BI system cannot be overemphasised. It helps to avoid organizational issues through the continued support of the management, and provision of necessary resources for the accomplishment of the strategic goal of the organization (Yeoh & Koronios, 2010; Dinter, 2013).

2. Well defined vision and goals

Some experts have argued that most BI systems fail to give the desired results because the BI projects do not match the business vision (Yeoh & Koronios, 2010). The researchers further argue that it is difficult to meet the business needs and satisfy the customers in a situation where there are no clearly defined goals. The business goals and the objectives must be clearly defined so as to achieve the desired results (Farhan et al., 2018). Customer satisfaction is the goal of any business, and thus, using BI systems to achieve this goal should be accompanied by a well-planned vision and business goal.

3. Organizational culture

Culture is regarded as the way of life. Thus, the organizational culture must reflect or embody the philosophy of the organization. That is, since the BI system is deployed to manage customer relationships, the organizational culture must change from product-centric to customer-centric, which helps in understanding and meeting customer's needs (Farhan et al., 2018). Furthermore, organizations must ensure that employees imbibe a data-driven culture as part of the decision-making process (Watson & Wixom, 2007; Zerbino, Aloini, Dulmin & Mininno, 2018). This means that decision making should not be based on feelings.

4. BI capabilities and training

Managers must assess the state of their BI capabilities to determine if they have the required human resources that can effectively use the BI system to achieve organizational objectives. This is an assessment of the BI system capabilities. In the event that there are no competent individuals, management can bring in individuals with the required competencies. Management can also offer support by developing the competencies and capabilities of their employees (the users of the BI system) through the provision

of necessary trainings and support for the actualization of their business objectives (Watson & Wixom, 2007; Ain et al., 2019).

2.4.2 User level determinants

The user level determinants are the factors responsible for the effective utilization of the BI system at the level of the individual using the BI system. Drawing on Ain et al. (2019)'s categorization of BI system adoption and utilization, the following determinants will be considered namely employee commitment, soft skills, self-efficacy, and IT competencies. These factors enable someone to act in a certain way. It is important to state that these factors are chosen from the context of customer relationship management.

1. Employee commitment

Commitment is a "stabilizing or obliging force, that gives direction to behaviour" (Meyer & Herscovitch, 2001). What this means is that commitment ensures that one is tied or obliged to act in a certain way. In other words, it is a force that makes someone to act in a certain way. In an organization, an employee can be bound by a force, which can be in the form of desire, obligation or need (Meyer & Herscovitch, 2001). For example, when an employee is committed to a specific course of action, borne out of desire, they are more inclined towards achieving the intended outcome. Whereas, in the case of the obligation or need mind-sets, the binding force is not usually stronger (Meyer & Herscovitch, 2001). Consequently, it is expected that an employee develops the desired mind-set to the use of the BI system to manage customer relationships in order to achieve the intended outcomes, which is the core essence of the organizational strategy. This strong inclination towards a specific course of action can be influenced by shared values (Meyer & Herscovitch, 2001).

2. Soft skills

Skills are particularly important for the execution of tasks. These skills can either be soft or hard skills or a combination of both. It is argued that the level of productivity of a company is determined by the specific skills of the employees (Achmad & Cantner, 2018). Most firms usually emphasise the need for employees to have hard skills and even go further in placing importance on hard skills (technical skills, teachable or learned skills which can be proven by a certificate) in the recruitment process. However, studies have shown that although hard skills are important, they do not necessarily get the job done. They require the application of soft skills to get the job done (Weber, Crawford, Rivera & Finley, 2009). Soft skills, by definition, are “the interpersonal, human, people, or behavioural skills needed to apply technical skills and knowledge in the workplace” (Weber et al., 2011). Unlike the hard skills, soft skills cannot be taught easily. These skills are inherent — relating to one’s personality. Some of the examples of such skills are leadership, communication, problem-solving and teamwork. These skills can be effective in relationship management — that is — managing customer relationships. By applying these soft skills to hard skill (use of BI system), firms are assured of achieving organizational goals and objectives.

3. Self-efficacy

Self-efficacy relates to “people’s belief in the capabilities to mobilize the motivation, cognitive resources, and courses of action needed to exercise control of over events in their lives” (Wood & Bandura, 1989). In other words, it is the belief in one’s own ability to produce certain results. Having the required skills (hard or soft) alone, according to the conceiver (Bandura, 1977) of this concept, is not enough to produce certain results consistently. Although someone can possess certain skills to do a job, their self-efficacy is required in putting the skills to best use consistently. Moreover, one is expected to possess confidence in one’s abilities to deliver results even in a difficult situation. However,

people's perception determines the difficulty in any given situation. The difficulty level depends on one's feelings, which is connected to an individual's self-efficacy.

Wood and Bandura (1989) highlighted four sources of self-efficacy beliefs which are given as follows:

- a. *Mastery Experiences*: People's self-belief in their capabilities can be strengthened through repeated successes. When a person experiences successive success in their performance, self-doubt is defeated and vice versa. However, it is necessary for people to experience some setbacks, difficulties, or failures occasionally in order to develop a resilient spirit through perseverance, which will make them understand how to navigate through a challenging or difficult situation. This, in turn, will help people believe in their capabilities.
- b. *Modeling*: It is an act of demonstrating how observers can use different strategies to manage or cope with different situations. Through observation, models reinforces one's belief in own capabilities of doing similar things. This reinforcement can be positive or negative depending on the situation.
- c. *Social Persuasion*: When people are encouraged and motivated in what they do, their self-belief is reinforced, which in turn pushes them to do more to be successful. While it is important to give positive appraisals, motivators should be mindful of pushing people beyond the limits. Most importantly, people should be given tasks that they are capable of succeeding in and avoid placing them on unnecessary pressure.
- d. *Physiological states*: A focus on one's physical state can help to improve one's self efficacy, thereby reducing stress levels which can impact on performance.

4. IT competencies

Organizations must ensure that the BI users have adequate proficiency in the use of the BI system and knowledgeable enough to implement the company's CRM strategy to achieve set goals and objectives. As Ain et al. (2019) put it, "organizations must emphasize the development of specific capabilities and competencies of users to realize organizational success since the use of BI system is dependent on the users". The BI users also need to be dedicated to self-development in the effective use of the BI system for managing customer relationships.

2.5 Conceptualization and measurement of firm performance

Firm performance

The concept of firm performance has generated a lot of discussion in the field of strategic management and organisation research and it is mostly used as a dependent variable (Morgan & Strong, 2003; Miller, Washburn & Glick, 2013; Taouab & Issor, 2019). In today's world, companies are constantly seeking ways of remaining competitive in different markets across the globe. For this to happen, companies are expected to formulate goals and objectives, draw up strategic plans and implement these strategic plans based on the goals and objectives set out by the company. The outcomes can be referred to as performance. Firm performance, business performance or organizational performance — as the case may be — is traditionally assessed based on the profitability of the firm (Morgan & Strong, 2003). Interestingly, in spite of the interest it has generated, there is still no consensus (Taouab & Issor, 2019) on the definition of firm performance. Over the years, the definitions or explanations of the construct has been general or abstract (Miller et al. 2013), clearly or less defined (Taouab & Issor, 2019). From the 1960s to 2000s, the concept of firm performance has moved from being referred to mainly as organizational effectiveness or efficiency to being considered aggregately in terms of

competitiveness, effectiveness, and efficiency (Taouab & Issor, 2019). Moreover, when defining firm performance, it is important to consider *time* and *reference* (Santos & Brito, 2012). *Time*, in terms of the period of consideration (past or future) or duration. *Reference*, in terms of what the performance is being measured against.

Venkatraman and Ramanujam (1986) conceptualize business performance as a combination of financial performance and operational performance based on the economic goals of the company. They consider business performance as a “subset of organizational effectiveness”. In a similar vein, Santos and Brito (2012) refer to business performance as the “subset of organizational effectiveness that covers operational and financial outcomes”. Richard, Divenney, Yip and Johnson (2009) define organizational performance as a construct that includes “three specific outcomes of the firm: (a) financial performance (profits, return on assets, return on investment, etc.); (b) product market performance (sales, market share, etc.); and (c) shareholder return (total shareholder return, economic value added, etc.)”. As against the traditional belief that firm performance is assessed based on the financial performance of the firm, contemporary researchers have argued that the performance of a firm can be assessed by taking into consideration other non-financial indicators like operational performance (Venkatraman & Ramanujan, 1986) as well as market performance (Raguseo & Vitari, 2018). The market performance of a firm indicates the competitiveness of the firm being assessed.

Many researchers have put forward different arguments regarding the determinants of firm performance and how it can be measured. Hence, there is no consensus on the definition of performance as researchers tend to frame their definition of the construct based on the purpose of their research study. In their work, Miller, Washburn and Glick (2013) argue that there is inconsistency in the application of the concept of performance in research. They claim that the problem as regards the inconsistency lies with researchers placing too much emphasis on performance measurements issues instead of conceptual issues. That is, treating firm performance as a general construct in theory building while using separate constructs in the empirical work. Miller, Washburn and Glick (2013)

identified three conceptual approaches to firm performance dimensionality: latent multidimensional construct approach, separate construct approach, and aggregate construct approach.

Ultimately, there is a general belief that the quest to achieve firm's success is the main driver of performance. The performance outcomes are determined by the strategic implementation of the goals and objectives of the firm. To evaluate these outcomes, firms are however expected to consider the financial and non-financial indicators. The non-financial indicators of firm's performance can be referred to as operational performance (Venkatraman & Ramanujan, 1986), market performance (Raguseo & Vitari, 2018) or product market performance (Richard et al., 2009).

In their review, Richard et al. (2009) conclude that the study of organizational performance should be based on a theory that investigates the performance's dimensionality as well as the combination and selection of the measures to be investigated according to the research context. As mentioned earlier, the three conceptual approaches to the dimensionality of firm performance (Miller et al., 2013) include latent construct, separate construct, and aggregate construct. The latent construct generalises the concept of firm performance, the separate construct treats the concept of firm performance as separate constructs in theory and empirical testing while the aggregate construct aggregate different dimensions, which gives a wholistic view of firm performance (Miller et al., 2013).

One of the common models of firm performance measurement is the Balanced Scorecard (BSC). The BSC was developed by Robert Kaplan and David Norton in 1992 as a response to the supposedly inadequacies in other performance measurements. It was assumed that previous traditional measurements — developed during the industrial era — were more focused on financial performance measures, which does not adequately capture other critical areas of the firm's operations. The BSC combines the financial and

operational measures to present a balanced picture of the firm's operations (Kaplan & Norton, 1992).

Kaplan and Norton (1992) argued that the balanced scorecard is a fast and a wholistic way of measuring the performance of an organization. In addition, it takes into account every relevant and important information that needs to be considered for a balanced assessment of the activities of the firm. This scorecard combines both the financial measures as well as the operational measures with a view of reviewing past actions while simultaneously taking measures that will impact future performances of the firm.

Using the balanced scorecard, Kaplan and Norton (1992) identified two merits the scorecard possesses :

1. It organizes the firm's "competitive agenda" in a single report.
2. It helps to guide against the practice of making improvement changes to a segment of the operational measures while neglecting its effects on other aspects.

In summary, it is important for managers to consider all critical aspects of the firm when assessing the activities of the firm. As Kaplan and Norton (1992) state it, "what you measure is what you get." Focusing on one aspect of the firm's performance measures at the expense of the other may be counterproductive eventually. While there is no universally acceptable measurement of firm performance, the balanced scorecard provides an opportunity for managers to assess all relevant measures of the firm simultaneously. It serves as a performance measurement and control system. Moreover, company's goals and objectives can be assessed and measured within the four perspectives critical to the firm.

In spite of its contribution to the body of research, the balanced scorecard has received criticisms on the account that the assumptions by the authors are invalid as there is no

causal relationship between the four perspectives (Norreklit, 2000). The critic argues that the indicated relationship in the scorecard is based on logic.

