

EFFECT OF E-CRM ON PORT PERFORMANCE THROUGH CUSTOMER SATISFACTION AND CUSTOMER LOYALTY THE CASE STUDY OF MENA REGION PORTS

Ahmed Kamal^{1*}

Supervisor

Prof. Dr. Mohamed Abdel Salam², Prof. Dr. Islam Elnakib³

**Corresponding Author:-*

Abstract

Adoption of e-CRM has been a recent strategy in the majority of business organizations, more particularly the developing countries, and, as such, managers have strategically invested in online technologies while emphasizing the building and maintaining of worthy linkages with profitable customers. This study aims at identifying the role of CRM in enhancing port performance in regard to customer satisfaction and customer loyalty in MENA ports context. A quantitative research approach through use of questionnaire survey is used to answer the research questions and achieve the objectives of the study. Egyptian port customers and employees are used as the case study of the research for data collection, a total 403 valid questionnaires are collected from users of MENA ports, analysis and findings. Descriptive statistics is used to describe the findings and regression analysis used to describe and evaluate the relationship between the constructs. Finally, the results indicate that there is a positive relationship between E-CRM implication and port performance. Also, there is a positive relationship between E-CRM implication and customer satisfaction as well as customer loyalty. In addition, the relationship between customer satisfaction and customer loyalty is positive and statistically significant. Therefore, both customer satisfaction and customer loyalty have a positive impact on port performance as well. Moreover, the research gives recommendations for top managers and decision makers to be careful to avoid mistakes in electronic communication with customers, which enhances their confidence in this type of communication, and encourages them to use and benefit from it.

LIST OF ABBREVIATIONS

API	Application Programming Interface
AVE	Average Variance Extracted
BI	Business Intelligence
CRM	Customer Relationship Management
E-CRM	Electronic Customer Relationship Management
ERP	Enterprise Resource Planning
FAQ	Frequently Asked Question
FL	Factor Loading
GDP	Gross Domestic Product
IBM	International Business Machines
IVR	Interactive Voice Response
MENA	Middle East and North Africa
OLAP	Online Analytical Processing
PA	Port Authorities
PDA	Personal Digital Assistant
PSQ	Port Service Quality
ROI	Return on Investments
SBI	State Bank of India
SEM	Structural Equation Modelling
SPSS	Statistical Package for Social Sciences
STEM	Science, Technology, Engineering and Mathematics
TCF	Transaction Cycle Framework
TEU	Twenty-Foot Equivalent Unit

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CHAPTER ONE

INTRODUCTION

1.1 Overview

As aforementioned, this study aims at identifying the role of CRM in enhancing port performance in regard to customer satisfaction and customer loyalty in Egypt ports context. To this effect, this study will explore and critically evaluate both previous theoretical and empirical studies related to the subject matter to: provide a background of the research topic; create context for this study; show how this study fits into the existing body of knowledge and reveal gaps that this study will address. Therefore, this chapter and the subsequent one will build on the first chapter by conducting a literature review.

1.2 Background and Justification

Port rivalry has become so intense and a multi-faceted concept. This rivalry has been fueled by continuous changes in the ports and shipping industry leading to increased competition among ports locally, nationally, regionally and internationally (Notteboom & de Langen, 2015). Notteboom and Rodrigue (2017) stated a successful port must be prepared to constantly adapt and cope to these new changes. Additionally, Singh and Saini (2016) stated that a firm faced with tight competition needs to constantly monitor their customer's feelings towards the organization's services and propose relationship marketing as the means to securing competitive edge in the market. The author's findings showed that the relationship concept is dependent on how and where people exchange information both internally and externally. Therefore, an effort to foster how effectively Egypt ports management can establish and maintain customer centric and market driven strategies has engineered this study on CRM.

CRM concept is considered a paradigm shift taking place in marketing transforming service marketing to customer-based marketing (Kumar and Reinartz, 2018). The authors emphasize on the organization's need to update their processes and practices to align with customer's concept so as to remain relevant and accountable to their customers and to stakeholders. A body of studies on CRM has been conducted on service industries comprising of hotels, hospitals, banks (Mohammed and Rashid, 2012; Sadek et al. 2012). However, very few have been conducted in the shipping industry and more so in ports (Pereira et al., 2017). Studies undertaken in ports mostly focus on port service quality and customer satisfaction (Yeo et al., 2015).

Increased globalization has seen to ports taking up new roles as dynamic business networks (van der Lugt et al., 2017) and diminishing the traditional roles as simply an exchange point for people and cargo from land to sea and vice versa. Song and Parola (2015) and Van Der Lugt et al. (2013) affirmed this by stating that ports act as network in which each business competitiveness success is tightly connected to. Therefore, as global business network, port's global value proposition largely depends on its ability to develop its competencies, resources and capabilities (Parola et al., 2017) in a way that satisfies its customers.

Statistics show that over the last four decades' port industry especially container hub ports have experienced significant changes. This is evidenced by Asian ports overtaking the European and American ports and ranking in top positions in the world container rankings (Lee & Lam, 2015). This wave of change is expected to escalate and trickle down to Africa as port investors seek to invest in regions with lower operating costs.

Some of the contributing factors to this shift of power include changes of production and distribution channels, city port interface, port governance, technology, customer's behavior, environmental issues, safety and security, pricing among others (Lee & Lam, 2015). These unfolding changes have intensified level of port competition to unimaginable levels. (Jugović et al., 2017) state that ports are exposed to three kinds of competition: Inter-port, intraport and inter-port competition at the port authority level for instance ports sharing the same coast line, ports in different countries or at national level. Therefore, ports need to devise strategies which can improve their competitive edge through provision of high-quality services, improved customer value and satisfaction and efficient port performance as indicated in figure so as to remain relevant in the maritime transport. Figure 1-1 shows the efficient process of ports for export and import in international trade.

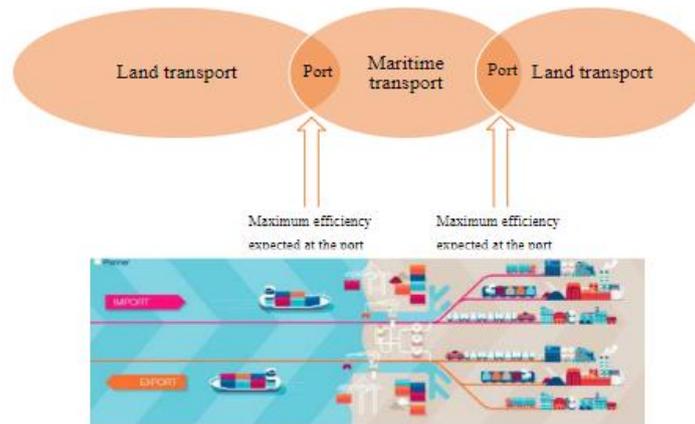


Figure 1- 1: Efficiency of ports in international trade

Source: Deloitte (2018)

Today's customer continuously demands for efficient services at lower cost so as to reduce their business operating costs and maximize profits. As such, Port Authorities (PA) are under immense pressure to improve their levels of efficiency and performance so as to meet their customer's and shareholder's expectations. (Cheon et al., 2018) emphasize that ports faced with competitive pressure have strong incentive to invest in innovative cargo handling technology so as to minimize operating costs. However, these investments are costly thus port management is torn between efficiently meeting ports user's needs and recouping sufficient return on investments (ROI) for its shareholders.

In regard to this, ports are forced to adopt a business marketing perspective which enables it to efficiently meet its customer's needs while promising a positive ROI. Therefore, managing beneficial customer relationships becomes an important element as it enhances customer satisfaction through provision of quality services and enhanced customer value. The ideal philosophy behind is to differentiate ports services from its competitors by adding value to the services since ports offer homogenous services.

1.3 Port trends General

Global trends in the ports & shipping industry to 2030 according to (Deloitte, 2018):

1. Globalization, demographic growth and scarcity of natural resources

Further globalization and development of the world economy are expected to trigger growth in global freight transport

- Power (economic) is shifting towards Asia. Asia's share of the world's GDP is expected to rise to more than 40% up to 2030
- Asian dominance in world shipping is expected → global trade routes will continue to change towards the Asian continent
- Ports will link Africa to Asia, getting the right regulatory framework in place to attract Asian investors will become more important
- A mismatch will arise between supply and demand in fossil energy resources, ores, water, food and minerals; the flows of raw materials from Africa will increase
- The increasing scarcity of raw resources implicates geo-economics (corresponding trade routes and investments in infrastructure)
- Urbanization trend implies ports have to be stronger connected to the larger cities, high-speed rail link proposed between Johannesburg and Durban prime example

2. Energy transition and bio-based economy

The share of renewable energy is increasing and the efficiency of solar energy is rapidly increasing

- The number of hybrid and fully electric cars is growing; limiting the need for transportation fuels
- The number of biofuels will increase, bio based chemical products will develop fast
- Importance of middle distillates and gas in fueling ocean and inland shipping will increase sharply
- The changing mix of fuels brings opportunities: new cargo flows such as LNG, biomass and
- It also implies threats: a decline in mineral oil products used as transportation fuels, and local energy generation for the port

3. Digitalization of logistics

The future is technology; technology will radically change the way logistics are organized Digitalization of logistics

- Logistics are becoming more complex, therefore an increasing need to digitalize the information streams
- Digitalization will allow for optimization of current existing infrastructure, reducing the need to invest in additional infrastructure
- Possibility to eliminate unnecessary (empty) transport
- Data analytics and data exchange becoming a new comparative advantage for ports
- Self-steering ships will become the standard
- The usage of sensors will replace the need for towing

- The usage of drones for inspection will increase efficiency

4. Additive manufacturing (3D printing)

3D printing potentially removes the need for shipping Additive manufacturing

- The size of the market, including 3D printer sales, materials and associated services, reached US\$3.8 billion in 2014. The market is continuing to experience rapid growth, reaching US\$16.2 billion by 2018. This represents an expected compound annual growth rate (CAGR) of 45.7% from 2014 to 2018
- 3-D Printing is already enabling some manufacturers to 'next-shore' and remove the need for shipping at all
- It is driving manufacturers towards the goal of zero-inventory
- It is going to transform the way that ships are supplied in the future – cargo streams will most likely differ: more shipment of raw materials rather than end products
- As trade patterns alter, new opportunities will emerge to service new manufacturing requirements to ship materials out for recycling and refurbishment

5. Security

The ability of hackers to remotely control port operations is the new “hole in the fence” of port security

- The use of various control systems and increasing automation in general in the port will reduce the risk of human errors and automation increases reliability of the system; limiting the number of delays
- However, technology also has a dark side: cybersecurity and cyber-resilience are becoming more important as a parallel development to automation
- Be prepared to deal with existing and emerging cyber threats from criminals, terrorists and enemy nation states that could shut down large pieces of the country’s critical maritime transportation system
- Drug dealers shut down IT security more easily
- This preparation is not just technological – it requires building a risk-aware culture

6. Knowledge intensive labor market

The war on talent is focusing on STEM profiles Knowledge intensive labor market Knowledge and innovation will become increasingly dominant factors in determining the competitive strength of the port

Science, Technology, Engineering and Mathematics (STEM) students will become more and more sought after

- Competition for skilled employees is increasing and as a result the (port) labor market will further internationalize in the next few years
- Western shipping companies facing this shortage of talent will look for Asia and Africa to secure their human capital
- Mismatch between high (youth) unemployment and lack of skilled workers is a social change