Going by the foregoing discussion on performance measurement, one can conclude that there is no consensus on the measurement of firm performance. Performance measures can be subjective or objective, depending on the criteria for measurement. Both measures are not devoid of validity problems (Boyne, Meier, O'Toole & Walker, 2006). While the objective measures are adjudged to reflect the accurate situation and may be unbiased (Boyne et al., 2006), the indicators may be difficult to access and the measures may not be suitable for comparing between firms (Santos & Brito, 2012). Subjective measures are perception-based, that is, they are based on the perception of a firm's stakeholder (internal) or based on the judgements of a manager (Boyne et al., 2006). Despite that, studies have shown that they can be used to measure firm performance (Venkatraman & Ramanujam, 1987; Santos & Brito, 2012) and have been used extensively (Elbashir et al., 2008). Thus, the subjective measures are used in this study in order to achieve the objective of the study.

2.6 Impact of effective use of BI system on firm performance

The role of BI on firm performance has been explored over the years using different theories and models. These theories and models have suggested ways through which firms can derive maximum benefits from BI use. It is believed that its usage can improve firm performance if its capacity is effectively utilized. An investment on a BI system requires that the IT system be used effectively so as to derive maximum benefit from the investment. The impact of a BI system can be seen on a firm's improved operational efficiency, products and services, competitive intelligence, and organizational structure (Trieu, 2017).

Firms invest in BI system for improved decision making and competitive edge (Elbashir et al., 2008). Thus, it impacts on firm performance demands effective usage (Trieu, 2017), which can be viewed at two levels: internal strategy and competitive strategy (Elbashir et al., 2008). The internal strategy deals with the ability of the company to improve its operational efficiency and organizational effectiveness as well as business processes while the competitive strategy deals with the ability of the company to outperform its competitors. These impacts can be seen in cost reduction, product innovation/enhancement, increased sales, improved decision making and relationship with customers and organizational learning.

To measure the impact of the BI system on organizational performance, perception-based measurements can be used (Elbashir et al., 2008). Specifically, Elbashir et al. (2008) posit that insights into non-tangible business-related benefits can be realised using the perception-based measurements. Elbashir et al. (2008) also argued in favour of the perception-based measurements because most of the information to be measured are confidential and not made open to the public.

2.6.1 Theories related to impact of BI system on firm performance.

IT systems are developed to improve efficiency in organizations. Specifically, the BI system is designed to improve decision making in firms. Researchers have explored the perceived impacts of these IT systems on firm performance, which was reviewed in the previous section. Hence, this research paper will review some theories related to the impact of BI system on firm performance, which include the resource-based view (RBV), IS success model, theory of effective use, business process performance framework, and dynamic capabilities.

Resource-based View. The resource-based view (RBV) is a framework popularised by Barney (1991), which emphasises the exploitation of a firm's internal resources for achieving a sustainable competitive advantage. In his work, Barney posits that a firm can achieve a sustainable competitive advantage when the firm resources are heterogenous

and immobile. This implies that for a firm to enjoy a sustained competitive advantage, the firm resource must fulfil the following criteria: (i) *valuable*, improves efficiency and effectiveness (ii) *rare*, not available for exploitation (iii) *imperfectly imitable*, it cannot be easily imitated by other competitors (iv) *substitutability*, unavailability of strategically equivalent substitutes. It is noteworthy to mention that a BI system holds the potential for a sustainable competitive advantage as highlighted by Barney. As an information processing system (Barney, 1991), a firm can deploy the BI system to achieve imperfect imitability thereby resulting in a sustainable competitive advantage (Yasmin, Tatoglu, Kilic, Zaim, & Delen, 2020).

Despite its immense contribution to the body of knowledge in the field of strategic management and IS investments value, the RBV has received criticisms from scholars as regards its theoretical status. Priem and Butler (2001) argue that the RBV framework is widely accepted because it is widely applicable. They argue that the framework is static and needs some “considerable conceptual work” before it can be regarded as a theory of competitive advantage.

Dynamic Capabilities. The Dynamic Capabilities framework is an extension (Lin & Wu, 2014) of the RBV to understand how firms gain and sustain competitive advantage (Teece & Pisano, 2003). Unlike the RBV that emphasises the exploitation of the firm’s internal resources to attain competitive advantage, the dynamic-capability view (DCV) argue that competitive advantage is attained based on the “shifting character of the environment” and “the key role of strategic management in appropriately adapting, integrating, and re-configuring internal and external organizational skills, resources, and functional competences toward a changing environment” (Teece & Pisano, 2003). That is, the recognition and the understanding of the dynamic nature of the market, and the firm’s ability to appropriately respond efficiently and effectively through the exploitation of the firm internal and external resources. This approach allows firms to exploit new opportunities in the environment (Makkonen, Pohjola, Olkkonen & Koponen, 2014), and by adapting to the environment, firms are able to achieve competitive advantage (Torres, Sidorova &

Jones, 2018). However, current research highlights the important role of management decision making in the effective utilization of dynamic capabilities (Torres et al. 2018), which has an impact on firm performance. Teece and Pisano (2003) argue that firms seeking to stay ahead of their competitors in the global marketplace must show consistency in their timely response to changes in the market. They further argue that the key to this rests in the strategic management of the firm resources, which corroborates Torres et al. (2018)'s argument on the important role of management decision making in the effective utilization of dynamic capabilities.

From Use to Effective use. The theory of effective use builds on the representation theory. Burton-Jones and Grange (2013) developed the theory to address the problem of lack of research in the area and to demystify the function of information system and what drives it effective use. According to the authors, the drivers of effective use are actions taken by users to improve the effective use of information systems, which include (i) adaptations and (ii) learning. The former represents “any action a user takes to improve a system’s representation of the domain of interest” while the latter represents “any action a user takes to learn” the system and its various domains. These actions, according to Burton-Jones and Grange (2013), help the user to transition from use to effective use of information systems to achieve organization intended goals.

Business Process Performance Framework. The business process performance framework builds on the “process-oriented approach” to IT business value. Elbashir et al. (2008) followed the methodology of Churchill (1979) to develop a measurement for organizational performance based on the use of BI systems. The researchers argue that there are two levels from which BI systems’ performance impact can be viewed: internal strategy and competitive strategy. While the internal strategy deals with improving the internal business processes efficiently and effectively, the competitive strategy deals with achieving sustainable competitive advantage over competitors in the markets. They further argue that organizational performance can be measured using perception-based

measurements. The conclude that the deployment of BI system has allowed organizations to take advantage of the operational benefits.

IS Success Model. IS success model has gained acceptance and it is widely applicable in the study of IS business value. As mentioned earlier, the model was developed and updated by DeLone and McLean. The IS success model highlights the process through which firms can derive “net benefits” from the use of information systems.

Drawing on Yeoh and Koronios (2010) CSFs implementation framework and Wixom and Watson’s (2001) research model for data warehousing success, the theory of effective use and the business process performance framework will be applied to this study to provide a comprehensive process analysis framework for this study. The framework is presented in figure 8. As stated in their work, Burton-Jones and Grange (2013) argue that certain actions help users to effectively use IT systems. Since the BI system is an IT system that aids decision making in organizations, this study will apply the theory of effective use to understand what drives the effective use of BI system for managing customer relationships. The impact on firm performance will be measured following Elbashir’s (2008) business process performance framework, which used perception-based measurements as the impacts on firm performance are non-tangible, and thus, cannot be measured objectively. Another reason is because the researcher has no access to companies’ internal data.

2.6.2 Impact on firm performance

2.6.2.1 Impact on sales

Sales are business activities that have a profound impact on the profitability of the firm. Without sales, there will be no profit. This signifies the importance of sales, whether goods or services, to any for profit organization. The BI system provides an avenue for the sales team to analyze real-time sales data from the market simultaneously with other business function data, which will help in planning and forecasting future sales.

Ultimately, the BI system must be effectively utilized to derive maximum benefits from its usage (Trieu, 2017). Conversely, an ineffective use will have a negative impact on the revenue of the firm.

2.6.2.2 Impact on product innovation

Teece and Pisano (2003) highlighted the importance of product innovation when they contend that “winners in the global marketplace have been firms that can demonstrate timely responsiveness and rapid and flexible product innovation”. Firms seeking to dominate the market must continuously invest in product innovation. By this, firms will be able to satisfy existing customers, attract and retain new customers. Hence, the continuous analysis of internal and external data, enabled using a BI system, will help the firm in making decisions for creating new products or improving on older products.

2.6.2.3 Impact on cost

The impact of the effective usage of BI system can be examined at the business process performance level (Elbashir et al., 2008), in terms of cost reduction. The benefits derive from the effective usage of the BI system include “operational efficiency enhancement”, which results into firm performance (Elbashir et. Al 2008). In other words, it is referred to as the “internal processes efficiency benefits”. These benefits may include staff productivity and operational cost reduction (Elbashir et al., 2008). Cost reduction usually leads to increased profits. Since the BI system helps managers to make informed decisions, the impact of the effective usage of BI system can lead to business effectiveness, for example, cost reduction. This can, in turn, lead to increased profits for organizations.

2.6.2.4 Relationship improvement

An improved relationship with the customer often arises from a better understanding of each individual customer. In this regard, a good understanding of each individual

customer will help the firm to serve the customer better. With this, customers can be segmented and treated accordingly, and based on how valuable they are to the company using real-time information enabled by the BI system to make informed decisions. The use of customer data to better understand customer behavior can be referred to as customer intelligence. Customer intelligence benefits include time savings in new product and services development, tailored product and services for customers, as well as customer segmentation (Elbashir et al., 2008).

2.6.2.5 Learning

In the firm, learning is believed to occur at the individual level, group level, and organizational level. When an IT system like the BI system is implemented in an organization, the user, that is, the employee is expected to acquire knowledge and experience from the effective usage of the BI system, which is then passed on to the group and the organization as a whole, thereby leading to the actualization of organizational goals. This process can be referred to as organizational learning. Organizational learning is the learning process that occurs in an organization from individual and shared experiences which impacts firm performances and leads to the attainment of organizational goals (Jiménez-Jiménez & Sanz-Valle, 2011; Popova-Nowak & Cseh, 2015). Firm performance is expected to improve as employee performance improve from the effective usage of BI system and ultimately leads to gain for the firm from the learning curve. This is an important in improving firm performance and can help achieve a sustainable competitive advantage (Jiménez-Jiménez & Sanz-Valle, 2011).

2.6.2.6 Decision making

The BI system is designed to improve decision making in an organization. Hence, the effective usage of the BI system will help managers make informed decisions, which will in turn improve firm performance. Conversely, the ineffective use of the BI system will impact negatively on the decision making in the organization. Since the BI system helps

managers to make informed decisions based on real-time data, the decision-making process will be fast as managers have access to the needed information to make the right decisions. In a data driven world where swift actions are required to stay ahead of other competitors, the effective use of the BI system will not only make managers act fast; it will help managers make the right decisions.