7. Further integration of supply chains A chain is only as strong as its weakest link

- Further integration of supply chains
- Connections to the hinterland are becoming the most important asset of a port
- The role of the port authority changes, from landlord to active participant in the supply chain
- Shipping companies, logistics providers, terminal operators are becoming more global and a few players is gaining market power; implying a stronger bargaining power
- Taking positions by the port authorities in foreign ports is becoming more common – port authorities become stronger players as well
- The port authority is taking the lead in putting together a common investment agenda – most ideally with large private players in the supply chain – for the required infrastructural improvements
- More and better insight into inventory status and transport flows will help companies to further optimize their supply chains and make them more flexible – the port authority of the future is assisting

8. Increasing scale of transport

Size and capacity of ships, trains and trucks is rapidly increasing

- The trend of increasing size of ships, trains and trucks is expected to continue in the next 15 years
- The largest vessels, such as the 22,000-TEU ships which are at the design stage, can only call at a limited number of ports
- Larger ships require more depth, wider docks, stronger quays and larger cranes
- Implementing major infrastructural projects typically takes 15 years
- Transshipment is becoming more structural, the need for cooperation with other ports increases to secure optimal transport

9. Sustainability

The sustainable port, it’s not just marketing

- Environmental regulation becomes more comprehensive and more stringent
- Ports could distinguish itself more clearly from other industrial locations by focusing on energy efficiency, recycling of residual materials and carbon capture, storage and reuse – therewith promoting itself in the global landscape

1.4 Specific Trends

According to (United Nations Conference on Trade and Development, 2019) it is expected for Africa, both geography and port reforms matter. The best- connected ports in Africa are those located at the north-eastern, north-western and southern edges of the continent, i.e., ports in Morocco, Egypt and South Africa. In comparison, western African ports display relatively lower connectivity levels given their location outside the trajectory of major north-south and east-west shipping routes. Mombasa (Kenya) and Dar es Salaam (Tanzania) connect Burundi, Rwanda and Uganda to overseas markets through dedicated corridors; however, they remain highly congested.

What can be done to improve a port's connectivity? The following seven policy measures are key to enhancing port connectivity:

1. **Go digital.** Digital and physical connectivity go hand in hand. Just as trade benefits from the latest technologies such as artificial intelligence, the Internet of Things and block chain, port and shipping operations would also benefit from tapping the opportunities arising from digitalization.
2. **Link domestic, regional and global networks.** Restrictions affecting regional or domestic sabotage markets limit the ability of shipping lines to consolidate cargo. Allowing international lines to also carry domestic trade and feeding cargo can enhance both the competitiveness of the port and shippers' access to overseas markets.
3. **Ensure competition.** Considered prior analysis is required before assigning port concessions to terminal operators who are associated with shipping lines through vertical integration. On the one hand, such operators can attract port calls from associated lines and alliances. On the other, however, such vertical integration could discourage other lines from calling at the port and could limit choices available to shippers.
4. **Port modernization.** Port clients, i.e., the shipping lines and the traders, require fast, reliable and cost-efficient services to ships and cargo. Ports need to continuously invest in their technological, institutional and human capacities. Public and private cooperation is key in this regard.
5. **Widen the hinterland.** Ports should aim at attracting cargo from neighbouring countries and domestic production centers. There is a common interest between many seaports and traders in neighbouring countries, especially landlocked countries. Investments in corridors, regional trucking markets, and cross-border trade and transit facilitation can help expand ports' hinterlands.
6. **Promote sustainability.** Port stakeholders are varied and may include shipping lines and traders, as well as social partners and the port-city community. Stakeholders are increasingly demanding that ports deliver on their social, economic and environmental sustainability obligations.
7. **Monitor ports' connectivity.** Policy makers, port authorities and investors need to continuously monitor trends in the global shipping network, the geography of trade, fleet deployment, and port performance. UNCTAD's Review of Maritime Transport and the complementary online statistical information and country profiles support this monitoring objective.

1.5 Research Problem and Questions

With the rapid development of technology and the growth of increasingly important business, there is also an increasing need for things closely related to the customer relationship. The increasing business competition facing many companies today focuses on how companies attract new customers and retain existing ones. In order to survive and succeed in dealing with the need for a good relationship between the company and the client. Customer Relationship Management (CRM) is a business method that is based on relationship management or customer relationship management.

Customer Relationship Management or better known as E-CRM, customers have difficulty in obtaining information and also conveying complaints to the company. Many companies use social media only as a means of communicating information, complaints, and criticisms from their customers, and it also took a long time for the employee to respond to the customer's complaints. Through the web-based CRM system, it is expected to be able to provide convenience for customers to communicate with the company, and can also help the company to know the customer's desires in depth, so that the company can know anything necessary for the company to improve its performance, with good performance, the company will be able to retain old customers and acquire new ones. So, the research question of this study can be stated as follows:

- ✦ Does the level of E-CRM implication can affect port performance?
- ✦ How can E-CRM affect customer satisfaction and loyalty?
- ✦ To what extent does customer loyalty change affected by the level of their satisfaction?
- ✦ What is the direction of the relationship between customer satisfaction and port performance?
- ✦ Does customer loyalty affect port performance?

1.6 Research Aim and Objectives

This study aims at identifying the role of CRM in enhancing port performance in regard to customer satisfaction and customer loyalty in MENA ports context. Based on the research aim, the main objectives of the research are stated as follow:

- Examining the impact of E-CRM on port performance.
- Discuss the extent of the effect E-CRM on customer satisfaction and customer loyalty.
- Studying the effect of customer satisfaction on their loyalty.
- Clarify the relationship between customer satisfaction and port performance.

- Explain the impact of customer loyalty and port performance.

1.7 Research Plan

In a bid to achieve the objective of the study, six chapters are used. The chapters' flow are as follows:

Chapter one: Introduction

Motivation statement, research questions, objectives, aim of study and an overview of the research methodology, dissertation structure and its summary.

Chapter two: Literature Review

Through literature review, the study attempts to analyze the three constructs; CRM concept, customer satisfaction and customer loyalty through previous studies. This information is used to build up a conceptual framework which examines the existence of a relationship between managing customer relationships with port performance. Chapter conclusion ensues.

Chapter Three: Presents the research design and methodology, the hypotheses and the analytical tools employed to explore the subject matter and its summary.

Chapter Four: Presents Egypt Port empirical analysis and discussion of the findings and summary of the chapter.

Chapter Five: Provides the conclusion of the study through a summary and research outlook, its implications, limitations and suggestions for further research.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

In this highly competitive business world, marketing, sales and product promotion are essential for the success of a business. One of the important things to note in order to compete with companies in the market is customer satisfaction (Ryu et al., 2012). For the past few decades, most of the company's focus is on how to obtain new customers. Nowadays however, many companies have realized that it is important to maintain existing relationships with customers (Hashmi et al., 2013). Customer Relationship Management (CRM) is a combination of technology, people and process to understand and manage the relationships between the company and its customers. The purpose is to maximize profits so that an optimal balance can be achieved between customer satisfaction and company investment. "CRM applications help to assess customer loyalty and measurable profitability such as repetitive spending, how much money is spent and longevity" (Trainor et al., 2014).

The most important thing and task in reducing lack of customers in a company is customer retention. The process that lasts a lifetime begins first through customer interaction. Products and services from the company are not only be considered through customer retention but also handling method on customers and the good intentions of the company. Customer retention can be achieved longer if the company meets customer satisfaction that is more than their expectations.

The main focus is to increase customer value compared to profit on a profit basis. Generally, it is proper when customers are disappointed with the relationship, they have with customer service (Amin, 2016, Oliver, 2014, Keisidou et al., 2013). However, how customers react to disappointment is an important issue for marketing managers (East et al., 2016). Satisfied customers do not always signify that they will be loyal (Curtis et al., 2011), while disappointed customers do not always signify that they will become unfaithful (Oliver, 2014). Some customers do not take any action even though they have been disappointed, while others like to complain directly to the product service provider (East et al., 2016). The world today, where everything has been combined with technology, CRM has been transferred to e-CRM Electronic Customer.

Relationship Management (e-CRM) is a collection of processes, concepts and tools that allow an organization to maximize their e-business applications (Soltani and Navimipour, 2016). The purpose of e-CRM is not only to bring about changes in the area of marketing, but also to improve the company's efficiency in managing customers, then to improve customer service, safeguard precious customers, and to help provide organizations with analytic capabilities (Zandi and Tavana, 2011).

The value of e-CRM helps to reduce the expense and to make business practice more efficient and create competitive profits (Charoensukmongkol and Sasatanun, 2017). Then another purpose is always to make a system available for better customer service and also help provide assistance for analytical skills within a company (Zandi and Tavana, 2011). The various opportunities provided by e-CRM including interactive and improvised customer relationships, managing

customers' touch points, personalization options, or even more, are powerful ways to gain competitive advantages (Zandi and Tavana, 2011).

E-CRM has been applied electronically using internet, web browsers, and other electronic media (such as e-mail, call centers and others). Computer technology including data warehouses, customer profiles, and decision support are all applicable in e-CRM. However, web and computer-related development makes various additional technologies applicable to e-CRM, such as voice portals (Interactive Voice Response), bots, virtual customer representatives and web phones (IP Telephony/VoIP) (Rai, A., 2011).

2.2 Customer Relationship Management (CRM) Concept

CRM has diverse definitions. Pereira et al. (2018) defined CRM as a business strategy which uses IT to provide a comprehensive, reliable and integrated view of the customer base so that all processes and interactions can help maintain and expand mutually beneficial relationships. CRM is defined by (Malthouse et al., 2013) as an integrated approach for managing relationships by focusing on customer retention and relationship development and points out that customer loyalty and long profitability are the benefits of CRM to an organization. Moreover, Payne et al. (2011) defined CRM as a business approach which seeks to create, develop and enhance relationships with carefully targeted customers with an aim of improving customer value and corporate profitability thereby maximizing shareholders value.

From the outlined definitions and other available definitions, it is observed that providing value to the organization's customers is fundamental to achieving mutual beneficial relationships, customer loyalty and long corporate profitability while improving customer value. To this effect, this study will adopt (Catalan-Matamoros, 2012) definition of CRM as a combination of people, process and technology seeking to understand company customers. Matamoros additionally states that CRM is an integrated approach which manages relationships by focusing on customer retention and relationship development. This implies that a CRM organization makes an effort to efficiently and effectively create a synergy between people (internal and external customers), process and technology so as to create positive relationships with both its existing and potential customers.

Wang et al. (2010) affirmed that successful CRM implementation focuses on keeping and maintaining long term relationship with customers which yields customer satisfaction and loyal customers. Loyal customers in turn contribute to the organization long run profitability. This is achieved as customers develop a sense of familiarity and social relationship with the organization thus making it difficult to switch to competitors.

2.2.1 CRM Implementation

Irrespective of wide contributions on CRM benefits, its successful implementation remains elusive to many organizations. Alshawi et al. (2011) pointed out that this has been caused by firm's lack of understanding that CRM involves company-wide, cross-functional, customer focused business process re-engineering than an undertaking in isolation. Similarly, Ernst et al. (2011) stated that CRM performance failure has been fueled by organizations considering CRM as an IT solution and a technology for a marketing strategy. Moreover, Aljawarneh and Al-Omari (2018) stressed that most organizations have failed to mainstream CRM benefits into their activities to enable them develop closer relationship with their customers thus failing in their CRM initiatives.

This implies that successful CRM implementation requires organizations to change the organizational culture; share information and coordinate marketing efforts across all departments; use CRM technology as an enabler to pursue enhanced opportunities by efficiently using available data to better understand customers' needs and preferences so as to develop customer centric strategies. Table 2-1 indicates some of the drivers and barriers to successful CRM implementation as outlined by different scholars.