Therefore, having comprehensively and critically reviewed borrowed and related concepts, this study sets its theoretical framework as depicted in figure 8 to propose that ***organizational and user level determinants enhance the effective utilization of BI system to increase sales, enhance product innovation, reduce cost, improve customer relationship, increase learning, and improve decision making.***

2.7 Theoretical framework of the study

Organizational level determinants

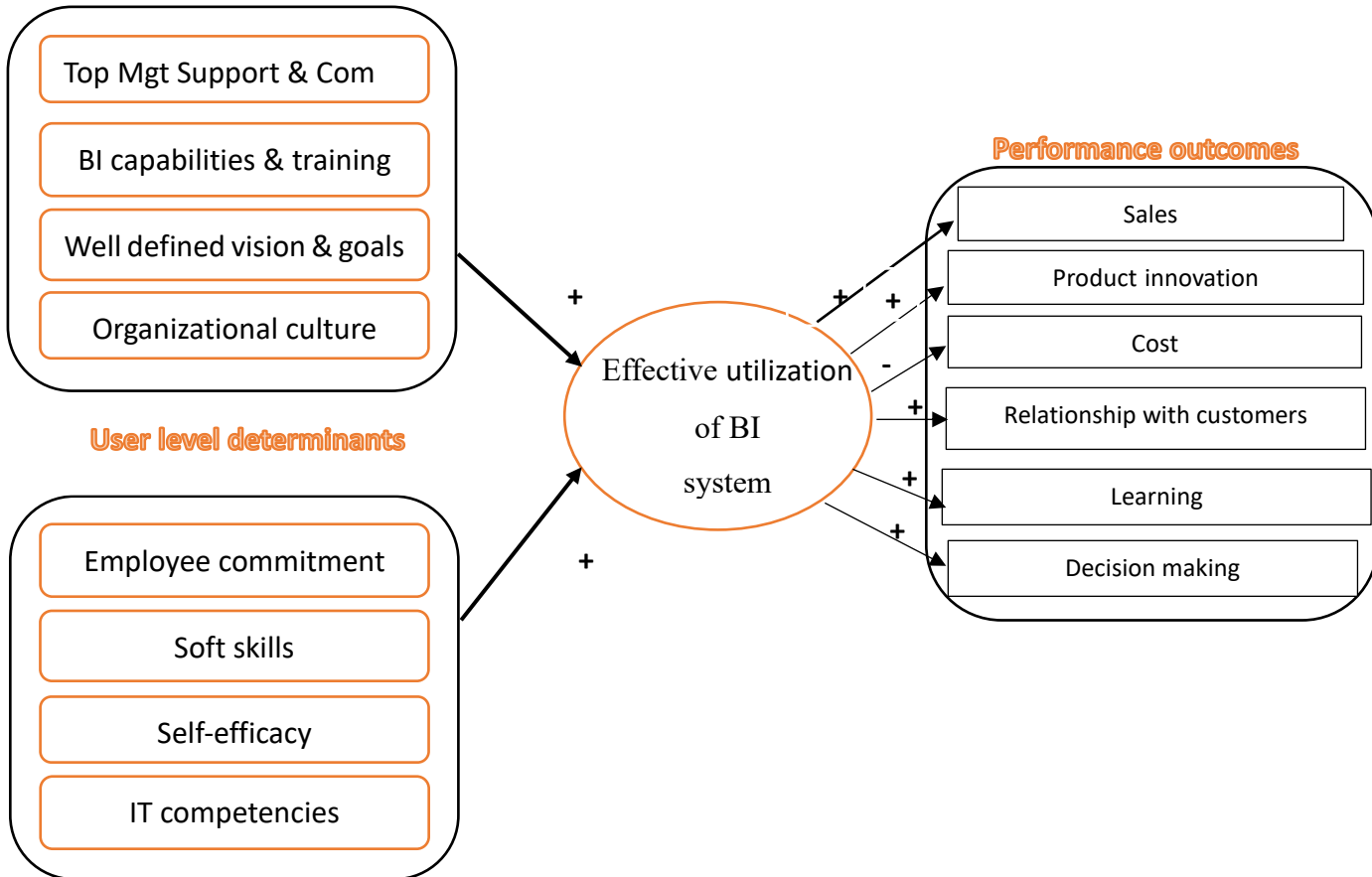


Figure 8. Drivers and performance outcomes of the effective use of BI system for managing customer relationships (own illustration).

3 RESEARCH METHODOLOGY

This chapter describes the methodology used in this study including the research strategies, the research approach, and the reason for the methodological choices. It begins with the research philosophical standpoint, which is then followed by the approach to theory development. Moreover, in this chapter, the methodological choice will be explained as well as the research strategy. Lastly, this chapter will conclude with a discussion on the techniques and procedures, time horizon, as well as validity and reliability of the research.

3.1 Research philosophy

When conducting a research, one's view is mainly guided by one's beliefs and assumptions. These assumptions and beliefs are mostly influenced by one's interactions with the social context. Thus, it is important for the researcher to adopt a philosophical stance when conducting a research, which will help in determining the appropriate methods to be used and how the findings will be interpreted (Saunders, Lewis & Thornhill, 2019: 131).

The research philosophy adopted by the researcher in this study is interpretivism. This philosophy emphasizes the essence of creating meanings from phenomenon being studied (Saunders et al., 2019: 148). This aligns with the purpose of this research which is to create new meanings and understandings based on participants experiences within the social contexts. According to Saunders et al. (2019: 179), an interpretivist is expected to "make sense of the subjective and socially constructed meanings expressed about the phenomenon being studied". Moreover, the researcher will try to make sense out of the research materials and data being collected and try to understand the participant's perspective as posited by Saunders et al. (2019:145).

3.2 Approach to theory development

The research approach for this study is deductive. This is because the researcher's aim is to test a known theory and other related theories so as to prove its validity in a given circumstance. In this case, the study is based on the effective use of business intelligence system for managing customer relationships. A deductive approach concerns the testing of hypotheses based on an existing theory (Saunders et al., 2019: 153), that is, from theory to empirical testing. Furthermore, it is believed that a deductive approach examines the causal relationships between two or more variables (Saunders et al., 2019: 153). The causal relationships being examined in this study are the drivers and performance outcomes of the effective use of business intelligence system. Additionally, the research is exploratory because there have been little or no existing studies. The approach is carried out after a careful review of appropriate and relevant literature. Subsequently, the theoretical framework of the study is designed, which will provide suggestions on the drivers and performances outcomes of the effective usage of BI system for managing customer relationships.

3.3 Methodological choice

In a research project, it is not uncommon for researchers to be faced with the challenge of choosing between the quantitative, qualitative or the mixed methods research design. It is argued that a researcher's methodological choice is determined by the researcher's philosophical assumptions, approach to theory development as well as the research strategies (Saunders et al., 2019: 175-176). Based on the foregoing argument, the researcher's methodological choice for this study is the qualitative research design. The qualitative research involves any data collection technique that does not utilize numerical data for data analysis (Saunders et al., 2019: 175). It is a research design which utilizes interview as a data collection technique. While it is not uncommon for researchers to begin their qualitative research using an inductive approach, the deductive approach to theory development can also be used to test existing theories (Saunders et al., 2019:

179). In this research, the researcher's approach to theory development is to test an existing theory on the effective use of business intelligence for managing customer relationships so as to have a clearer understanding of the phenomenon being studied. Specifically, the methodological choice is influenced by the need to understand people's experiences as posited by Silverman (2020: 3). These experiences, when interpreted by the researcher, help to increase the understanding of a particular phenomenon by explaining the relationships between concepts or variables. Some of the characteristics of the qualitative research design which influenced the researcher's choice include i) the data collection method is semi-structured or unstructured; ii) meanings are derived from words and images; iii) collected data are classified into categories for analytical purposes (Saunders et al., 2019: 179).

3.4 Research strategy

The research strategy for this study is the case study research, that is, multiple case design. This section describes how the researcher intends to provide answers to the research question. Basically, choosing the right research strategy has a lot to do with how the researcher intends to collect the research data. Additionally, it is pertinent to state that one's research questions, objectives, research approach, resources, time, as well as access to data usually serve as the basis for one's research strategy (Saunders et al., 2019: 190). Consequently, the researcher's choice was based on these factors. Moreover, the researcher intends to investigate the drivers and performance outcomes of the effective use of business intelligence systems by exploring the phenomenon on a case-by-case basis, thereby comparing the results according to size and the unique features of each individual case company. The ultimate idea is to gain a deep understanding of the phenomenon being explored within its context to determine if there are some similarities or differences in the cases.

3.5 Time horizon

Since this research is conducted in order to fulfil an academic requirement, the time horizon for this study is cross-sectional. This is because the research is time constrained. That is, the study is expected to be conducted and concluded within a short period of time. To fulfil this requirement, the researcher opted for the cross-sectional time horizon. Saunders et al. (2019: 212) argue that cross-sectional time horizon is mostly suited for students since most research works are usually taken as academic courses, which must be concluded within a short period of time. While it is time constrained, the study seeks to explore the phenomenon within its context at this given time.

3.6 Research techniques

This section of this thesis explains the research technique employed by the researcher to achieve the aim of the study. It provides an explanation for the data collection technique as well as the reason behind the chosen technique.

3.6.1 Data collection

Interview is used for data collection in this thesis. This research technique is widely used by a lot of researchers as a means of data collection. Interview is simply a fact-finding conversation between the interviewer (person conducting the interview) and the interviewee (respondent). Gillham (2000: 1) defines interview as a conversation between two persons, where one party (interviewer) is seeking information from another party (interviewee), which does not necessarily benefit the interviewee. The purpose of an interview determines the “form and style”, which can be medical, selection, therapeutic, market research, or research (Gillham, 2000: 1).

Going by the purpose of an interview as indicated earlier, Saunders et al. (2019: 434) define the research interview as a “purposeful conversation between two or more

people”, where the interviewee is asked questions and the interviewer listens. The purposeful nature of the conversation clearly dictates the form and style. The researcher is expected to build a rapport with the participant during the interview process. This helps the researcher to collect the needed data that provide answers to the research question(s). According to Saunders et al. (2019: 437), the research interviews can be categorized into three: structured, semi-structured, and in-depth interviews (unstructured).

The type of research interview chosen for this thesis is the semi-structured interview. Semi-structured interview is a non-standardized interview. As a non-standardized interview, the semi-structured interview was chosen to achieve the aims of the research, which is to explore and gain deep understanding of the drivers and performance outcomes of the effective use of business intelligence systems for managing customer relationships. It was chosen because it gives room for flexibility during the interview and new insights can emerge as a result. Specifically, it gave the researcher and the participants the opportunity to freely express themselves.

3.7 Research procedure

The research procedure carried out in this study is presented in the following subsections. It contains the procedure for target group and sampling as well as the procedure for data collection.

3.7.1 Target group and sampling

Key business managers are the target group for this study who are directly or indirectly involved in building and managing customer relationships in their companies. The managers were expected to meet some certain criteria for selection for the interview which include knowledge of the BI system, considerable number of years of experience in their roles as managers, and sales or relationship management experience. Moreover, the participants were required to be working in the energy industry or managing energy

related projects. Also, the participating companies must be global or simply have international experience in their business operations.

A non-probability sampling method was selected for this thesis. The method selected was purposive sampling. According to Saunders et al. (2019: 321), this method allows a researcher to use their judgement to select a case or cases that will be best suited to answer their research questions and achieve the research objectives. While this is not a statistical representation of the intended population, the sample cases were carefully selected based on the well thought out selection criteria. Moreover, the sample cases were selected based on the research strategy which is intended to provide the necessary information that are needed to answer the research questions and effectively meet the research objectives. In addition, the researcher selected the participants using heterogeneous sampling. That is, even though the selected participants are managers in their respective companies with almost similar experiences, the case companies differ in terms of size, market share and international experience. This is to enable the researcher to analyze possible variations and patterns in the data collected.

3.8 Data collection

This section includes the discussion on the process of collecting data for this study using the semi-structured research interview. It contains a brief discussion on the interview preparation, interviewing the participants, and other ethical considerations needed to be observed for research purposes.

3.8.1 Pre-interview

Firstly, the pre-interview process began with the researcher developing a considerably level of knowledge in the research topic and the participating organizations. This was made possible by reading relevant articles and accessing relevant research databases through the university library. The researcher explored these databases for relevant

information about the participating organizations and to increase knowledge in the research topic. The researcher also accessed the organizations' webpages for necessary information that would aid the conduct of the interview. Thus, the researcher was able to draw on the relevant information which helped in the interview process. Moreover, the researcher's knowledge about different cultures played a vital role in the interview as the interviewees were of different cultural backgrounds. Serious attention was paid to understanding and overcoming any challenges emanating from cultural differences.