Table 2- 1: Drivers and barriers of successful CRM Implementation

Drivers	Barriers
<ul style="list-style-type: none"> ➤ Focus on People, processes, Senior management commitment, cross functional integration, Customer information management, support for operations management (Al-Ghamdi and Badawi, 2019) ➤ Interrelationship of business and customer strategy (Payne et al., 2011) ➤ Effective leadership, sourcing, targeting and evaluation (Charoensukmongkol and Sasatanun, 2017) ➤ Strategy, Technology, organization alignment (Frow et al., 2011) 	<ul style="list-style-type: none"> ➤ Technological skill shortage, inadequate investment, poor data quality, failure to understand CRM benefits, lack of top management support and inadequate metrics (Payne et al., 2011) ➤ Cost poor leadership training (Akroush et al., 2011) ➤ Lack of strategic planning before CRM implementation, inability of the organization to integrate technology into the organizations marketing process (Rahman et al, 2018)

The CRM drivers and barriers as tabled above echo what other authors described as the reasons for CRM failure in most organizations (Aljawarneh and Al-Omari, 2018; Ernst et al., 2011). To affirm the studies above (Garrido-Moreno and Padilla-Meléndez, 2011) study undertaken to identify the most significant success factors in implementing CRM identified top management commitment, human resource and the structure of the organization as key to success.

Therefore, importance of the management support, employees, processes and technology for CRM success cannot be underestimated as shown in Figure 2-1.

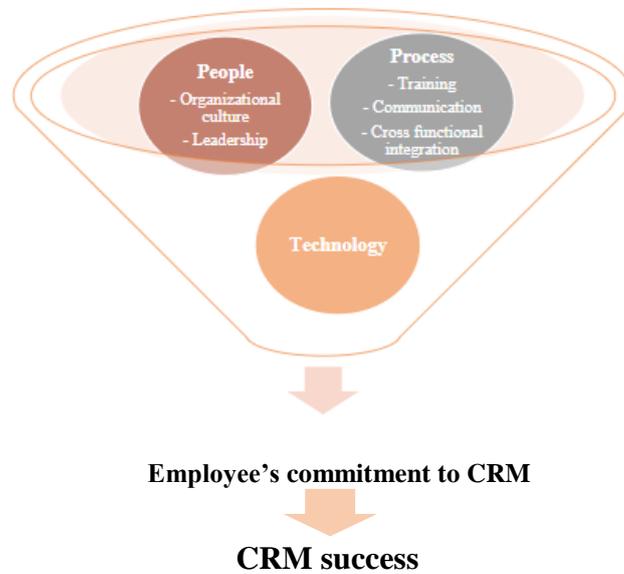


Figure 2- 1: Successful CRM implementation

Mohammed and Rashid (2012) summarized CRM benefits as improved ability to target profitable customers, Integrated offerings across channels, improved personnel efficiency and effectiveness. Aliyu and Nyadzayo, (2018) additionally stated that CRM enables firms to successfully interact with their customers in a profitable and dynamic manner whereas (Aljawarneh and Al-Omari, 2018) states that building CRM derives a firm diverse benefit by baring competitors from knowing the organization's customers. Therefore, an organization which implements CRM by integrating its internal processes and functions using IT as an enabler to produce high quality service adds value to its customers and is able to achieve CRM benefits as mentioned.

CRM, Service Encounters and Technology

Organizations which consider CRM as an IT solution or a marketing strategy technology fail to realize CRM benefits. Pereira et al. (2018) clarified this by stating that technology role encompasses; facilitation of better interaction between customers and service personnel, making call centers more efficient, discovering new customers, and simplifying marketing and service efforts among others. Zerbino et al. (2018) additionally emphasize that CRM strategy and technology offers firms with multiple opportunities to overcome the limitations of service marketing such as intangibility, inseparability, heterogeneity and perishability.

Therefore, technology will provide a CRM port with an integrated approach in managing important aspects of customer relationships and adding value to various dimensions involved in customer relationships. For this objective to be achieved, there is need to integrate technology, port management, its employees and customers as indicated by (Bitner et al., 2000) in the service marketing triangle (Figure 2-2) where technology acts as the potential hub in the marketing relationships.



Figure 2- 2: Service marketing triangle

Source: Hsieh (2018)

The figure shows that ports can significantly benefit from use of technology when there is a synergy between the three actors; management, employees and customers. Technology comes in as an integral part of the CRM system to influence the relationships by using database to understand customer's needs (Pereira et al., 2018). For example, using ports website for either general or specific communication like providing itinerary of ship arrival; advanced call centers for instance the use of automated call distribution system which can direct the calls to the proper department which addresses the customers' queries. The external marketing link between the port management and the customers is the point at which the port seeks to develop and executes its marketing mix "7 Ps" of service marketing. It includes product, price, place, promotion, physical environment, process and people (Lovelock & Patterson, 2015). The marketing mix is used as a strategic lever needed to create viable strategies which satisfy customer needs profitably while providing the port with a competitive position in the marketplace.

Pereira et al. (2018) stated that the employee - customer link is the area closely tied to service encounters. This is because it is the place where the two frequently interact hence interactive marketing takes place at this point. As employees' input is key to providing services, the interaction between the two at this point determine customer satisfaction or dissatisfaction. It is therefore at this point when the encounter determines whether the customers stay with the port or leave to competitors. Hsieh (2018) emphasized that technology can be used by contact employees to improve the efficiency and effectiveness of service encounters by enabling customization, improving service delivery and spontaneously delighting customers. Additionally, (Pereira et al., 2018) explain that it is during the service encounter that technology may replace the traditionally human involvement to provide service more efficiently and effectively for the benefit of both parties.

Lastly, is the interaction between the management and the employees referred as internal marketing. Employee's commitment is a significant factor to successful CRM implementation as pointed in the employee's customer link above. For employees to satisfactorily deliver quality services to customers there is need for empowerment which can be achieved through training, incentives and proper treatment from the organization management. For successful CRM, organization should ensure recruitment of qualified personnel and continuously provide its personnel with training to keep them abreast with the changes in the industry.

Therefore, CRM technology is the information technology which acts as a facilitator for CRM activities within the port with a specific aim of creating and maintaining superior customer value and continuously delivering high quality service to customers. This will in turn satisfy customer needs which are expected to yield customer loyalty to the organization which will contribute to better performance (Ernst et al., 2011).

2.2.2 Difference between CRM and E-CRM

CRM applications are created around the product functions and work. The application is made for corporate departments or individual employees and to provide customer service more effectively and to access customers related to intelligence. The e-CRM application is created with customers as a frame of mind and gives customers a full experience on the web. Every different user has a view of information related with services and products available to them. Web-enabled CRM is usually created around one business unit or department and not for the whole company. In e-CRM on the other side, all applications are made for the entire company including all customers, supply providers and coworkers.

E-CRM refers to simpler, more web-based electronic customer relationship management (Brennan et al., 2020). The main difference between CRM and e-CRM is in CRM customer contact. CRM customer contact is obtained through traditional ways such as telephone, retail or fax stores, while e-CRM can get customer contact via wireless, internet, email and the latest technology. Web-enabled CRM is usually created around one business unit or one department and not the whole company. Whereas the opposite, e-CRM is an application made for the entire company including the customer supply provider. Traditional CRM does not allow companies to dynamically change marketing campaigns at home, while e-CRM provides these capabilities (Adlin et al., 2019).

Table 2-2 includes a comparison between CRM and e-CRM, as well as the differences between them, and the similarities.

Table 2- 2: Difference between CRM and E-CRM

Criteria	CRM	E-CRM
Interface system	Work with "back-end" applications through an ERP System	Made for "front-end" applications as they turn interfaces with "back-end" applications through ERP data warehouse and data mart systems
Customer contact	Customer contact starts through traditional methods such as retail store calls and faxes	In addition to the telephone, contacts can be started via internet, e-mail, wireless, mobile and PDA technology
Overhead System (Client computer)	Web-enabled applications require a PC client to download various applications	Does not require these requirements, a browser is a customer link tool to e-CRM

Customization and personalization of information	A personal view for a different audience is not possible. Individual customization is needed for program changes	Individual views that are very dynamic and personal based on spending and choices are possible. Each individual audience can customize the view
Focus system	The system is created around the function of the product and its work	Systems made around customer needs
Modification and maintenance system	Implementation becomes longer and management becomes more expensive because of the system.	Reduced costs and time. The implementation and expansion system can be managed in one location on one server.

The real difference in CRM and e-CRM technology is the appearance of web-based applications. It is easy to say that the use of internet CRM is a strategy that is indispensable and not just for luxury. Therefore, in this literature review, the results of the benefits of e-CRM from various aspects such as current challenges, developments, comparison between CRM and e-CRM, benefits, impacts, customer relationship and customer satisfaction and the importance of e-CRM will be discussed in relation to customer interaction. The aim is to find out what future potentials can be done to increase customer interaction with implementation through eCRM (Adlin et al., 2019).

2.2.3 Literature Review on E-CRM

This section presents the previous literature that dealt with E-CRM and study the challenges facing the implementation of the E-CRM system. This section deals with the previous literature on E-CRM from 2006 to 2017. Rai (2011) describing the benefits obtained from using e-CRM and what technologies are used in implementing e-CRM. The results of this study mention that e-CRM provides many advantages and also information relating to what technology is used in e-CRM. The challenge that occurs in this research is when effectiveness in managing moment of truths with customers. This section becomes the difficult part of a customer and company relationship. The flow of information in e-CRM is online, real time and continuous. In the study also mentioned that the previous database system integration can be done by integrating the database into e-CRM systems in order to obtain the effectiveness of competitive advantage.

Farooqi and Dhusia (2011) explained the results of the comparison between traditional CRM and e-CRM. The results of this study state that e-CRM can provide several benefits better than using traditional CRM. The internet has helped to progress in e-CRM. Because the internet has made many interesting features that are attractive to customers and companies. So, in order to strengthen the function from the internet, the companies need a new approach for the eCRM. The difference between web-based CRM and e-CRM is that web-based CRM is designed only for around the department and one business unit is not the entire unit of the company while e-CRM covers all of the company's units. Traditional CRM implementation takes too much time and cost while implementing e-CRM is very fast with lower costs.

Grover (2011) described several developments that have been made in e- CRM that facilitate online services to customers. According to the study, it was stated that e-CRM technology can be implemented in two ways, namely through ecommerce web portals and through customer cycles. This paper describing how the processes implemented to each way. Customer demand by the company is now required by the company to provide access to multiple communication channels quickly such as web chat, e-mail, web and telephone, because the channel has the ability to flawlessly integrate from one intermediary to another. The e-CRM system must allow access to customers through a variety of touch points such as face-to-face contact, fax, VoIP, web forms, e- mail, web self-help and phone. Then it must also allow access to user systems through various client systems such as personal digital assistants (PDAs), personal computers and mobile phones.

Khaligh et al. (2012) described many opportunities for using e-CRM in marketing for companies. Such as increased interaction and relationships between customers by offering options in personalization, which all options are a source of competitive advantage. Discussing the challenges in e-CRM such as customer relationships and interactions, setting up an online channel, the challenges of data integration and IT architecture. The use of this e-CRM can limit the intimacy of the relationship and interaction between customers and the company because there is no physical relationship and interaction. So that these online and remote relationships and interactions result in more difficult trust in customers. Because these beliefs becoming harder, customers also becoming more difficult to share their data. Guarantees and privacy policies are important here so that trust can be built for the effectiveness of e-CRM in the company.

Salehi et al. (2015) explained how e- CRM can affect the customer loyalty to companies that use e- CRM features especially on banks. The results of the present study show that the implementation of e- CRM has a positive and significant impact on customer loyalty. Now, customers expect more for more effective and efficient banking customer service, especially shorter periods of time and more cost-effective expenses so that customers will be more satisfied. Therefore, customer satisfaction is a challenge in the banking world to continue to innovate in the use of information technology in the future. The influence of e-CRM by the bank will have a positive impact in the form of increasing

customer satisfaction which is determined the level of customer loyalty to the bank where the e-CRM has an important role in it.

Ismail and Hussin (2016) Explaining how e-CRM especially the use of E-ticket services can affect the customer satisfaction to airlines in Malaysia. The results of the present study show that the majority of respondents who were the subject of the study were satisfied with eservices provided by airlines in Malaysia. The challenge is that there are limitations to online features in customer service, especially for customer satisfaction and loyalty to E-ticket services for airlines in Malaysia. Another challenge is response bias because most customers have more positive responses to the airlines that they are more familiar with to use. E-CRM in pre-purchase and post-purchase impacts positive for the relationship between the company & customers and the level of customer satisfaction that increased significantly. This level of customer satisfaction can indirectly make a long-term relationship and guide customer loyalty between the customer and the company.

Mang'anyi et al. (2017) explained relationship between the level of customer loyalty and e-CRM with case studies in the Kenyan commercial bank, using a cross-sectional survey design method whose data was collected through several customer samples using a selfquestionnaire –administered conventionally in a Kenyan international bank. The results of the present study show that e-CRM features in pre-service, when service and post transactional has a positive impact and a significant relationship with pre-service e-CRM features & loyalty and when service significantly predicts loyalty. The result clearly supports the proposition that eCRM construct is an antecedent to loyalty.

The challenge in the study is that there are limitations in the provisions for sampling because the convenience samples are used. The positive impact of post service features but not significant for customer loyalty can be further explored. The results of the findings based multiple regression analysis and on correlation indicate that the e-CRM feature in pre-service, when service and post transactional has a positive impact and a significant relationship with pre-service e-CRM features & loyalty and when service significantly predicts loyalty. Improvement for practical e-CRM can be a strategic competitive tool that can impact both relationships between customers and banks. Table 2-3 summarizes the previous literature which discussed the E-CRM.

Table 2- 3: Literature Review on E-CRM

Author	Objective	Contribution	Challenge	Conclusion
Khaligh et al. (2012)	Describing many opportunities for using e-CRM in marketing for companies.	Discussing the challenges in e-CRM.	The use of this e-CRM can limit the intimacy of the relationship and interaction between customers and the company.	Trust can be built for the effectiveness of e-CRM in the company.
Grover (2011)	Describing several developments made in e-CRM that facilitate online services to customers.	This paper describing how the processes implemented in two ways, namely through ecommerce web portals and	Customer demand is now required by the company to provide access to multiple communication channels quickly.	The e-CRM system must allow access to customers through a variety of touch points. Then it must also allow access to

Author	Objective	Contribution	Challenge	Conclusion
		through customer cycles.		user systems through various client systems.
Farooqi and Dhusia (2011)	Explaining the results of the comparison between traditional CRM and e-CRM.	The results of this study state that e-CRM can provide several benefits better than using traditional CRM.	In order to strengthen the function from the internet, the companies need a new approach for the e-CRM.	Traditional CRM implementation takes too much time and cost while implementing e-CRM is very fast with lower costs.
Rai (2011)	Describing the benefits obtained from using e CRM and technologies are used in implementing e- CRM.	The results of this study mention that e-CRM provides many advantages relating to what technology is used in e-CRM.	The challenge that occurs is when effectiveness in managing moment of truths with customers.	The flow of information in e-CRM is online, real time and continuous.
Salehi et al. (2015)	Explaining how e- CRM can affect the customer loyalty	The implementation of e- CRM has a positive and significant impact on customer loyalty.	Customer satisfaction is a challenge in the banking world to continue to innovate in the use of information technology in the future.	The influence of e-CRM by the bank will have a positive impact on customer satisfaction.
Ismail and Hussin (2016)	Explaining how e-CRM can affect the customer satisfaction.	The majority of respondents satisfied with e-services provided by airlines in Malaysia.	The challenge is that there are limitations to online features in customer service, especially for customer satisfaction and loyalty.	E-CRM impacts positive for the relationship between the company & customers and the level of customer satisfaction that Increased significantly.
Mang'unyi et al. (2017)	Explaining relationship between the level of customer loyalty and e-CRM.	The result clearly supports the proposition that e-CRM construct is an antecedent to loyalty.	The challenge is that there are limitations in the provisions for sampling because the convenience samples are used.	The results of the findings indicate that the e-CRM feature has a positive impact on pre-service e-CRM features & loyalty.

2.3 E-CRM and Service Relationship

2.3.1 The Service Relationship

There are three levels of a service experience, namely, pre-service, during the service sale and after service, which help fortify relationships while increasing overall customer satisfaction (Lu et al., 2016). According to the Transaction Cycle Framework (TCF) (Navimipour and Soltani, 2016), the three features in e-CRM, namely, pre-transaction, during and post transaction, (Volume 12, Issue 2, 2017, p107) transaction, are encountered by the customer during a service purchase, at the time of purchase, and after the purchase (Mang'unyi et al., 2017).

The transaction cycle reinforces the three-stage relationships while increasing the overall customer satisfaction. The consumer's behavior with regard to a service enables a marketer to establish a products or service's position, so as to increase its consumption, as well as appreciating buying processes (Mang'unyi et al., 2017). Thus, it can be stated that e-CRM depends upon an understanding of consumer buying behavior (Grover, 2011). Pre-service transaction features include sign-in or log in capabilities, information customization and personalization, and information search capabilities, including several items, for example, site customization, local search engine and chat in the pre-purchase stage will lead to site traffic, pre-purchase satisfaction, trust and retention (Peštek and Lalović, 2012; Rozita, 2012; Tian and Wang, 2014).

Personalization of communication while making it efficient between seller and buyer, as well as of a product or a service, will draw customers towards the firm (Lam et al., 2013; Mogharabiet al., 2014), since they get good experience (Nikhashemiet al., 2013; Wells et al., 2011) and support their final purchase decisions (Zeithaml et al., 2012). According to (Zeithaml et al., 2012), online information efficiency is referred to as e-service quality, since a customer who is satisfied with the e-service may purchase the product or service.

The organization would, therefore, be able to get more information about the customer and package this information as per individual customer's needs and desires (Ha and Janda, 2014; Hung et al., 2014; Peng et al., 2015). Different e-CRM features during transaction stage can influence a customer's decision to complete the online transaction. Customers' education is vital at this point (Soltani and Navimipour, 2016).

Marketing tools such as emails, site personalization, loyalty schemes, price information, and reward schemes strengthen the relationship between a company and a customer (Miller and Barbour, 2014). Online surveys assist in attitude judgment and possible evaluation of customer behavior significant for website customization (Park, Cho and Rao, 2012), as such, the organization is obliged to provide information pertaining purchase conditions. Post-service e-CRM features comprises frequently asked questions (FAQs), problem solving and online feedback (Soltani and Navimipour, 2016), which essentially entails customer service. Usually a help desk is established, where all customer correspondence issues with regard to a service or product are channeled thereby, creating a 'personal interaction' with the organization (Peštek and Lalović, 2012).

New technological tools such as the Internet, wireless communications, speech recognition, and video help organizations are used to integrate all customer interactions on a central platform providing customers with more control on the services they want (Abdulfattah, 2012). Some researchers, for example, (Olupot and Kituyi, 2013) have stressed components such as FAQs, complaint's ability feature, problem solving feature (online self-help functionality), feedback channels, order tracking and online communities.

Since customer satisfaction is a post purchase experience (Assouad and Overby, 2016), the aforementioned features are critical for increasing the customers' post-purchase satisfaction via one-to-one communication and support from the company's website. Therefore, e-service quality will be assessed based on the competence and enthusiasm of service providers to respond to the customer's problems after the purchase and, their willingness to inform customers about their special offers and complementary services or products (Park et al., 2012).

Good e-service quality at the post e-CRM stage is believed to increase online customer's loyalty (Alim and Ozuem, 2014; Koçoglu and Kirmaci, 2012; Lam et al., 2013).

2.3.2 E-CRM

Adoption of e-CRM has been a recent strategy in the majority of business organizations, more particularly the developing countries, and, as such, managers have strategically invested in online technologies while emphasizing the building and maintaining of worthy linkages with profitable customers (Harrigan et al., 2012; Nguyen and Mutum, 2012; Sigala, 2011; Thuo et al., 2011). Merging technology, processes and other business activities around the customer has facilitated CRM applications (Abdulfattah, 2012), enabling organizations to recognize the best customer, increase their satisfaction and loyalty.

Effective use of relationship marketing can help to create competitive advantage (Harrigan et al., 2012; Thuo et al., 2011); and firms that have implemented fundamental eCRM practices are reaping numerous benefits ranging from superior customer service, improved profitability, sales, reduced operational costs, enlarged customer base and a broader market share (Jamali et al., 2013; Kihara, 2015). The aforementioned benefits emanating from e-CRM practices are associated with customer satisfaction (Alim and Ozuem, 2014; Rabbai, 2013). It is, therefore, vital to create more value to customers since these nurtures interpersonal ties that lead to repeat purchases that benefit the business and consumer marketing.

Recent studies (Abdulfattah, 2012; Rahimparvar, 2014) on the use of e-CRM in building customer relationships established that it affects online customer satisfaction, service quality and retention (Mang'unyi et al., 2017; Tian and Wang, 2014), and promotes the development of an attractive virtual community which further enhance satisfaction (Alim and Ozuem, 2014). Researchers (Koçoglu and Kirmaci, 2012) have also identified e-CRM antecedents of loyalty in the financial services industry. Therefore, an organization's resources such as organization-customer interface, flexibility, speed of response, etc., need to be positively augmented in the relationship between e-CRM practices and marketing throughput.

2.3.3 E-CRM Technology

CRM has developed rapidly. CRM has now become e-CRM because of the increasingly sophisticated technological development. Khaligh et al. (2012) mentioned in his study that the use of e-CRM can limit the intimacy of relationships and interactions between customers and companies because there are no such relationships and interactions physically. However now, it can be overcome with the current of e-CRM technology. Its effect is very strong on customer loyalty

to companies that have used e-CRM features based on a study conducted by (Salehi et al, 2015), who found a positive impact on the level of customer loyalty. Findings by (Ismail, and Hussin, 2016 and Mang'unyi et al, 2017) also support this theory, which the effect of using features in e-CRM for the level of customer satisfaction has a positive impact on customer loyalty.

Traditional CRM implementation takes too much time and cost, while e-CRM has proven to cut costs and can be implemented very quickly as proven by (Farooqi and Dhusia, 2011). Moreover, the flow of information in e-CRM can also be done online, real time and continuously. In a study conducted by (Rai, 2011) database systems can be integrated with eCRM systems in order to obtain the effectiveness of competitive advantages.

In addition to the benefits derived from the benefits of e-CRM, various technologies in e-CRM are also mentioned in a study by (Rai, 2011) such as Voice Portals (Interactive Voice Response), Bots, Virtual Customer Representatives and Web Phones. The e-CRM technology that is developing until now is explained respectively as follows.

2.4 Customer Satisfaction and Loyalty

In this section, previous literature that dealt with the study of customer satisfaction and loyalty will be dealt with, and definitions for them will be presented. In addition to the opinions of previous researchers that they presented in their research on how customer relationship management affects customer satisfaction and loyalty.