Secondly, the researcher began the process of developing the interview themes. The interview themes were sourced from academic literatures, personal experience, and own discretion. Then, a discussion was held with the supervisor of this thesis for more inputs, after which the interview themes were developed. The interview questionnaire was divided into three parts. The first part deals with the basic background information of the interviewee and the use of BI system in the participating organization. The second part covers questions about the determinants (drivers) of the effective use of BI system while the third part comprises questions regarding the performance outcomes (organizational outcomes) of the effective use of BI system for managing customer relationships.

Following the development of the interview themes, the interview themes were sent to the interviewees beforehand to ensure credibility. This was an important step taken by the researcher to provide the interviewees with the necessary information to familiarize themselves with the themes and help them prepare well ahead of time for the interview. This was also done to build trust and ensure good rapport during the interview. Saunders et al. (2019: 452) suggest that providing the interviewees with the themes ensures validity and reliability as it helps them understand what the researcher is interested in, which in turn helps them prepare well for the interview. The questions were open-ended and straightforward, using simple and easy to understand words.

To physically gain access to the participants, the author of this study utilized the available network of friends, colleagues, and social networking site. The researcher made phone

calls, sent emails, and took advantage of LinkedIn to gain access to the participants. The interviewees were informed about the research topic, objectives of the research and the duration in an email, accompanied by the list of themes for the interview. This followed by a follow-up email/phone calls to establish time and date for the interview. The researcher was able to secure audience with four participants for the interview, which happened separately.

3.8.2 Interview

Since this study was conducted during the covid-19 pandemic when companies around globe switched to remote work, the interviews were conducted via Zoom bar one, which took place at the interviewee's office. The interviews were conducted in Vaasa between Autumn 2020 to Winter 2021. Each interview was conducted in English language and lasted between 35 to 40 minutes, with each participant giving their consent to the recording of the interviews. The interview started with the interviewer giving a summary of the objectives of the study to ensure credibility and build rapport with the participants. Participants were advised to ask clarifying questions where the questions seemed unclear or difficult to understand to avoid any misinterpretations.

3.8.3 Ethical issues

It is important to highlight the ethical principles adhered to during the process of data collection in this study. Firstly, no participant was forced or coerced to take part in this research. Each participant was given the freedom to participate and to withdraw if deemed fit. The researcher ensured that the rights of each participant were maintained throughout the course of collecting data. Secondly, the privacy of each participant was not invaded, and no harm was caused in the process as the participants were allowed to dictate how, where, and when they wanted the interview to take place. Thirdly, the researcher ensured that there was no form of deceit in the process of negotiating access and collecting data as the ethical principle of data collection was strictly adhered to in this regard. Fourthly, the maintenance of objectivity was ensured through the course of

data collection. The data was accurately collected and recorded without any form of falsification or fabrication as this can have an implication on the credibility of the research results. Lastly, the researcher avoided asking overzealous questions which could undermine the integrity of the data collected. Participants were allowed to freely express themselves without any form of pressure.

Furthermore, on the issue of data privacy, personal details of each participant were not collected aside details regarding their roles and responsibilities in their respective organizations. Moreover, organizational data that is not meant for public consumption was strictly avoided during the course of data collection. The researcher understands and respects the right to data privacy as contained in the European Union (EU) General Data Protection Regulation (GDPR) which protects the personal data of individuals within the EU.

3.9 Analysis

As mentioned earlier, the semi-structured interview was conducted for data collection. The interviews were conducted via Zoom, except for one that took place at the participant's office. The interviews were recorded and transcribed using a paid transcription service on the internet. Notes were also taken (where necessary) during the interview to avoid any loss of data. Each transcribed document was saved in a separate file on the researcher's computer and on the cloud. The transcribed data were then coded and analyzed according to the interview themes .

3.10 Data quality issues

Reliability and validity are concepts that determine the quality of a research work. These concepts represent the two components of the term — objectivity (Kirk & Miller, 1986). This implies that the quality of a research is measured in terms of its objectivity. And

measurement in this context refers to the consideration of the “observable response” and the “concept” it represents (Carmines & Zeller, 1979). According to Kirk and Miller (1986), reliability refers to “the extent to which a measurement procedure yields the same answer however and whenever it is carried out”, while validity refers to “the extent to which it gives the correct answer”. Simply put, reliability is about consistency while validity concerns accuracy.

On the issue of the reliability in a qualitative study, the concern is mostly associated with the quality of the study (Golafshani, 2003). That is, if the same results can be produced by other researchers given the same condition. However, the issue of reliability can be a challenge given the fact that the data-driven semi-structured interview is a non-standardized interview, which reflects the reality at a given time (Saunders et al., 2019: 449). This implies that the possibility of replicating this research may be unrealistic. To overcome this issue and ensure dependability, the researcher has provided a detailed step-by-step process of how the data was collected, in-depth explanation of the research design, and the reasons for the choice of methods and strategy.

To overcome concerns regarding the credibility of this study, clarifying and probing questions were used during the interview. Participants were probed and asked clarifying questions in a manner that would elicit the right responses. Each response was explored from different angles as suggested by Saunders et al. (2019). Consequently, the objectives of this study were achieved.

It is not uncommon to have concerns regarding generalizing the findings of a qualitative research which involves “only one case” or a “small number of cases” (Saunders et al. 2019). While this may be true regarding making statistical generalizations, the findings of this study are meant to test an existing theory regarding the effective use of BI system for managing customer relationships, which is more significant.

Another concern about data quality issue is the issue of bias. According to Saunders et al. (2019), the three types of potential bias associated with a semi-structured interview include interviewer bias, interviewee or response bias, and participation bias.

Interviewer bias is simply a situation where an interviewer's verbal and non-verbal behaviour influences the outcome of an interview. Regarding the Interviewee bias, this bias relates to the perception of interviewee towards the interviewer, which may affect or influence the outcome of the interview. Participation bias is similar to interviewee bias. According to Saunders et al. (2019), participation bias may arise from the duration of an interview.

Although the issue of bias is a concern for this study, the steps taken to overcome this issue has been addressed in the previous section in the pre-interview and the interview stages. Furthermore, issues regarding cultural differences which may affect the data quality have also been addressed. These steps taken to address these issues have been explained in the previous section in the interview stage.

4 EMPIRICAL FINDINGS OF THE RESEARCH

The findings of this research are presented in this section of the thesis. The collected data, including direct quotes from the interview, will be presented in this section for analysis. It begins with a brief introduction of each participating company, which is then followed by a presentation of the findings of the research on drivers and performance outcomes of the effective use of business intelligence for managing customer relationships.

4.1 Case companies

ABB (Participant 1)

ABB (ASEA Brown Boveri) is a Swedish-Swiss multinational corporation with more than 130 years of experience in innovative technology for building and transforming the society through the provision of innovative solutions for a sustainable future. The company is a “global leader in power grids, electrification products, industrial automation and robotics, and motion, serving customers in utilities, industry, transport, and infrastructure”. The company’s four focused areas in business include electrification, process automation, motion, and robotics and discrete automation. As a global company, ABB has about 147,000 employees and has operations in more than 100 countries.

ABB operates under a unique framework known as the “ABB Way”. This framework consists of two parts — the “how” and “why”. The “how” signifies how the company intends to operate and create value under the following divisions: Business model, People and Culture, Governance, and Brand. The “why” stands for the purpose of the company. The “ABB Way” is the core strategy of the company with priorities in market leadership, technology and digital, people, portfolio management, sustainability, and financial performance. The company provides different products and services for various customers in many different industries around the globe (see company’s website). The company’s

representative works in the organization as a business development manager in sales and marketing, with experience spanning over 14 years.

Wärtsilä (Participant 2)

As a global leader in the energy and marine industries, Wärtsilä specialises in providing its customers with “complete lifecycle solutions” for their vessels and power plants. The company does it using smart technologies which is geared towards achieving a more sustainable society. With business operations in more than 200 locations, Wärtsilä had over 18000 employees (as at December 2020) spread across 70 countries around the globe. The company is focused on providing innovative products, solutions, and services to its esteemed customers in the marine and energy markets. Its corporate structure consists of i) Wärtsilä Marine Power, ii) Wärtsilä Marine Systems, iii) Wärtsilä Voyage, iv) Wärtsilä Energy, and v) Wärtsilä Portfolio Business.

Wärtsilä’s business strategy is centred on leading the push towards a future of smart marine and 100% renewable smart energy. To provide a 24/7 support for its customers, Wärtsilä has a dedicated platform called “Wärtsilä Online” where customers can have access to real-time information and data for their own use. As mentioned earlier, Wärtsilä provides lifecycle solutions for its customers. Its services and solutions include “spare parts and field services”, technical support, training services, cyber services, lifecycle solutions for energy, and lifecycle solutions for marine (see company’s website). The company’s representative is a business development manager in the sales department, with about 27 years of experience in the company.

Promeco Group (Participant 3)

Promeco Group is a family-owned business, which comprises Promeco Oy, VM-Group Oy, and Promeco S.A. VM-Group Oy was founded in 1971 and thus, the history of Promeco Group could be traced back to when VM-Group Oy was founded in 1971. However, it

became Promeco Group when these three companies (VM-Group Oy, KMT Group Oy, JAT-Asennus Oy) came together in 2009 to form the new company. Promeco business strategy includes providing specialised lifecycle solutions to its customers in the manufacturing and engineering markets. The company offers tailor-made services for its customers. With about 500 employees in five different locations in Finland, Poland, and China, Promeco Group key business areas include marine and offshore, railway industry, energy solutions and industrial machinery. Some of the company's clients are ABB, Wärtsilä, Siemens, Bombardier, among others.

As part of its expansion programme, Promeco Group went into an agreement with JTK Power in China to establish a joint venture. This move gave birth to Promeco JTK China. The unit specialises in manufacturing demanding steel products and automation for the marine markets in Asia and other parts of the world (see company's website). The representative of the company is one of the units' head in Finland.

Prohoc Group

Prohoc is a project-partner company that deals in offering tailor-made project management services for its customers in mining, energy, oil and gas, and marine industry. The company specialises in complete project execution or some areas of it, depending on customer's needs. Prohoc's business areas include project management and control, construction management and commissioning, and project information management. The company, when contracted, takes full responsibility or handles a defined set of activities of the project based on the contractual arrangement. In addition, Prohoc manages and supervises construction and also manages the digitalisation of project information. The company's clients include Wärtsilä, Valmet, Metso, Neste, among others. Prohoc Group includes Pro ID and Proactor, which are all located in Finland(see company's website). The company's representative is one of the senior executives of the company, with a wealth of experience in the industry.

Table 2 shows some basic information about the case companies.

Table 2. Some basic information about the case companies (Source: companies' websites)

<i>Company</i>	ABB	Wärtsilä	Promeco	Prohoc
<i>Established</i>	1988 (formerly ASEA e. 1883 & BBC e. 1891)	1834	1971	1997
<i>Industry</i>	Energy, Automation, Electrical, Robotics	Marine and Energy	Manufacturing, Energy	Management, Energy
<i>No. of employees</i>	147,000	18,000	500	100
<i>Business operations</i>	Over 100 countries	Over 70 countries	3 countries	1 country
<i>Revenue</i>	€22.1 billion (2020 estimates)	€4.6 billion (2020 estimates)	€28.1 million (2020 estimates)	€10.4 million (2019 estimates)

Figure 9 shows the gender distribution of the participants.

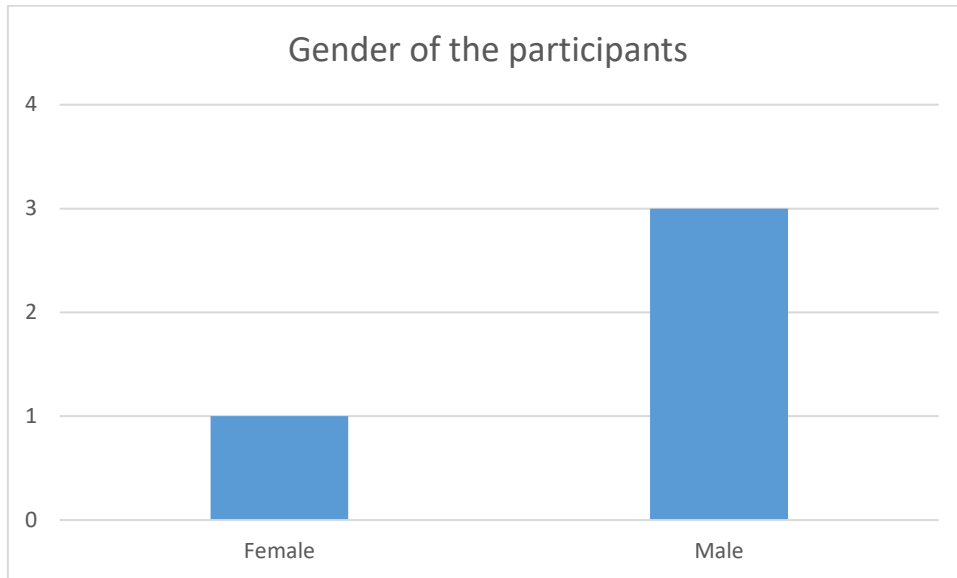


Figure 9. Gender of the participants

Figure 10 depicts the nationality distribution of the participants.

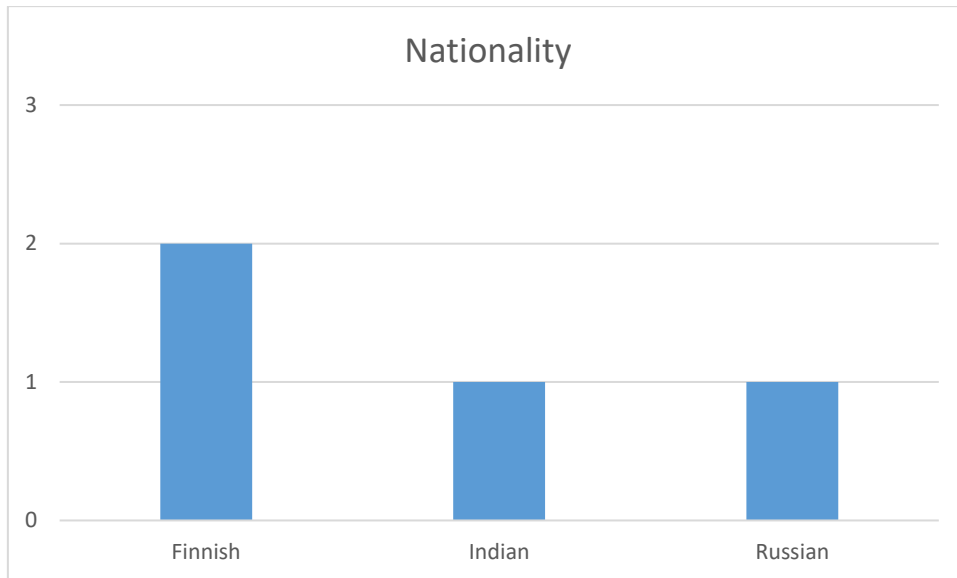


Figure 10. Nationality of interviewees

4.2 Basic information on the use of BI system

As mention earlier in the research methodology, the research questionnaire is divided into three: basic information, determinants (drivers), and performance outcomes (organizational performance). In this section, some generation information about the use of BI system will be presented in table 3 for comparison, clarity and better understanding.

Table 3. Basic information on the use of BI system

Participants	BI system(tool)	Length of usage	Frequency of usage	Reason(s)
Participant 1	SAP, Salesforce CRM, Power BI	>10 years	Everyday	Reporting, visibility, functionality
Participant 2	Salesforce, SAP	>10 years	Regularly	For collaborations, communications
Participant 3	Power BI	>2years	Daily, weekly, monthly,	Data needs, *KPIs (measurement), Visualization, BI needs, Target needs
Participant 4	Salesforce	>2years	Daily, weekly	Reporting, prediction, forecast, effective and efficient management of customer data

*KPI means Key Performance Indicator

As a decision support system, many organizations embrace the use of BI systems to aid decision making in their organizations. The reason for the adoption or use of a BI system may not be unconnected to need to take advantage of the numerous benefits the technology presents. Based on the research findings, companies use it for reporting, forecasting, predicting, visualizations, data management amongst others.

“...process adjustment. To make the process easier, to create more clear reporting. I would say a lot of tools we’re using for reporting. Yeah, I would say visibility and functionality.” [P1]

“...It is a tool. So, the main thing we use it for is collaborations, communication. And maybe I can say it makes our work easier, especially when it comes to reporting.” [P2]

“...The tool helps us with our data needs. We use it to measure and assess our KPIs in the company. And erm, we also use it for visualizations, BI needs. We use it to meet our targets.” [P3]

“... like in sales and business, let’s say somehow if I tried to put it in, in a few words. So we would be use it also in order to see our sales pipeline in the future. Okay, so we can see how many what is the business volume, what we have recognised and SM opportunities in the future? And then we also close all the deals there. So we can also follow the order intake. Okay, what is what is the value of the business? We have signed the contract? So, so it's this? I think that's quite typical way of utilising the system.” [P4]

4.3 Determinants (Drivers)

In this study, the determinants of the effective use of BI system are categorised into two levels: organizational level determinants and user level determinants. The organizational level determinants are top management support and commitment, BI capabilities and training, well defined vision and goals, and organizational culture. The user level determinants include employee commitment, soft skills, self-efficacy, and IT competencies.

4.3.1 Top management support and commitment

Researchers have argued that top management support and commitment is a critical factor for the adoption, utilization, and success of BI systems. Consequently, as a factor for effective utilization of BI system, participants were asked if they agree with the assertion that top management support and commitment is essential for the effective utilization of the BI system. The answers provided are presented as follows.

“For some tools which you need for your own daily operations. You don't need to push anyone to use them. Of course, we have some tools which needs to be, which kind of, kind of like are told to be used. Okay. So I mean, it comes from the top requirement to use it, to update it on like quarterly basis and so on. And different kind of like, I don't know, initiatives or standards to encourage the people to use them more and more. I mean, for example, local in the salesforce, know that there are some initiatives in the country to push their sales guys put more leads into the Salesforce”. [P1]

“First and foremost it is a tool. So you can't force people to use it. Of course the company encourages everyone to use them regularly. Like for example, we use SAP and Salesforce and company ensures that everyone is adequately skilled to use these tools for their daily tasks. It's a big investment, so we try to ensure it's used properly” [P2]

“We set the targets based on our group level strategy, meaning that every employee should have the focused target setting in every fiscal year.” [P3]

“...I have learned something during my, you know, professional years that no one is using anything if it's not useful, if if the people cannot see any benefit to put the information in the system, they will never do it. But you have to ensure or the way to ensure is to make the tool the way of working and develop the practices and procedures so that everyone can see the benefit for themselves. This is what happens... [P4]”

4.3.2 BI capabilities and training

For the BI system to achieve organizational objectives, it is necessary to assess organizational BI capabilities; provide trainings or bring in individuals with the required competencies as the case may be. Below are the quoted responses.

“Our experience shows that we need at least a few professionals who are taking care of the BI infrastructure and updates, in that way we can ensure the effective use of the system.” [P3]

“I hundred percent agree with this question. It's important to have some professionals handling these tools to actually get the best out of it.”[P2]

“Yeah, because you know, especially when, when you are talking about the reporting part, many of us are allergic to... but the thing is that someone needs to report in order to know where we are... if you can use them you know, efficiently, then it is efficient.”[P4]

The knowledge of the BI system helps businesses to save time, money, and efforts.

“if you know how to use the system well — actually, most of the systems generate the required reports automatically — you save a lot of time, money, and you know, efforts. Yes, that's absolutely true.”[P4]

However, it is believed that most tools, these days, are easy to use. Thus, it does not require any special knowledge or training. This was one of the comments of the participants which is presented below.

“... it depends what you need from that tool and you use it for what you need... nowadays, all the tools are very user friendly. It's easy to use.”

4.3.3 Organizational culture

Organizational culture is embedded in the philosophy of the organization. Thus, company practices and actions usually reflect that. Since the BI system plays a role in the day-to-day activities of the organization, the participants were asked about the importance of organizational culture in the effective utilization of the BI system.

“Working culture has a significant role when we are planning, implementing new tools or way of working. Positive and experimental culture ensures that the project implementation is going as planned.”[P3]

“...it's very difficult to go there if you do not know where you are. And then this reporting is about continuing, a little bit this is it the cultural thing, but this is also not not my own words, but this is what I have learned that someone is talking about the report. If you use this tool well, you can forecast something and see what is happening in the future... If I have a team more than me 1,2,3, let's say 200 people, I cannot manage it anymore without some kind of system, some kind of procedures, what everyone is following, or you must trust the numbers what I can see on my screen”.[P4]

“I can say personally that there are no tools that would be useless, but we are still forced to use them. So it was all the tools mainly selected to make the job even more efficient.”[P1]

“It is a way of doing things. So, I would say it is part of way of making sure customers are happy. Customers are at the heart of our businesses. So, yes, it is important.” [P2]

4.3.4 Well defined vision and goals

Goals and vision are defined to direct the path of the organization. Thus, it is important for an organization to communicate the set goals and vision, and ways of achieving the desired results to every member of the organization. The participants were asked how these affect the use of BI system in their respective organizations.

Communication

“Customer retention is the focus of the company. We usually communicate the company’s goals and vision to every member of the team. We do this regularly.[P2]”

Set targets

“As mentioned before, the targets should be set so that every single smaller target and goal is connected somehow into the group level strategy. [P3]”

Set targets, performance indicators and communication

“if you use these tools, well, you can also forecast something. Yes, you can see what is happening in the future. Yes. And think about it, you are again driving a car. Are you using your mirror? Or would you like to see what is in front of you?”

It's much more better to drive the car so that you know where you are in the front. But it's very difficult to drive the car based on the facts what happened a couple of seconds ago. Yes, that's also important but maybe it's more important to know what is there in front of you. Yes. So these things. Metres and key indicators: why they are they interesting? Think about it again, you are flying, you know the air-plane without any metres, it's very difficult. So you are blind if you do not have this information somewhere, especially when you are leading the business. Of course I can manage quite well. Not very well but I have to somehow. I can manage the things with that. If I have a team more than me 123, let's say 200 people, I cannot manage it anymore without some kind of system, some kind of procedures, what everyone is following. [P4] ”

BI system is just a tool to make work efficient

“the tools are not the company’s vision. We have much, much more important focus, like quality customers and so on. The usage of the tool helps, it's a tool to make the processes more efficient. [P1] ”

In addition, the participants were asked about the main driver of the effective use of BI system in their organization based on experience. Their answers are provided as follows.

1. Organizational Need

“The main driver is the need.[P2]”

2. Well defined vision, goals, and objectives

“It is that we know where we are going and what is our future? It is absolutely that because you know, even if the future is not every time very optimistic, for

example, it can be very, you know, dark in the in the future. Compared For example, one year back. But if you know it early enough, you have time to react somehow. Yes. These are the things which are the main drivers. No one, no one wants any surprises... But in a business, actually, somebody says, oh, this is a nice surprise that we won this case. But what it actually tells something. if you win a big deal, and it's a surprise to you, from business, as the business leader, I am thinking that I have serious problem. Yes. I need to know what is happening tomorrow. What is happening next week, next month, next year, it's difficult to see the near future, at least, I need to know what is happening, even if it's not very positive thing. That's the driver to know what to do in order to have time to react.”[P4]

3. Motivated personnel, Clear target setting, Regular follow up, Successful examples

“I would say motivated personnel, clear target setting, regular follow up and successful examples are working as main drivers in BI system introduction.”[P3]

4. Functionality, Value, Perceived benefits

“Understanding that it's makes the processes more efficient and easier to cooperate. I would say usually, all the tools implemented make life easier.”[P1]

4.3.5 Employee commitment

Commitment ensures that one acts in a certain way. In a case of employee commitment, the participants were asked about their thoughts regarding employee commitment as driver for the effective use of BI system.