2.4.1 Customer Satisfaction

Customer satisfaction describes the interaction between corporate behavior and customer behavior, and its theoretical research began in the 1990s, after 10 years of research, and the theory has been greatly developed. At the same time, due to the development of CRM theory, research on customer satisfaction has also received more attention. CRM emphasizes the use of modern technical methods to cultivate customer satisfaction. Whether it is traditional or modern means of marketing, the primary purpose is to satisfy customers' needs, and to enhance customer satisfaction is the essential aspect of business survival.

Needless to say, CRM is much more than a technology, it is a management style and management models. All for customers, improving customer satisfaction is the core of CRM. Customer satisfaction can make old customers repeat purchase, recommend others to buy, while new customers can reduce development costs. Customer satisfaction depends not only on the quality of services provided by the organization, but also on whether customers are satisfied with the results of the comparison of customers' perceptions of service performance with their own expectations (Tao, 2014).

CRM is all about improving relationships to achieve maximum customer satisfaction over time. The ultimate rationale for CRM, like any management innovation, is to increase income through customer satisfaction. In this case, CRM is mostly accomplished by providing quality services to your customers. Moreover, the great need for CRM is mentioned below:

- a) To understand customer expectations
- b) To understand how to manage customers
- c) To focus on building relationships
- d) To generate a customer focused CRM solution
- e) To understand and initiate customer need

Maintaining relationships with customers and offering them absolute customer satisfaction seems is the foremost agenda of industries these days. Customer Relationship Management (CRM) seems to offer the much-needed strategy and solution to keep customers happy, smiling and connected with the organization across their lifetime. It was observed that customer satisfaction increased with the successful implementation of CRM practices across the organization (Hassan et al., 2015).

CRM can be viewed as an opportunity for outlets to use this information to improve the quality of their services and their relationship with customers which leads to higher levels of customer satisfaction as CRM applications can reduce operational costs and improve profitability/service delivery, thus enhancing customer satisfaction. Therefore, CRM implementation provides a great opportunity for companies to improve their performance in terms of customer lifetime value, customer satisfaction, and profits (Long et al., 2013).

2.4.2 Customer Loyalty

The literature on the impact of CRM on customer satisfaction and customer loyalty is growing rapidly due to increased interest of researchers in this area. Customer loyalty, on the other hand, has been conceptualized into three dimensions: relationship length (RL), customer trust (CT), and commitment.

- **Relationship length:** is the amount of time that customers had been associated with the organizations.
- **Customer trust:** is defined as a willingness to rely on an exchange partner in whom one has confidence.
- **Commitment:** refers to a commitment toward enduring desires for customers to maintain a valued relationship with them (Bin-Nashwan and Hassan, 2017).

Developing a relationship with customers is the best way to earn their loyalty. Customer loyalty refers to the consideration paid for the purchase amount of a particular brand. The most important objective of the organization is to maintain customer loyalty and focus on a customer-centric approach in their organizational and marketing strategies (Bin-Nashwan and Hassan, 2017). The most important objective of an organization is to maintain customer loyalty and focus on a customer centric approach in its organizational and marketing strategies. It is argued that satisfying customers is not sufficient. This is because customer satisfaction should have a direct impact on customer loyalty. It was also emphasized that there is a growing recognition that the final objective of measuring customer satisfaction should be customer loyalty. CRM is implemented in an organization to reduce cost and increase company performance, which means profitability as a result through customer loyalty. Amplify relationship management with the company's customer and competitor relationships to increase the organization's market share by integrating technology, procedures, and people. The goal of CRM is to retain customers, increase their loyalty, and increase the profits of the organization. Customer satisfaction and satisfaction are two key components in the successful implementation of CRM to maintain customer loyalty to the company (Long et al., 2013).

2.5 Port Performance

Port performance and port selection are among the most popular topics when it comes to port studies. Despite this, they have largely been treated by researchers as two separate courses of action. As a result, port performance measurement is not sufficiently developed from a port selection perspective. Performance ensures the economic efficiency and effectiveness of the port, the services provided to the local users of the port, or the governance of the organization. There are two main approaches that can be considered to measure port performance from port selection perspective. The traditional approach involves direct measurement of indicators through observation, interviews, and surveys. Quantitative analysis is performed to understand the relationships between these factors (Rezaei et al., 2019).

The previous port performance assessment literature has evaluated port performance, but not from the perspective of individual services provided by their service providers. Port services are provided by a number of service providers:

- i. the port operator,
- ii. third-party shipper intermediaries (for example, freight forwarder, third-party logistics provider, customs broker) who provide port services to shippers' shipments while in the in port
- iii. shipping line agents, i.e., third party intermediaries who provide port services to ships (both ship owners and charterers) while they are in port;
- iv. harboring pilots who assist the master of the ship in the movement of the ship to and from the port of the port and anchorage;
- v. Towing companies whose boats are used to moor and unload ships to and from the quay (or berth);
- vi. Government customs clearing a port's imports shipment for entry into the country.

An executor is technically efficient when he increases his productivity using certain levels of resources (Talley et al., 2014). Companies such as port authorities and port terminal operators use various performance management techniques to gain insight into the quality, cost-effectiveness and profitability of their operations. Performance carries the element of efficiency with respect to the extent to which the expended resources are used, and in this respect the outlets and terminals convert the inputs into the process into outputs (Rezaei et al., 2019).

Little research has been done on the CRM process and company performance. They further suggest that the ability of CRM to successfully improve organizational performance depends on the extent to which technology improves the organization's marketability. This is achieved by providing marketing and service support, effective data integration and analysis, customer centric organizational culture and management system. Organizational performance includes the organization's actual output or results as measured by its intended outputs, goals, and objectives. A port's performance refers to its effectiveness in achieving its purpose, and in most cases, the purpose of its measurement is to improve the organization's financial result.

Therefore, organizational performance is the process of achieving pre-determined organizational goals by increasing efficiency, quality, productivity and profitability from the perspective of the customer as well as the organizations. Based on the CRM discussions provided, CRM can be used to achieve these goals efficiently and effectively. Increased customer satisfaction, loyalty, and port performance after a CRM implementation can be used to measure the benefits of CRM as demonstrated by increasing the physical, financial, and quality performance of a port (Mkawuganga, 2018).

2.6 Chatbots

Chatbot is a computer program or an artificial intelligence that contains a conversation through auditory and textual methods. Based on the research chosen as the reference for this study, the chatbot will be categorized as follows:

2.6.1 Techniques for Speech Conversation System

In a study by (Abdul-Kader and Woods, 2015), nine chatbots were surveyed based on their contributions to previous studies. Chatbot was chosen based on each development from a decade ago. Comparisons between chatbot design techniques were carried out by referring to studies selected with the Loebner Prize Winning chatbot technique. The results showed that the development and improvement of chatbots did not develop quickly according to predictions because the methods and approaches carried out were too varied in building a chatbot.

Which chatbot technique is the best is still under debate and no approach in general can be identified. Chatbot, which has been designed for dialogue systems in research references, is generally still limited to a number of applications. Chatbot with a more general-purpose needs development by building more comprehensive knowledge bases. With product chatbot dialogs such as Microsoft Cortana have been commercialized on a basis, development must be carried out continuously, but a common solution is still lacking.

2.6.2 AIML Based Chatbot

In a study by (Satu and Parvez, 2015) there were several applications that were integrated with AIML-based chatbots which were then analyzed one by one. There were 12 applications that have been analyzed. These applications were related to e-learning, e-government, cultural heritage, web-based models, dialog models, semantic analysis frameworks, interaction frameworks, humorist experts, network management and adaptive modular architecture.

The existing system is integrated using AIML chatbot because integrated systems have a significant role in various client services. It is very inconvenient for a visitor to understand the system easily without any. Therefore, the service is provided by chatbots to visitors. The integration of chat service provides service providers with additional business facilities for certain services. Therefore, in this study, the service has a broader business field to manage customers using more efficient and flexible ways.

2.6.3 Implementation of Techniques with Various Chatbots

In a study by (Deshpande et al., 2017) several chatbots were implemented with various techniques. The early history of chatbot was also discussed, namely ELIZA from 1964 until the latest in 2016, Tay, a Microsoft-made chatbot that triggered a controversy on Twitter by issuing inflammatory tweets and then was withdrawn as soon as possible after the incident. With the development of these technologies, chatbots have become increasingly important over time with various domains such as educational, scientific and commercial. The most important chatbot applications are financial advisors (Credit Score Coach), personalized stylists, free legal aid provider (DoNotPay), medical advice preliminary provider, personal concierge services and many more. The widest chatbot application is in the e-commerce domain for automating customer service.

2.6.4 Cloud Platforms to Develop a Chatbot

In a study by (Patil et al., 2017) various comparative tests were conducted for cloud platforms to develop a chatbot. There were 3 cloud platforms discussed in this study. The selection of a cloud-based platform is often used by public, namely Microsoft Bot Framework, Heroku and IBM Watson. The cloud platform discussed in this study has different features and functions, with the elaborated analysis and the integrated environment in it. It can be chosen as an effective and efficient cloud platform for implementing chatbot technology according to the preferences of each user who wants to use the cloud platform.

2.6.5 Virtual Customer

A virtual customer handles customers without requiring face-to-face contact or online. Virtual customer community has developed rapidly which offers several features from online customer discussion forums to virtual product design that make customers involved in product development activities so that they are more feasible and cost effective. In a study conducted by Roberts and Dinger, (2016), it was examined what the impacts of the Virtual Customer Community for an organization are. There were 23 studies that were used as references. There are two implications obtained from the results of these studies, including:

- Practically, the design and virtual implementation of customer communities must make customer interactions increase. From the perspective of organizational communication, organizations can actively talk to customers by initiating discussions for products and services first and hiring engage customers in conversations and employees to supervise within the virtual customer community. Then in addition to the practitioners, it should be very intent when developing a virtual customer community strategy. It must be done by setting goals and objectives to be achieved in a virtual customer community.
- In theory and research, the virtual customer community interactivity plays an important role in a company's ability to innovate. Customers prefer selecting and communicating for the development of products and services they have known before. Such interactions in a virtual customer increases knowledge and companies with strong absorptive capacity can absorb this knowledge and apply it to the development of incremental innovations. This study also mentions that there is no proof of a relationship between absorptive capacity and radical innovation when a company promotes customer interaction within a virtual customer community.

2.6.6 Review of e-CRM Technologies

Table 2-4 presents the previous literature dealing with E-CRM and the study of chatbots in the E-CRM implementation process. This section deals with the previous literature on chatbot from 2015 to 2017.

Abdul-Kader and Woods (2015) described each chatbot technique for the speech conversation system. Various explanations have been made of research in the form of a chatbot survey with aW speech conversation system over the past decade. The survey was conducted with various aspects. Among other things, the analysis of speech and response that has been carried out, then reviewing the latest chatbot designs and also what factors are selected in influencing the chatbot design. In the study survey chatbot has been selected from its development a decade ago.

There are nine chatbots that have been surveyed based on each contribution in each of these studies. From the survey above it can be concluded that the development and improvement of chatbot does not develop according to the predicted prediction average due to the various methods and approaches used to build a chatbot. Roberts et al. (2016) conducted by Nicholas Roberts et al aims to find out what impact can be given by the virtual customer community interactivity on organizational innovation then what relationships can be gained between organizational innovation and absorptive capacity.

The impact obtained is that absorptive capacity is positively related to incremental innovation and is negatively related to radical innovation. The communication relationship between the organization and the customer is successfully changed communication through virtual customer communities in several ways that affect the innovation and learning activities of a firm. Satu et al. (2016) explained and reviewed each of the integrated applications with AIML based chatbot. The research conducted has obtained results that the applications that have been reviewed not only have provided many useful services, but also can provide solutions to problems and interact with customers. Their problems through AIML chatbot rather than through humans themselves.