Employee commitment is important.

“Yes, it should be there. I mean, you don't use something if you don't need it.”[P1]

“Of course, hundred percent. If they are not committed to use, they will be no results.”[P2]

“I think commitment is the base of doing things and there, I can see the importance of professional supervising.”[P3]

“Yes, employee commitment is the real factor but the commitment? Sure. If I answer directly to the question, yes, the commitment is the key factor. Everyone shall use them as we have agreed, right? Yes. But from a business leader point of view, the key point is how to have employees committed, how to make them committed, that's the thing”[P4]

4.3.6 Soft skills

The emphasis, these days, is changing towards soft skills in employees. This is obvious in job vacancy advertisements these days. Participants were asked about the significance of soft skills in this context.

Interpersonal, behavioural skills are important

“of course it's a huge amount of the tools which are coming and so you can take position Okay, it's something new again, I don't give a shit about that. So I will do like it I used to. But you can take another sight and check. I mean, but you need to drive with yourself to check how it could be useful for me, how we can how I can implement it. And, you know, you need to find the person who will, who's leading that. So who can tell you all the hidden things which can make it even better. So I mean, yeah, it's, it's soft skills, definitely helping.” [P1]

“It plays a good role, especially leadership skills.” [P2]

“But what the soft skills means for me that the good leader is capable to add just the behaviour, depending on the person... So, yes. It is very important.” [P4]

4.3.7 Self-efficacy

Self-efficacy relates to people’s belief in their ability to produce certain results. This study finds out how this drives the effective use of BI system to manage customer relationships.

“Common sense and natural self confidence are sufficient when using BI system.” [P3]

“I cannot transfer the message of the importance. it's absolutely left to be done or it's the must, that you believe yourself, what you are.” [P4]

BI system is just a tool

“Of course, one needs to belief in oneself but this thing is just a tool” [P1]

4.3.8 IT competencies

Participants responses regarding the role employee IT skills play in the effective use of BI system are presented below.

Only basic IT skills needed; tools are user-friendly

“If we are speaking software skills I should say that it depends on the role, of course the basic IT skills are needed in modern working environment but everyone doesn’t need to be a professional coder to managing a fruitful relationships with the customer.” [P4]

“Um, I mean, it depends what role you have. For size roles, like the sales and so on, usually, we have very user friendly tools. I mean, it's really user friendly. You just need to explain to someone how to do it and so on. Of course, there are for example, in departments, the pricing management department, then order handling or something, maybe they have some more complicated things to do, but I think their attitude is more important than... the soft skills are more important.”
[P1]

IT skills are not required; tools are not a challenge anymore

“These tools are easy to use, IT skills are not required.” [P2]

“I would say that in in our case, our business people are capable to use this IT tools very, very nicely and, and you know, especially the younger generation, they are using all these things much much better than I will do ever. My reference here is that if I can do it, then everyone can. I would say so, of course, it is a key and the role, but it's not a challenge anymore. Everyone knows enough to use this tool.”
[P4]

4.4 Performance outcomes (organizational performance)

As mentioned previously, BI impacts on firm performance are measured following the perception-based measurements. These measures include sales increase, product innovation, cost reduction, customer relationship improvement, increased learning, and improved decision making. The findings are presented below.

To get a general perspective on the impact of BI systems on organizational performance, the participants were asked about the way(s) BI system has improved performance in their respective organizations.

Unified and simplified processes; visible process

"I would say it's unifying the processes, it's simplifying the processes, it's making everything visible. So I think that's the main pillars for that." [P1]

More sales, revenues

"We don't miss any opportunity. Well, when they are in a system, we will follow with them, we can come back, hey, this is something we have, you know, forgotten. And we have to go back and you know, contact the customer again. So, yes, it's improving our IT and it's already improved our performance leading to more sales or more revenue." [P4]

Prediction of future trends

"It has helped to predict future trends. It has helped increase sales for example if you want to compare with past performance, industry average." [P2]

Timely decision making

"We are now more aware what is going on and what is waiting behind the corner. This helps a lot for making right timing decisions." [P3]

For the purpose of clarity and comparison, findings on the impact of the effective use of BI system on firm performance are presented in table 4 below.

Table 4. Impact on firm performance.

Measurement items		Impact	No impact
Increased sales	P1	✓	
	P2	✓	
	P3	✓	
	P4	✓	
Enhanced product innovation	P1	✓	
	P2		✓
	P3	✓	
	P4	✓	
Reduced cost	P1	✓	
	P2	✓	
	P3	✓	
	P4	✓	
Improved customer relationship	P1	✓	
	P2	✓	
	P3	✓	
	P4	✓	
Increased learning	P1	✓	
	P2	✓	
	P3	✓	
	P4	✓	
Improved decision making	P1	✓	
	P2	✓	
	P3	✓	
	P4	✓	

Figure 11 shows the rate of satisfaction on the use of BI system by participants.

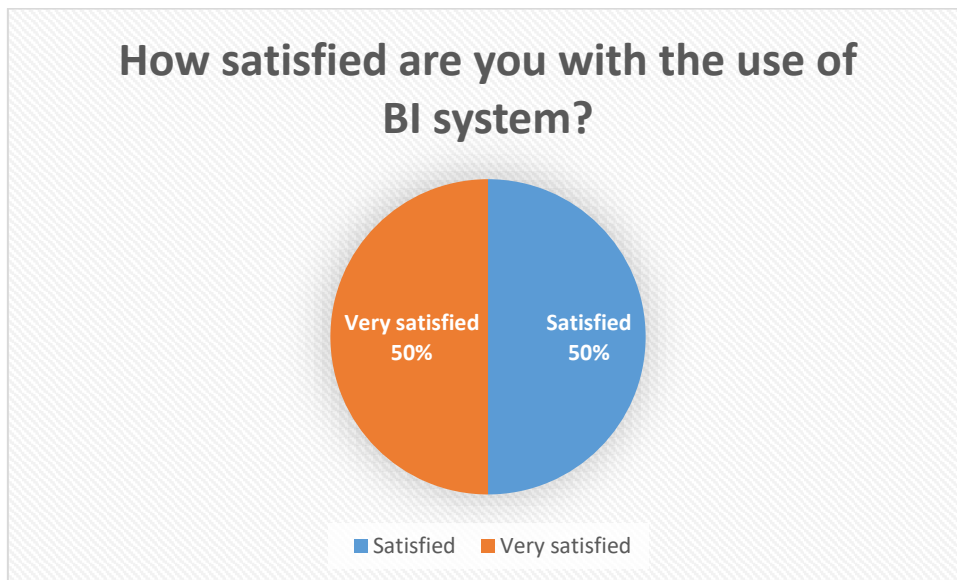


Figure 11. Use of BI system

5 CONCLUSION

This concluding chapter presents the summary of key findings of the study, the theoretical contributions, managerial implications, future research suggestions, and the limitations of the study.

5.1 Summary of key findings

Managing customer relationships is a vital part of business operations. It is widely believed and has been proven that customers are the most important assets of any profit-making organization. Therefore, companies around the world employ various means through which these supposedly vital assets are kept and maintained. One of such means is the use of technological tools like the BI system. Consequently, it is imperative to understand the impact of the effective use of BI systems on organizational performance and what drives the effective use of this IT tool. In addition, measuring the business value of the BI system is necessary given its huge investments (Elbashir et al., 2008). Thus, the purpose of this study was to investigate the factors that enhance the use of BI system for managing customer relationship and examine its impact on firm performance using the effective use theory and the business process performance framework. Based on that, the research question of this thesis was formed as follows:

“What are the drivers and performance outcomes of effective use of BI system for managing customer relationships?”

Having described the intended purpose and the research question of this study, the summary of the findings will be presented in the subsequent paragraphs based on the research sub-objectives outlined in the study.

RsO-1: To increase understanding about the conceptualization and role of CRM, types of BI systems for CRM, their implementation process, and benefits of effective usage.

It is widely believed that CRM has no universal definition. However, Zablah et al. (2004)'s categorization of CRM presents a clear understanding of the conceptualization of CRM over the years. According to the authors, CRM can be seen from five different perspectives: process, strategy, philosophy, capacity, and technology. While these concepts are unique in their own way, CRM as a strategy provides a clearer understanding of the ultimate goal of the CRM process (Zablah et al., 2004). It is on that basis that the conceptualization and the role of CRM was established in this study. Further, this study identifies the types of BI system for CRM as enterprise and functional BI (Arnott, Lizama & Song, 2017). While the enterprise BI is deployed across various divisions, the functional BI is deployed to a single unit. Since BI system is regarded as a huge investment, attention must be paid, and careful considerations must be given to the critical success factors (CSFs) for BI systems implementation in order to achieve success. Though the benefits of the use of BI system are difficult to measure (Keen, 1981; Lönnqvist & Pirttimäki, 2006; Elbashir et al., 2008) due to their qualitative and intangible nature (Keen, 1981; Watson et al., 2002; Lönnqvist & Pirttimäki, 2006; Elbashir et al., 2008; Sparks & McCann, 2015), it is argued that the effective use of BI systems results in business value increase, cost reduction, and synergies (Dinter, 2013).

RsO-2: To explore the determinants of effective use of BI system at both organizational and user levels.

Following an extensive literature review on the CSFs of CRM and BI systems implementation, this study proposed eight determinants of the effective use of BI system, which were examined at two levels: organizational and user. It is important to state that there are no previous studies regarding the determinants of effective use of BI system

considered at both organizational and user level. At the organizational level, this study reveal that top management support and commitment, well defined vision and goals, organizational culture, and BI capabilities drive the effective use of BI system in managing customer relationships. At the user level, this research shows that employee commitment, soft skills, self-efficacy are drivers of the effective use of BI system. Although basic IT skills are needed, they are not important as modern tools are user-friendly. Certainly, the findings show that the user level determinants are *behavioural* or *attitudinal*.

Interestingly, the findings of this study reveal that other drivers of the effective use of BI system for managing customer relationships are well defined goals, vision and objectives; motivated employees; successful examples; BI functionality; BI value and perceived benefits. *BI functionality* and *BI value* were not included in this study because they are *IS level factors*.

RsO-3: To increase understanding about conceptualization and measurement of firm performance.

Traditionally, firm performance is assessed based on profitability (Morgan & Strong, 2003). In spite of the absence of a universal definition, firm performance as a concept has evolved over time. Contemporary researchers have argued for the consideration of other non-financial indicators (Venkatraman & Ramanujan, 1986; Richard et al., 2009; Raguseo & Vitari, 2018) when assessing the performance of a firm. Going by that, one model that can be used to measure firm performance is the BSC developed by Kaplan and Norton (1992). This model provides an avenue for managers to assess their company's performance despite its criticism.

RsO-4: To investigate the impact of effective use of BI system on firm performance.

It is worthy to note that the impact of the effective use of BI system on firm performance can be measured using the perception-based measurements (Elbashir et al., 2008). Based on the findings of this studies, the use of BI system leads to improved decision making. This is consistent with the findings of Ahonen (2017). The findings also reveal that the effective use of BI system leads to increased learning and improved customer relationship. The finding on increased learning is consistent with previous studies on the impact of BI system on firm performance by Pääkkönen (2015) and Hou (2016). On improved customer relationship, the finding is consistent with Hou (2016). However, it is important to emphasise that there are no noticeable previous studies consistent with the findings on increased sales, enhanced product innovation, and reduced cost. According to the findings of this study, the effective use of BI system leads to increased sales, enhanced product innovation, and cost reduction. The effective use of BI system can also help companies in the manufacturing industry to innovate as future trends can be predicted. Generally, based on the findings of this study, some of the ways through which BI system can improve organization performance are (i) business process improvement (ii) sales and revenue increase (iii) timely decision making (iv) future trends prediction. In terms of usage in the two categories of the case companies, empirical findings suggest that there are no noticeable differences in the deployment and usage of the BI system.

On the whole, based on the findings of this study, the proposed theoretical framework of this study is revised and presented below in figure 12.

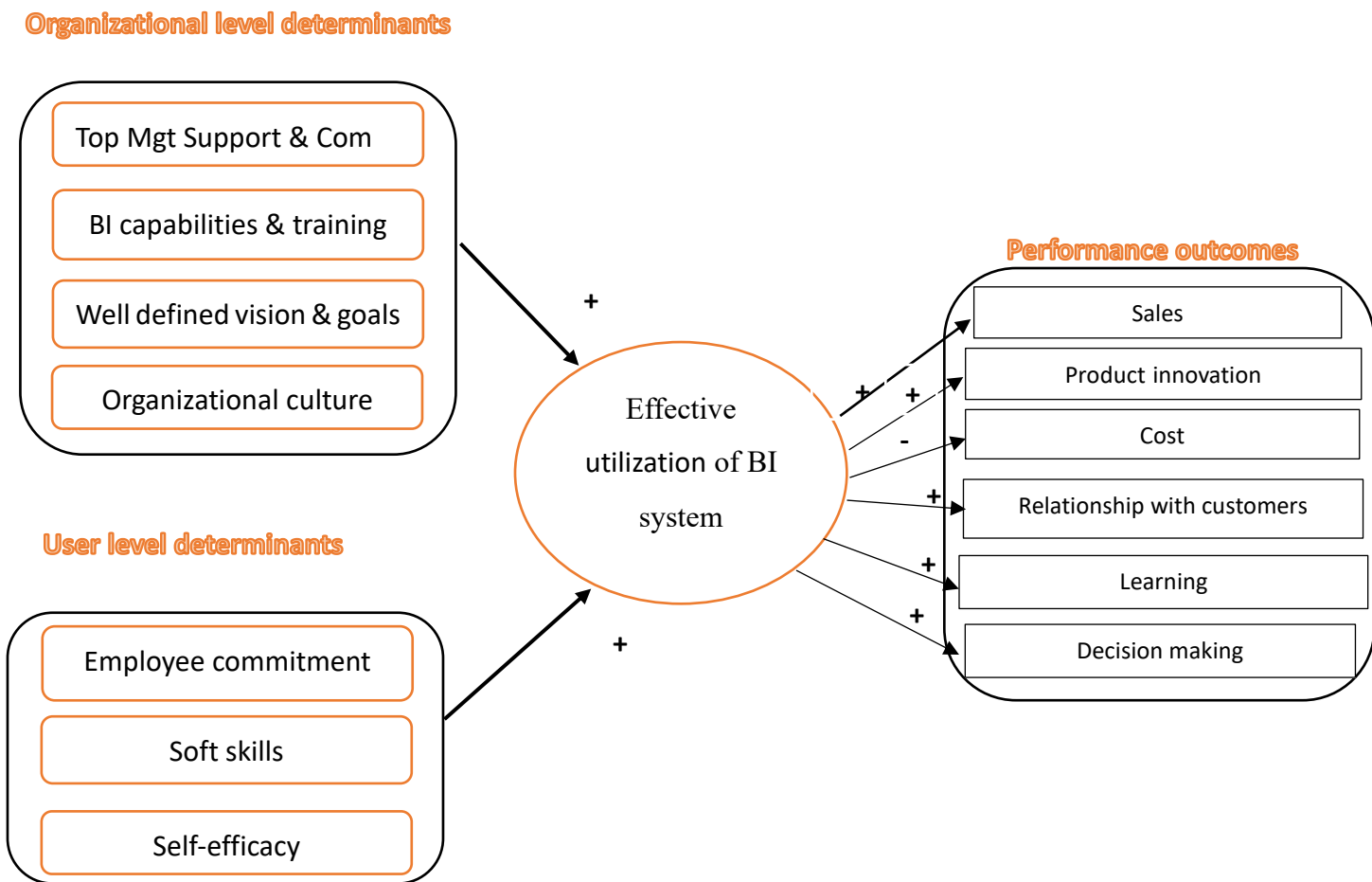


Figure 12. Drivers and performance outcomes of the effective use of BI system for managing customer relationships (own illustration).

5.2 Theoretical contribution

This research aimed to study the drivers and performance outcomes of the effective use of BI system for managing customer relationships. The study explored the factors that help drive the effective use of BI system in the context of the BI use process. Apparently, it is important to state that there are no prior studies on the drivers of the effective use

of BI system for managing customer relationships. Previous studies have shown that researchers have not paid much attention to how organizations can obtain specific business value from the BI system (Trieu, 2017), despite the enormous potentials the IT tool possesses. While a review of existing research in BI literature shows some progress in studies relating to BI impacts and BI assets, the effective use of BI system has not received attention. Thus, this study has exploited the existing research gap to increase knowledge in the BI business value research domain. Specifically, this research has contributed to the understanding of the factors that drive the effective use of BI systems for managing customer relationships, which has received no prior attention by researchers.

In addition, the focus on the BI use process has contributed to the understanding of BI impacts on firm performance. The concept of firm performance has evolved over time. Thus, this research has increased understanding in the concept and measurement of firm performance. Though perception-based data can be subjective, this study has further proven that perception-based measurements provide important insights relating to the performance outcomes of the effective use of the BI system. This claim corroborates Elbashir et al. (2008)'s previous study on the measurement of BI systems' business value. The study has also addressed the "user-related factors" as highlighted by Ain et al. (2019). Ultimately, this research creates new knowledge in the area of drivers and performance outcomes of BI system use for managing customer relationships.

5.3 Managerial implications

The emergence of big data gives credence to the importance of managing individual customer according to their needs and preferences, thereby improving customer satisfaction. It is important to note that customers are better positioned these days to make informed choices due to the level of information available on the internet and the proliferation of multiple channels of communication. Staying ahead of the competition requires taking proactive actions and making strategic and well-informed decisions. According to Ain et al. (2019), Business intelligence system "is an information system that

supports decision processes” through specialised functions such as the processing of “unstructured and structured data for data analysis, ad hoc queries, reporting and forecasting”. Going by that explanation, it is important for organizations to ensure the effective utilizations of BI system to improve business process performance.

Since it is important for businesses to monitor their performances so as to increase shareholder value, this research has contributed to the understanding of how businesses can effectively use the BI system to improve business process performance in order to attain their business goals. Organizations must show commitment and offer top management support towards the effective use of BI system. Research have shown that this is an important factor in the implementation and utilization of BI systems (Wixom & Watson, 2001; Yeoh & Koronios, 2010; Kulkarni, Robles-Flores, & Popovič, 2017; Farhan et al., 2018). The support of the management ensures the accomplishment of business goals (Yeoh & Koronios 2010; Dinter, 2013). However, these goals and vision must be well defined. BI systems fail to give the desired results when there are not clearly defined goals (Yeoh & Koronios, 2010). Since customer satisfaction is the goal of any business, managers must ensure that there are clearly defined business goals in order to get the best out of the BI system.

Managers should take practical steps to ensure a change in organizational culture from product-centric to customer-centric. Imbibing this culture will help businesses understand their customer’s needs and be able to serve them better. A data-driven culture is necessary in this regard. Moreover, BI business value can be better harnessed through a data-driven organizational culture (Ain et al., 2019). One way to achieve this is through a change management program for employees (Zerbino et al., 2018). To fully exploit the BI system capabilities, Managers must do an internal assessment of the company’s human resources to determine if they have the required individuals to manage the BI system. Managers can bring in competent individuals if there are none. Management can also offer trainings and develop the capabilities of their employees to actualize their business objectives. It is important for them to show support and ensure that employees

are well motivated. BI system users, on other hand, must show commitment to the BI systems objectives. They are expected to develop the desired mind-set for the use of BI system in order to achieve the intended outcomes. Results have shown that leadership, interpersonal or behavioural skills are important when managing customer relationships. BI system users should be aware of this. Moreover, self-efficacy is required in putting these skills to best use consistently in order to achieve the intended outcomes.

5.4 Research limitations and future research suggestions

This research has some limitations which are noteworthy and will provide direction for future research. Firstly, there is a limitation to the broader application of this study. This study is a qualitative study, and the sample size is relatively small. Thus, the generalizability of the research findings may not be deemed appropriate to a larger audience. A quantitative study and a larger sample size could be considered when conducting future research in this research domain. In addition, the research participants were located in the same country and working in the same industry as at the time of conducting this research. Consequently, future research could consider participants from other locations and other industries using the BI system for managing customer relationships.

Secondly, the research considered four drivers each of the effective use of BI system at the organizational and user level. It is important to note that there may be other drivers (determinant) of the effective use of BI system which this study did not consider. Future research may widen the scope to consider additional determinants of the effective use of BI system as these factors may evolve over time. This can provide new insights into what drives the effective use of BI system for managing customer relationships. Further, this study combines the drivers and performance outcomes. Future research could focus on one variable at a time.

Thirdly, the measures used in this study for firm performance were subjective perceptual measures. This was considered based on the belief that manager's perceptions were the

most appropriate for the study as objective measures are mostly deemed as classified company data and not generally available to the public. Future research could conduct statistical tests in order to limit any threats to data quality in the research (Elbashir et al., 2008).

Lastly, the research approach of this study was based on the theory of effective use, in which the determinants were examined at two levels. Further research could extend the theory.

References

- Achmad, F. H., & Cantner, U. (2018). Soft skills, hard skills, and individual innovativeness. *Eurasian Business Review*, 8(2), 139-169. doi:<http://dx.doi.org.proxy.uwasa.fi/10.1007/s40821-017-0076-6>
- Agarwal, R. & V. Dhar (2014). Editorial: Big data, data science, and analytics: the opportunity and challenge for IS research. *Information systems research : ISR ; an information systems journal of the Institute for Operations Research and the Management Sciences*, 25(3), pp. 443-448.
- Ahonen, I. (2017). Perceived usefulness of business intelligence system in decision making process Jyväskylä.
- Ain, N., Vaiaa, G., DeLone W. H. & M. Waheed (2019). Two decades of research on business intelligence system adoption, utilization and success – A systematic literature review. *Decision Support Systems*, 125, . doi:10.1016/j.dss.2019.113113
- Al-hadad, Y. & R. D. Zota (2016). Implementing Business Intelligence System - Case Study, *Database Systems Journal, Academy of Economic Studies - Bucharest, Romania*, 7:1 [online] [cited 2019-09-16], 35-44. Available from Internet: <URL:http://www.dbjournal.ro/archive/23/23_5.pdf>
- Arnott, D., Lizama, F., & Y. Song (2017). Patterns of business intelligence systems use in organizations. *Decision Support Systems*, 97, 58-68. doi:10.1016/j.dss.2017.03.005
- Audzeyeva, A. & R. Hudson (2016). How to get the most from a business intelligence application during the post implementation phase? Deep structure transformation at a U.K. retail bank. *European Journal of Information Systems*, 25(1), pp. 29-46. doi:10.1057/ejis.2014.44
- Aydiner, A. S., Tatoglu, E., Bayraktar, E. & Zaim, S. (2019). Information system capabilities and firm performance: Opening the black box through decision-making