The existing system is integrated using AIML chatbot. Various APIs and packages with lightweight AIML files make this system more interactive and flexible to be used in various places. Automated conversational agent-based systems play a significant role with the user. Therefore, the costs incurred by service providers are reduced by using automated conversational agents rather than human conversational agents. In addition, users get facilities with full-time chat services that make users interested in using this service. The integration of this chatbot service provides service providers with additional business improvements for certain services. Therefore, in this study, the service has a broader business field to manage customers using smart machines in a more flexible and efficient way.

Deshpande et al. (2017) explained and reviewed each implementation technique with various chatbots. In this study explained the initial chatbot development to artificial intelligence systems that have helped a lot in the business sector because it has helped by automating customer service and reducing human intervention. The importance of chatbots is increasing along with technological developments in various domains such as education, scientific and commercial. Various mobile devices can also be implemented in chatbots as intelligent personal assistants in the field of social networking to provide personalized marketing to customers as well as education such as artificial tutors so they can provide personalized and instant feedback to learners. Human computer interaction can be improved through chatbots. To improve existing customer relationships, chatbots can help and reduce human effort.

Patil et al. (2017) explaining between cloud based chatbot technology from various cloud platforms. So, anyone can choose the cloud platform to build the chatbot. The research conducted in this study has obtained results comparisons between cloud-based chatbot technology which results are more effective and efficient for the chatbot technology. The chatbot discovery has made developers and messenger apps and businesses work together and create a new environment. There are so many goals that can be developed for chatbots such as customer services, news updates, shopping, reservation, food order and much more. By choosing the analysis and results that have been processed by this research, everyone can choose which cloud platform to use to build chatbots.

Table 2- 4: Previous Literature about Chatbot

Author	Objective	Contribution	Results
Abdul-Kader and Woods (2015)	Describe each chatbot technique for the speech conversation system.	The analysis of speech and response that has been carried out, then reviewing the latest chatbot designs and also what factors are selected in influencing the chatbot design.	It can be concluded that the development and improvement of chatbot does not develop according to the predicted prediction average due to the various methods and approaches used to build a chatbot.
Satu et al. (2016)	Explain and review each of the integrated applications with AIML based chatbot.	The research conducted has obtained results that the applications that have been reviewed not only have provided many useful services, but also can provide solutions to problems and interact with customers.	The existing system is integrated using AIML chatbot. Various APIs and packages with lightweight AIML files make this system more interactive and flexible to be used in various places.
Deshpande et al. (2017)	Explain and review each implementation technique with various chatbots.	It explained the initial chatbot development to artificial intelligence systems.	The importance of chatbots is increasing along with technological developments in various domains.
Patil et al. (2017)	It is explaining between cloud based chatbot	The research has obtained results comparisons between cloud-based	The chatbot discovery has made developers and messenger apps and

Author	Objective	Contribution	Results
	technology from various cloud platforms.	chatbot technology which results are more effective and efficient for the chatbot technology.	businesses work together and create a new environment.
Roberts et al. (2016)	It aimed to find out impact of virtual customer community interactivity on organizational innovation.	The impact obtained is that absorptive capacity is positively related to incremental innovation and is negatively related to radical innovation.	The relationship between the organization and the customer is successfully changed communication through virtual customer communities in several ways.

2.7 Development of Research Hypotheses

This section is assigned to develop the hypotheses of the research according to previous literature showing the same relationships hypothesized in this research.

2.7.1 Relation between E-CRM and Port Performance

In this section, the previous literature that dealt with the evolution of CRM and its implementation in different business sectors and different countries. This section includes previous literature from 2010 to 2018.

Abdullateef (2010) aimed at developing a conceptual framework and valid propositions on the impacts of Customer Relationship Management (CRM) dimensions on call center performance. The researchers primarily used qualitative approach that involves initial qualitative interview and detailed literature reviews of academic literatures and industry reports on CRM and customer contact centers. The findings in this study indicate that there is strong reason to modifying the existing CRM implementations and organization's performance measurements within the contact center industry. More importantly in areas such as measuring perceived service quality, first call resolution, customer satisfactions and dissatisfactions.

Beyond these findings it is shown that perceived service quality of the contact centers positively mediates the link between the customer orientation and caller satisfactions. There is a main limitation in the qualitative approach that was applied in this research, constraining it from the ability to generalize its findings and recommendations to all industries and countries. Importantly, suggestions from this research are not quantitatively backed by empirical data and appropriate statistical analysis that could validate the proposed theoretical linkages that exist between CRM dimensions, perceived service quality, first call resolution and caller satisfaction, thereby further limiting its diagnostic power of predictions. To rectify these limitations, this study suggests there is need for future study to embark on empirical data gathering to validate the proposed model.

However, as could be noted that this research has conducted a detailed literature review to establish the positive relationships that exist between CRM dimensions perceived service quality, first call resolution and caller satisfaction, it is important for future researchers to conceptualize and if possible, determine other constructs for measuring caller satisfaction within the contact centers, specifically the inbound call centers (Abdullateef, 2010).

Ahmad et al. (2012) examined the need of improved CRM in the hotel industry to increase the hotels performance. These days the hotel sector is experiencing a rise in globalization, competition, and higher level of customer turnover. Furthermore, increasing customer acquisition costs and growing customer expectations are making the hotels performance and competitiveness depend considerably on their ability to satisfy customers efficiently and effectively. On the other hand, there are lacks of transparency, quality, and analysis of these data in this sector. This study was based on the quantitative approach as two types of data were used; Primary and secondary data. Primary data was collected from the answers received from the clients of Umaid Bhawan in Jodhpur. Secondary data used in this research are from State Hotel of India annual reports and accounts, books, journals, periodicals and computer database.

CRM success requires effective service and suitable operation procedures, rather than only technological systems. Therefore, the achievement of CRM completion depends on the active involvement of the employees in the organization itself. Therefore, we can say that CRM organization has to be an essential means in the way they organize their actual business processes for employees and customers. In the end, all of organizations resources (such as marketing capabilities, policies, culture, and organization structure) have to be integrated in order to implement CRM successfully and, in turn, develop organizations performance. Most prior research also affirm the positive effect of CRM organization on customer retention, financial and marketing. The result is consistent.

There is a significant and positive relationship between CRM and hotels performance. They found CRM plays an important role in attracting customer to hotels. The findings were also revealing, who explored the effect of CRM on hotels performance. This study will also increase awareness among hotel managers to pay more attention to CRM dimensions, and to assist them in developing hotel performance and competitiveness. Furthermore, CRM technology can be used as an operational instrument for business internal quality control because it can transmit significant customers' data to where they are needed (Ahmad et al., 2012).

Gujrati (2016) explained the concepts of BI (Business Intelligence) in CRM and its benefits and to understand successful implementation of BI in retailing. Nowadays, in most business an effectual way of integrating enterprise applications in real time is introduced. This is done to create the competitive advantage. For this purpose, companies are implementing business intelligence tool (BI). The paper explores the theoretical concepts of BI, its components, benefits of BI. Through business intelligence tools, companies can achieve the strategic goal which leads to success. In this highly competitive environment retailers are emphasizing on customer intelligence so that it can also reduce the cost. Business Intelligence techniques are used by the companies to improve the skills, knowledge and wakefulness of customers and it is also helpful in increasing the turnover of the company.

It is also helpful in improving customer preservation. The improved business intelligence system helps the companies to predict customer demand. It helps in pleasing customers and building strong relationship and also helps in turning one-time purchasers into long term customers. As more retailers evolve into customer-centric and segment-based business, business intelligence (BI) and customer relationship management (CRM) systems are playing a key role in achieving and maintaining competitive advantage. Secondary data has been used in the study. The data has been collected through internet, magazines, journals, and other sources.

CRM strategies can help provide vital business intelligence. CRM provides the necessary customer data which gives businesses the sharpness required to make informed decisions. When a company understands what the customer wants, it can make straight its business goals and strategies to fulfill these wants. This is the function of business intelligence. Businesses across the globe are increasingly using BI software to aid business functions. Business intelligence goes a long way in helping managers gain critical on the way about their business and customer to take efficient and actionable decisions.

Managers in the retail sector can use business analytics to get insights about store operations, product demands and trends, customer's purchase behavior, stock and inventory to make strategic decisions about product placements, loyalty programs, promotions, marketing and much more. For a sector where competition is on the rise and customers tend to be highly price-conscious, customer insights help retailers to provide the right mix of product, place and promotions to increase store revenues. It can help improve the overall shopping experience to keep the customers coming back. Business Intelligence (BI) refers to the ability to collect and analyze huge amount of data pertaining to the customers, vendors, markets, internal processes, and the business environment.

A data warehouse is the corner stone of –wide business intelligence solution; various analytical (OLAP) and data mining tools are used to turn data -stored in the data warehouse - into actionable information. Customer Relationship Management (CRM) forms the focal point from where the vital insights gained about the customers – using BI tools -- are absorbed in the entire organization. BI also plays a critical role in all the other retail functions like supply chain management, storefront operations, and channel management (Gujrati, 2016).

CRM for retail and retailer brand loyalty is the corner stone of any retail marketing strategy. Loyalty in any market or sector is about delivering on a brand promise again and again. This could not be truer in the retail sector. Marketers are relentlessly looking for new ways to make it easy for people to fall in love with their brand. Loyalty schemes, campaigns and discount cards are among a few of the approaches, but you don't build a long-term relationship with a 10 per cent discount. Building relationships and loyalty is all about getting to know each other better.

The new breeds of CRM for retail solutions do just that. The systems and packaged solutions available on the market today give you a true 360-degree view of your customers. Just imagine how beneficial it would be to be able to track connections across multiple channels and touch points, analyze customer spend and profitability and uncover your best shoppers and advocates all accessible from any device, anywhere. What's more, your customers will love the pampering the systems will empower you to deliver. The 360-degree analysis, which is a core component of the new breed of SMART CRM for retail systems, ensures you are delivering relevance and in a timely fashion (Gujrati, 2016).

AKYÜZ et al. (2017) examined pre-sales, during sales and after-sales practices that forming part of the customer relationship management in the forest products industry businesses and tried to put forward CRM practices in the furniture and other forest products industries. The survey technique was used as a method of research. Also investigated by using One-way variance analysis (ANOVA) and t-test that whether average of points of customer relationship management implementation levels (pre-sales, during sales and after-sales).

In market conditions, for the survival of businesses, it is necessary to increase the services in pre, during and after-sales in order to provide customer satisfaction by working on the product that the customer will demand. According to the ANOVA analysis result, the difference between gender and the average of points of customer relationship management in during sales and after-sales was found statistically significant. According to the survey results, it was determined that the vast majority of employees of forest products industrial businesses participated in the survey is male. In terms of the tasks and positions of the employees in the business, 130 (% 37.8) of the employees were senior managers (general manager, assistant manager, business owner), 206 (%59.9) were middle managers (engineering, sales-marketing

representative) and 8 (%2.3) were lower-level managers (foreman, shift superintendent, employee). In other words, the level of importance that businesses have shown in after-sales customer relationships is high (AKYÜZ et al., 2017).

Roopchund and Alsaid (2017) seek to understand the impact of CRM on Higher Education in Mauritius. Mauritius has the ambition of becoming an educational hub and the need for improving relationships with students has become quintessential. The methodology of the research is based on a critical review of existing literature and also based on a survey carried out with students in Public Universities in Mauritius.