- performance and business-process performance. *International journal of information management*, 47, pp. 168-182. doi:10.1016/j.ijinfomgt.2018.12.015
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 84(2), pp. 191-215. doi:10.1037/0033-295X.84.2.191
- Barney, J. (1991). Firm Resources and Sustained Competitive Advantage. *Journal of Management*, 17(1), pp. 99-120. doi:10.1177/014920639101700108
- Brijs, Bert (2013). *Business Analysis for Business Intelligence*. Boca Raton: CRC Press
- Boyne, G., Meier, K., O'Toole, L. J. & Walker, R. (2006). *Public service performance: Perspectives on measurement and management*. New York: Cambridge University Press
- Burton-Jones, A. & C. Grange (2012). From Use to Effective Use: A Representation Theory Perspective. *Information Systems Research*, 24(3), pp. 632-658. doi:10.1287/isre.1120.0444
- Cambra-Fierro, J. J., Centeno, E., Olavarria, A & R. Vazquez-Carrasco (2017). Success factors in a CRM strategy: technology is not all. *Journal of Strategic Marketing*, 25:4, 316-333. doi: 10.1080/0965254X.2016.1148760
- Carmines, E. G. & Zeller, R. A. (1979). Introduction. In *Reliability and validity assessment* (pp. 9-16). SAGE Publications, Inc., <https://www-doi-org.proxy.uwasa.fi/10.4135/9781412985642>
- Churchill, G. (1979). A Paradigm for Developing Better Measures of Marketing Constructs. *Journal of Marketing Research*, 16(1), 64-73. doi:10.2307/3150876
- Clark, T., M. C. Jones & C. P. Armstrong (2007). The dynamic structure of management support systems: Theory development, research focus, and direction. *Mis Quarterly*, 31(3), pp. 579-615. doi:10.2307/25148808

- Deng, X. & L. Chi (2012). Understanding Postadoptive Behaviors in Information Systems Use: A Longitudinal Analysis of System Use Problems in the Business Intelligence Context. *Journal of Management Information Systems*, 29(3), pp. 291-326. doi:10.2753/MIS0742-1222290309
- Dinter, B. (2013). Success factors for information logistics strategy — An empirical investigation. *Decision Support Systems*, 54(3), . doi:10.1016/j.dss.2012.09.001
- Dyché, J. (2001). *The CRM handbook: A business guide to consumer relationship management*. Boston: Addison-Wesley.
- Elbashir, M. Z., Collier, P. A. & M. J. Davern (2008). Measuring the effects of business intelligence systems: The relationship between business process and organizational performance. *International Journal of Accounting Information Systems*, 9(3), pp. 135-153. doi:10.1016/j.accinf.2008.03.001
- Farhan, M. S., Abed, A. H. & M. A. Ellatif (2018). A systematic review for the determination and classification of the CRM critical success factors supporting with their metrics. *Future Computing and Informatics Journal*, 3(2), pp. 398-416. doi:10.1016/j.fcij.2018.11.003
- Golafshani, N. (2003). Understanding reliability and validity in qualitative research. (Report). *The Qualitative Report*, 8(4), 597.
- Gupta, Y., & N., Sharma (2013). When BI Meets CRM: An Emerging Concept in Retail Industry. *International Journal of Business Analytics and Intelligence*, 1(1), pp. 41-48.
- Hawking, P. & C. Sellitto (2010). *Business Intelligence (BI) critical success factors*.
- Hou, C. (2016). Using the balanced scorecard in assessing the impact of BI system usage on organizational performance: An empirical study of Taiwan's semiconductor industry. *Information Development*, 32(5), pp. 1545-1569. doi:10.1177/0266666915614074

- Jiménez-Jiménez, D. & Sanz-Valle, R. (2011). Innovation, organizational learning, and performance. *Journal of Business Research*, 64(4), pp. 408-417. doi:10.1016/j.jbusres.2010.09.010
- Kaplan, R. S. & Norton, D. P. (1992). The balanced scorecard--measures that drive performance. *Harvard business review*, 70(1), p. 71.
- Kirk, J. & Miller, M. L. (1986). Reliability and validity. In *Reliability and validity in qualitative research* (pp. 14-21). SAGE Publications, Inc., <https://www-doi-org.proxy.uwasa.fi/10.4135/9781412985659>
- Kotler, P. (2004). Getting better at consumer marketing. In: *Managing customer relationships*. Ed. Don Peppers & Martha Rogers. Hoboken, New Jersey: John Wiley & Sons.
- Kulkarni, U., Robles-Flores, J. A., & Popovič, A. (2017). Business intelligence capability: The effect of top management and the mediating roles of user participation and analytical decision making orientation. *Journal of the Association for Information Systems*, 18(7), 516-541. <https://doi.org/10.17705/1jais.00462>
- Li, X., Po-An Hsieh, J. J. & A. Rai (2013). Motivational Differences Across Post-Acceptance Information System Usage Behaviors: An Investigation in the Business Intelligence Systems Context. *Information Systems Research*, 24(3), pp. 659-682. doi:10.1287/isre.1120.0456
- Lin, Y. & Wu, L. -. Y. (2014). Exploring the role of dynamic capabilities in firm performance under the resource-based view framework. *Journal of Business Research*, 67(3), p. 407.
- Maheshwari, A. (2014). *Business intelligence and data mining*. Retrieved from <URL:<https://ebookcentral-proquest-com.proxy.uwasa.fi>>

- Makkonen, H., Pohjola, M., Olkkonen, R. & Koponen, A. (2014). Dynamic capabilities and firm performance in a financial crisis. *Journal of Business Research*, 67(1), pp. 2707-2719. doi:10.1016/j.jbusres.2013.03.020
- Meyer, J. & Herscovitch, L. (2001). Commitment in the workplace: Toward a general model. *Human Resource Management Review*, 11(3), 299. [https://doi.org/10.1016/S1053-4822\(00\)00053-X](https://doi.org/10.1016/S1053-4822(00)00053-X)
- Miller, C., Washburn, N., Glick, W. & . (2013). PERSPECTIVE—The Myth of Firm Performance. *Organization Science*, 24(3), pp. 948-964. doi:10.1287/orsc.1120.0762
- Morgan, R. E. & Strong, C. A. (2003). Business performance and dimensions of strategic orientation. *Journal of business research*, 56(3), pp. 163-176. doi:10.1016/S0148-2963(01)00218-1
- Norreklit, H. (2000). The balance on the balanced scorecard a critical analysis of some of its assumptions. *Management Accounting Research*, 11(1), pp. 65-88. doi:10.1006/mare.1999.0121
- Payne, Adrian (2005). *Handbook of CRM : Achieving Excellence Through Customer Management*. ProQuest Ebook Central. Available from Internet: <URL:<https://ebookcentral-proquest-com.proxy.uwasa.fi/lib/tritonia-ebooks/detail.action?docID=255230>>
- Pääkkönen, P. (2015). The role of business intelligence for internationalization and organizational learning, Oulu.
- Peppers, D. & Rogers, M. (2004). *Managing customer relationships: A strategic framework*. Hoboken, New Jersey: John Wiley & Sons.
- Popova-Nowak, I. V., & Cseh, M. (2015). The Meaning of Organizational Learning: A Meta-Paradigm Perspective. *Human Resource Development Review*, 14(3), 299–331. <https://doi.org/10.1177/1534484315596856>

- Priem, R. & Butler, J. (2001). Is the resource-based "view" a useful perspective for strategic management research? *Academy Of Management Review*, 26(1), pp. 22-40. doi:10.5465/AMR.2001.27879279
- Raguseo, E. & Vitari, C. (2018). Investments in big data analytics and firm performance: An empirical investigation of direct and mediating effects. *International Journal of Production Research*, 56(15), pp. 5206-5221. doi:10.1080/00207543.2018.1427900
- Richard, P. J., Devinney, T. M., Yip, G. S. & Johnson, G. (2009). Measuring Organizational Performance: Towards Methodological Best Practice. *Journal of management*, 35(3), pp. 718-804. doi:10.1177/0149206308330560
- Santhanam, R. & E. Hartono (2003). Issues in linking information technology capability to firm performance (1). (Research Note). *MIS Quarterly*, 27(1), p. 125. doi:10.2307/30036521
- Santos, J. B. & Brito, L. A. L. (2012). Toward a subjective measurement model for firm performance. *BAR - Brazilian Administration Review*, 9(spe), pp. 95-117. doi:10.1590/S1807-76922012000500007
- Saunders, M., Lewis, P. & Thornhill, A. (2009). *Research methods for business students* (5th ed.). Harlow: Prentice Hall.
- Shollo, A., & Kautz, K. (2010). *Towards an Understanding of Business Intelligence*. Paper presented at Australasian Conference on Information Systems: ACIS 2010, Brisbane, Australia.
- Silverman, D. (2011). *Qualitative research* (5. ed.). SAGE.
- Sparks, B. H. & McCann, J. T. (2015). Factors influencing business intelligence system use in decision making and organisational performance. *Int. J. of Sustainable Strategic Management*, 5(1), . <https://doi.org/10.1504/IJSSM.2015.074604>

- Taouab, O. & Issor, Z. (2019). Firm Performance: Definition and Measurement Models. *European Scientific Journal*, 15(1), p. 93. doi:10.19044/esj.2019.v15n1p93
- Teece D., Pisano G. (2003) The Dynamic Capabilities of Firms. In: Holsapple C.W. (eds) Handbook on Knowledge Management. International Handbooks on Information Systems, vol 2. Springer, Berlin, Heidelberg. https://doi.org/10.1007/978-3-540-24748-7_10
- Torres, Russell & Sidorova, Anna & Jones, Mary. (2018). Enabling Firm Performance through Business Intelligence and Analytics: a dynamic capabilities perspective. *Information & Management*. 55. 10.1016/j.im.2018.03.010.
- Trieu, V. (2017). Getting value from Business Intelligence systems: A review and research agenda. *Decision Support Systems*, 93, pp. 111-124. doi:10.1016/j.dss.2016.09.019
- Venkatraman, N. & Ramanujam, V. (1986). Measurement of Business Performance in Strategy Research: A Comparison of Approaches. *The Academy of Management Review*, 11(4), pp. 801-814. doi:10.2307/258398
- Venkatraman, N. & Ramanujam, V. (1987). Measurement of Business Economic Performance: An Examination of Method Convergence. *Journal of Management*, 13(1), pp. 109-122. doi:10.1177/014920638701300109
- Watson, H. J., Wixom, B. H., Hoffer, J. A., Anderson-Lehman, R. & A. M. Reynolds (2005). Real-Time Business Intelligence: Best Practices at Continental Airlines. *Information Systems Management*, 23(1), pp. 7-18. doi:10.1201/1078.10580530/45769.23.1.20061201/91768.2
- Weber, M., Finley, D., Crawford, A. & Rivera, D. (2009). An exploratory study identifying soft skill competencies in entry-level managers. *Tourism and Hospitality Research*, 9(4), 353-361. <https://doi.org/10.1057/thr.2009.22>
- Williams, D. (2014). *Connected CRM: Implementing a big-data-driven, customer-centric business strategy*. Hoboken, New Jersey: John Wiley & Sons, Inc.

- Wood, R. & Bandura, A. (1989). Social Cognitive Theory Of Organizational Management. Academy of Management. *The Academy of Management Review*, 14(3), p. 361. doi:10.2307/258173
- Yasmin, M., Tatoglu, E., Kilic, H. S., Zaim, S. & Delen, D. (2020). Big data analytics capabilities and firm performance: An integrated MCDM approach. *Journal of business research*, 114, pp. 1-15. doi:10.1016/j.jbusres.2020.03.028
- Yeoh, W., & Koronios, A. (2010). . Critical Success Factors for Business Intelligence Systems. *Journal of Computer Information Systems*, 50(3), pp. 23-32. doi:10.1080/08874417.2010.11645404
- Zablah, A. R., Bellenger, D., & W. Johnson (2004). Customer Relationship Management Implementation Gaps. *Journal of Personal Selling & Sales Management*, 24(4), pp. 279-295. doi:10.1080/08853134.2004.10749038
- Zerbino, P., Aloini, D., Dulmin, R. & Mininno, V. (2018). Big Data-enabled Customer Relationship Management: A holistic approach. *Information Processing & Management*, 54(5), 818. <https://doi.org/10.1016/j.ipm.2017.10.005>

Appendices

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Appendix 1. Semi-structured interview questionnaire

Appendix 2. Informed consent