CRM applications need adaptation to the characteristics of the institutions. In response to these characteristics of the institutions. In response to these changes, the value, effectiveness and potential benefits of using marketing theories and concepts, which have been effective in the business world, are now being applied by many universities: with a view to gaining a competitive edge, and gaining a larger share of the international market. Nowadays, universities employ CRM to manage relationships with their students and alumni. He supports his idea by giving an example that, if a student enjoys his or her experiences at a university, he or she might recommend it to his/her personal networks afterwards. There is correlation between whether the University has a formal system of CRM and Student loyalty. There is a negative correlation between the two with P Correlation coefficient of $-.219$. The P value is $.028$ which is less than 5% and therefore we reject the Null hypothesis that CRM has no impact on Student Loyalty in a University system and accept the alternative Hypothesis (Roopchund and Alsaid, 2017).

Joudeh and Dandis (2018) studied the level of service and its influence on customer satisfaction and loyalty. The level of the service is determined by customers is seen very important by the organization to determine the ability of the organization to deliver such service and to satisfy customers leading to their satisfaction. From that point, the current research study aims at understanding the mediating role of satisfaction within the internet service quality field in delivering customer to the status of loyalty to the organization. The current research study relied on the quantitative approach that used the questionnaire as a tool for the study. The sample consisted of (1000) consumers from various shops, shops and malls in Amman. through the application process; (860) people answered the questionnaire.

Relying on the concept of CRM within the organization can be the best approach into reaching the best customer satisfaction and reaching loyalty at the end. Well-built CRM can help in preserving the current customers and attract potential customers. Consumer loyalty is a conceptual idea where the real fulfillment differs from people and items relying upon various factors which incorporate administration quality and the individual desires. Low quality services, which does not achieve the clients' satisfaction, prompts customer disappointment, abnormal state of fulfillment is built up when the brand satisfies the necessities of clients much more than the contending brands (Joudeh and Dandis, 2018). The results of the study indicated that a good and well-built service quality may lead to customer satisfaction which in its turn can lead to a better level of customer loyalty. Consumer loyalty includes highlights or attributes that can fulfill the desires or needs of a client, it is a post utilization encounter which contrasts apparent quality and expected quality, in this way a similar conduct between inputs previously and after utilization. It was found out through the analysis that employees had no influence on the customer satisfaction and loyalty, from that point it is recommended that employees should be trained in a better and more scientific approach on how to deal with customers and satisfy them in order to gain their loyalty through the employees' attention to the details in the level of the service quality (Joudeh and Dandis, 2018).

Mang'unyi et al. (2018) explained relationship between the level of customer loyalty and e-CRM with case studies in the Kenyan commercial bank. The method used is cross-sectional survey design method whose data was collected through several customer samples using a self-questionnaire –administered conventionally in a Kenyan international bank.

The results of the present study show that e-CRM features in pre-service, when service and post transactional has a positive impact and a significant relationship with pre-service eCRM features & loyalty and when service significantly predicts loyalty. The result clearly supports the proposition that e-CRM construct is an antecedent to loyalty. The challenge in the study is that there are limitations in the provisions for sampling because the convenience samples are used. The positive impact of post service features but not significant for customer loyalty can be further explored. The results of the findings based multiple regression analysis and on correlation indicate that the e-CRM feature in pre-service, when service and post transactional has a positive impact and a significant relationship with pre-service e-CRM features & loyalty and when service significantly predicts loyalty. Improvement for practical e- CRM can be a strategic competitive tool that can impact both relationships between customers and banks (Mang'unyi et al., 2018).

Mkawuganga (2018) extended knowledge in port industry by suggesting that ports need to embrace CRM concept so as to enhance customer satisfaction, loyalty and port performance. A quantitative research approach through use of questionnaire survey is used to answer the research questions and achieve the objectives of the study. CRM systems help provide high quality of services and enhance customer value which leads to customer satisfaction and customer loyalty which in turn improves port performance. From the results achieved, KPA management can use the identified strengths to offer more customized services to its customers while improving on its weak areas such as management and processes. It has equally been seen that technology alone is not sufficient for CRM success but an enabler to enhance the quality of services provided therefore it's a driver to successful CRM implementation. The study shows that if CRM concept is

properly administered, it can contribute to long term significant economic value to the port and its customers. This is achieved when CRM system is able to enhance the ports' ability to deliver high quality services and enhance customer value through its value drivers including; technology, top management commitment, process alignment, cross functional integration, employees training and professionalism among others.

This will in turn generate customer satisfaction and customer loyalty. Satisfied and loyal customers generate more profits to the port through re- patronage, sharing positive experiences with potential customers. This maintains and adds to ports market share, creates good image for the port thus creating a competitive advantage for the port. However, to successively achieve this, there's need for the port to integrate its technology, process, and employees and customers so as to create synergy in the organization (Mkawuganga, 2018).

The results indicate that the rate of customer satisfaction to loyalty is lower. This shows a devastating scenario since the customers are only loyal to KPA because they lack alternatives. Irrespective of the monopoly status KPA enjoys, customers have the right to have value for their money. Hence KPA management need to reorganize their strategies to those which support customer related activities and more so develop incentives which promote CRM initiatives. It is important to continuously monitor changes in the industry since port industry is very volatile. By monitoring these changes, A CRM port is able to continuously customize their market offering for each market segment thereby meeting their customers changing needs. Additionally, CRM will enable the port improve reliability of its services to its customers through timely adoption to the market trends. This enhances customers experience with the port hence able to attract potential customers, retain its customers (Mkawuganga, 2018).

Based on the previous studies that were illustrated, the researcher can develop the first sub hypothesis of the first hypothesis of the study, which is: there is significant relation between E-CRM and customer satisfaction.

H₁: There is a significant relationship between E-CRM and Port Performance

2.7.2 Relation between E-CRM and Customer Satisfaction

This section will examine the relationship between E-CRM and Customer Satisfaction through some previous studies that the researcher has addressed on studying this relationship over the years from 2012 to 2021.

Liu et al. (2012) purposed to find the role of Electronic Customer Relationship Management in enhancing Customer Satisfaction and Customer Loyalty. Researchers targeted the banking sector in Taiwan, because in recent years the government gradually opened up the banking sector, which led to rapidly increment at the number of financial institutions that reached 37 domestic banks at the end of January 2010. Bank Sinopac was chosen as a targeted one and data was collected through a questionnaire from its users. Finally, the statistics and analysis proved that the usage of e-CRM had significant effect on the customer satisfaction and customer loyalty. In addition, customer satisfaction was proved to have significant impact on the customer loyalty.

Dhingra and Dhingra (2013) purposed to examine the advantages of e-CRM on both of customers' satisfaction and organization performance in banking sector. Two case studies were conducted in collecting the required data. First case study was made in the State Bank of India (SBI) and the second case study was made in the HDFC commercial bank located in India. The results proved that the bank ensured full security of providing e- CRM facilitates to their customers aiming to reach the satisfaction of those customers.

Janahi and Al Mubarak (2017) purposed to investigate the relation between service quality and customer satisfaction. Service quality was measured by six dimensions, which were: Assurance, Compliance, Empathy, Reliability, Responsiveness and Tangibility. The two researchers made a questionnaire in order to collect data of the required variables. This questionnaire targeted customers of five Islamic banks located in Bahrain. Questionnaires were distributed among 300 customers and 240 responses were received. The analysis proved that the six main dimensions of customer service quality had strong and positive impact on customer satisfaction.

Mang'anyi et al. (2018) determined the influence of electronic-customer relationship management (e-CRM) on customer satisfaction and loyalty, through targeting one of the largest Kenyan retail banks. Using survey mode, the researchers administered 90 surveys from the customers of this banks, where 78 of them were valid complete responses. An exploratory factor analysis was utilized in order to determine scale validity multiple regression modeling and path analysis. The concluded results from this analysis represented in the assurance of significant relation between e-CRM and customer satisfaction, which had a reflect on customer loyalty.

Farooq et al. (2018) examined the impact of quality of service provided by Malaysia Airlines on overall customer satisfaction. Convenience sampling techniques was used to select the targeted sample, as a self-administered questionnaire was done and 460 responses were collected. Analysis was done using variance based structural equation modelling (PLS-SEM).

The results proved a positive direct impact of empathy, airline tangibles, terminal tangibles, image and personnel services on customer satisfaction of Malaysia Airlines.

Afthanorhan et al. (2019) aimed to identify service quality dimensions that lead to customer satisfaction. In addition, they observed the effect of service quality on customer loyalty. The authors in this research targeted university libraries, as within the context of academic library; service quality is significant dimension to reach customers' satisfaction and loyalty. Primary data was collected through a questionnaire that was distributed in the library of the University Sultan Zainal Abidin (UniSZA) and 170 responses were collected. Data was analysed using covariance-based structural equation modeling as well as importance performance analysis. The results indicated that service quality has a significant relation with customer satisfaction.

Nunkoo et al. (2020) examined the effect of service quality on customer satisfaction in the hotel sector in South Africa. Questionnaire was conducted that targeted establishments located in each of the Western Cape, Kwazulu-Natal and Gauteng. The final sample consisted of 477 questionnaires, where 472 of them were complete responses. PLS-SEM was conducted for analysis and the outcome of analysis proved a significant influence of service quality on customer satisfaction.

Phan et al. (2020) studied the relation between port service quality and customer satisfaction in Vietnam. The researchers developed a survey questionnaire to collect the data. The targeted population was various container shipping lines and logistics companies located in Vietnam. Questionnaires were distributed among Logistics Associations, Association Shipowners, and Shippers' Council, where 200 questionnaires were distributed and 108 were received and 99 of them were valid for analysis. The outcomes assured that port service quality (PSQ) had a positive effect on customer satisfaction.

Yulianto (2021) investigated the relation between service quality (reliability, responsiveness, physical evidence (tangibles), assurance and empathy) and customer satisfaction. The author targeted the Pontianak Class II Port Authority and Harbormaster Office. Quantitative data was collected through a questionnaire and the final sample consisted of 81 responses. Analysis was made by utilizing multiple linear regression analysis and SPSS statistical software. Findings assured that there was a positive significant effect of service quality; physical evidence and assurance on customer satisfaction, while there is no significant effect of responsiveness, reliability and empathy on customer satisfaction.

Krishnan (2021) saw that any service organization depends on service quality as a guiding factor of its future, as the quality of services help in achieving satisfaction of their customers. Therefore, the author examined the service quality and its effect on customer satisfaction in primary health centers. Service quality was measured by many dimensions, which were: reliability, assurance, tangible, empathy, responsiveness. A questionnaire survey was done that targeted primary health centers located in Kottayam. Judgment sampling technique was utilized, where the sample consisted of 260 questionnaires and 215 complete answers were received. The results indicated a significant positive correlation between service quality dimensions and customer satisfaction.

Dartey et al. (2021) studied the factors of service quality and their effect on customer satisfaction of banking sector in Ghana. Service quality was measured by reliability, tangibles, responsiveness and empathy. Primary data was collected through a well-structured questionnaire. This questionnaire targeted four banks located in the Ga-West Municipality, which were: Ghana Commercial Bank, Amasaman Rural Bank, Ecobank, and Prudential Bank. Convenient sampling was used, where the final sample consisted of 200 questionnaires. Data was analyzed by conducting Smart PLS algorithm, blindfolding, bootstrapping and statistical package for social sciences (SPSS) version 23. The findings proved that the dimensions of service quality had a positive association on customer satisfaction. The results also indicated a crucial role of empathy and reliability in reaching customer satisfaction followed by tangibility and finally the responsiveness.

Based on the previous studies that were illustrated, the researcher can develop the first sub hypothesis of the first hypothesis of the study, which is: there is significant relation between E-CRM and customer satisfaction.

H₂: There is a significant relationship between E-CRM and Customer Satisfaction

2.7.3 Relation between E-CRM and Customer Loyalty

This section will examine the relationship between E-CRM and Customer Loyalty through some previous studies that the researcher has addressed on studying this relationship over the years from 2014 to 2021.

The continuous development of new technologies had reflected on the continuous changes of the needs of consumers. Therefore, organization had switched from Customer Relationship Management to the electronic Customer Relationship Management. Alim and Ozuem (2014) examined the effect of electronic Customer Relationship Management (e-CRM) on customer loyalty in the mobile industry. A case study of Vodafone Company was chosen as a representative of mobile industry in the United Kingdom. The findings indicated a significant impact of e-CRM on customer satisfaction.

Salehi et al. (2015) aimed to investigate the relation between electronic customer relationship management (e-CRM) and customer loyalty. Cross-sectional data was collected through a questionnaire, where the population was customers of Sepah Bank branches located in Isfahan city. SPSS and LISREL software were applied in the analysis. The results indicated a significant role of e-CRM in enhancing customer's loyalty.

Ismail and Yunan (2016) tested the role of service quality in enhancing customer loyalty inside the health sector. A self-report questionnaire was conducted that targeted patients at army medical centers located in West Malaysia. After distributing 400 questionnaires, a total of 128 responses were received (with response rate 32%). The outcomes of analysis indicated that there was a significant correlation between the dimensions of service quality (tangible, responsiveness, reliability, assurance and empathy) and both of customer satisfaction and customer loyalty.

Chang and Thai (2016) used a case study of Kaohsiung Port to evaluate the effect of port service quality on customer satisfaction and customer loyalty. For this purpose, a survey was done by the researchers targeting the shipping companies and freight forwarders located in Taiwan. Questionnaires were distributed among 1,188 managers and 134 responses were received and 106 of them were complete answers. The finding assured a direct positive impact of port service on both customer satisfaction and customer loyalty. In addition, it proved a direct positive influence of customer satisfaction on customer loyalty. Finally, the researchers suggested that Kaohsiung Port had to improve its service quality to be able to enhance customer satisfaction and loyalty.

Mang'anyi et al. (2017) evaluated the role of electronic customer relationship management (e-CRM) in enhancing customer loyalty. A major international bank located in Kenya was selected to collect a cross-sectional data, as a self-administered questionnaire was done. After using the convenience sampling, the final sample consisted of 78 questionnaires. The correlation and multiple regression analyses had proved a significant positive effect of pre-service, during service and post-transactional e-CRM on customer's loyalty. Therefore, e-CRM practices enhancement was considered as a significant tool in influencing the relationship of the bank with their customers.

Gong and Yi (2018) determined the impact of service quality on customer satisfaction, happiness as well as customer loyalty. The researchers depended on a comparative study, as it depended on five Asian countries to see if the same results will be concluded or no. Those countries were China, Hong Kong, Japan, South Korea, and Singapore. The researchers made a survey and the results of analysis proved that there was a positive influence of overall service quality on customer satisfaction, which led to gain customer loyalty and customer happiness.

Abror et al. (2019) purposed to investigate the factors that lead to customer loyalty. Those factors were service quality, customer engagement, customer satisfaction and religiosity. Survey was done that targeted customers of Islamic bank located in West Sumatra in Indonesia. The sample of the survey consisted of 335 responses. The results proved a positive significant relation between service quality and customer satisfaction. In addition, there was no significant impact of service quality on customer loyalty. Finally, a positive significant influence of customer engagement was proved on customer loyalty.

Shankar and Jebarajakirthy (2019) investigated the relation between service quality and customer loyalty in the banking sector in India. Banks always work on providing high-quality e-banking services aiming to attract and retain customers. Quantitative data was collected by making a structured questionnaire. This questionnaire targeted 1,028 e-banking Indian users. Structural equation modeling was conducted in order to analyze the gathered data. The findings proved that service quality had an influence on enhancing customer's loyalty.

Zia (2020) aimed to investigate the factors that affect customer's loyalty in the banking sector, by testing different variables, which were: service quality, satisfaction and attitude. The researcher conducted a questionnaire, which was distributed among customers of banks located at Albaha region in Saudi Arabia. The final sample consisted of 1097 responses. The analysis process was utilized through structural equation modeling and multiple regression. This analysis indicated that each of service quality, satisfaction and attitude had a significant impact on the loyalty of customers.

Fida et al. (2020) utilized SERVQUAL model to investigate the relation between service quality (assurance, reliability, responsiveness, tangibles and empathy) and customer loyalty. Quantitative method was utilized and data was collected through a questionnaire. The questionnaire targeted customers of five Islamic banks in Oman. The final sample consisted of 120 customers. Correlation and regression analysis was made, in addition data were analyzed using SPSS, and Cronbach's alpha. The correlation analysis proved that each of service quality and customer satisfaction was significantly related to customer loyalty. Moreover, the regression analysis assured a significant positive impact of empathy and responsiveness on customer satisfaction. Therefore, researchers suggested that banks should focus more on empathy and responsiveness to reach customers' satisfaction and loyalty.

Hussain (2021) studied the relation between service quality and customer loyalty. Data was collected through an online survey from the major mobile service providers and their users from Islamabad and Rawalpindi region. Online surveys were sent using google.doc and total of 261 responses were received. The outcomes of analysis indicated that customer satisfaction had a positive impact on customer loyalty. However, service quality has a significant impact on customer satisfaction. On the other hand, there was an insignificant influence of service quality on customer loyalty, where customer satisfaction played a positive significant mediating role in the relationship between service quality and customer loyalty.

Based on the previous studies that were illustrated, the researcher can develop the second sub hypothesis of the first hypothesis of the study, which is that there is significant relation between E-CRM and customer loyalty.

H3: There is a significant relationship between E-CRM and Customer Loyalty

2.7.4 Relation between Customer Satisfaction and Customer Loyalty

This section will examine the relationship between customer satisfaction and customer loyalty through some previous studies that the researcher has addressed on studying this relationship over the years from 2011 to 2020.

Mohsan et al. (2011) evaluated the influence of customer satisfaction on each of customer loyalty and his intention to switch. A questionnaire-based survey method was applied. Questionnaires were distributed among 120 bank customers in Pakistan. Those customers visited the banks counters as well as they had accounts with the serving of banks. Microsoft Excel and SPSS 16 were applied in analyzing the data. The finding revealed a positive correlation between customer satisfaction and customer loyalty. On the other hand, it proved a negative correlation with the customer's intentions to switch.

Saleem and Raja (2014) examined the relation between service quality, customer satisfaction and loyalty in Pakistan. The researchers targeted the hotel industry there and collect the data from 5- and 8-star hotels. Total of 250 questionnaires were distributed and the response rate was 86%. After analyzing the collected data using structural equation modeling, the outcomes indicated that high level of service quality led to achieving customer satisfaction. In addition, it was proved that customer satisfaction played a significant role in strengthening the loyalty of the customer.

Priporas et al. (2017) aimed to determine the link between service quality, customer satisfaction and customer loyalty in Thailand. The touristic field in Thailand was chosen because Thailand represents one of the top worldwide tourist destinations. Quantitative and primary data was the methods used in gathering data. Nonprobability sample was used to select the sample of the self-administered questionnaires. The final sample consisted of 202 international tourists in Phuket, Thailand. The analysis proved that service quality, customer satisfaction, and loyalty were positively related. In addition, a partially mediating effect of satisfaction was proved in the relation between service quality and loyalty.

Biscaia et al. (2017) investigated the impact of customer satisfaction on customer loyalty in the retail store. A survey was conducted to gather data of the required variables, this survey was based on the European Customer Satisfaction Index model in the retail store at Portugal. Survey was distributed at the first quarter of 2013 and 117 responses were received. The researchers utilized structural equation modeling, based on a partial least square in order to analyze the collected data. The findings showed that customer satisfaction had a positive influence on customer loyalty in the retail store. In addition, the results confirmed a strong direct impact of the image construct on satisfaction, which reflected on direct or indirect influence on the loyalty.

Rather and Sharma (2017) studied the role of customer satisfaction and customer commitment in enhancing customer loyalty. Questionnaires were done to collect data from customers of four- and five-star hotels located in Jammu and Kashmir in India. The sample of this research was chosen by utilizing simple random sampling technique. After distributing 120 questionnaires on customers, total of 112 responses were received (with response rate 93%). The findings proved a positive influence of both satisfaction and commitment on customer loyalty. Therefore, the researchers suggested for hospitality managers to pay more attention to increase the satisfaction and commitment of customers in order to generate competitive advantage and gain the loyalty of the customers.

Aisyah (2018) determined the relation between service quality, customer satisfaction and customer loyalty in the Islamic banks. Likert scale questionnaire was done to collect primary data regarding the required variables. This questionnaire targeted customers of Bank Syariah Mandiri in South Jakarta, Indonesia, where the final sample consisted of 100 customers. Path analysis was done in order to test the direct relation, while Sobel analysis was done for the indirect impact. The outcomes concluded that service quality had an impact on both customer satisfaction and loyalty. Moreover, the results showed that customer satisfaction had no direct or indirect effect on customer loyalty.

Schirmer et al. (2018) investigated the effect of customer satisfaction on loyalty. In addition, they examined the mediating influence of customer characteristics in the above relation. Face-to-face interviews were done with 749 individuals of gasoline retailers. FIMIXPLS and PLS-MGA analyses were done. The results proved a significant relation between customer satisfaction and loyalty. The results also assured of the mediating role of trust and commitment in the relationship between satisfaction and loyalty.

Raza et al. (2020) studied the structural association of Internet banking service quality on customer satisfaction. They also determined the effect of customer satisfaction towards customer loyalty. Quantitative method was applied, by making structured questionnaire. The population included of 500 clients of banks located in Pakistan. PLS-SEM, convergent validity and discriminant validity was conducted. The analysis concluded a positive significant relation between service quality and customer satisfaction. In addition, it proved positive significant effect of customer satisfaction on customer loyalty.

Based on the previous studies that were illustrated, the researcher can develop the second hypothesis of the study, which is that there is significant relation between customer satisfaction and customer loyalty.

H3: There is a significant relationship between Customer Satisfaction and Customer Loyalty

2.7.5 Relation between Customer Satisfaction and Port Performance

This section will examine the relationship between Customer Satisfaction and Performance through some previous studies that the researcher has addressed on studying the relation between customer satisfaction and performance over the years from 2011 to 2020.

Williams and Naumann (2011) investigated the relationships between customer satisfaction and performance of the company at the firm-level of analysis. Longitudinal data was collected through a series of quarterly surveys that had examined the attitudes of customers and its effect on company performance. This longitudinal data targeted one large Fortune 100 company and collect the data over a five-year period. Moreover, these data were analyzed using several statistical tests of association. The findings indicated a significant relation between customer satisfaction and company performance. In addition, customer satisfaction was proved to have a strong link with earnings per share, retention, stock price, revenue and Tobin's q .

Sun and Kim (2013) aimed to investigate the influence of customer satisfaction on the performance of the firm. The researchers saw that this relation was neglected in the previous studies. Therefore, the researchers made their research and they focused on the hospitality and tourism industry (i.e., hotels, restaurants, and airlines). Secondary data was collected about American Customer Satisfaction Index (ACSI) from the official website of the American Customer Satisfaction Index. Finally, the analyzed data proved a positive significant effect of customer satisfaction on firm performance.

Kangogo et al. (2013) purposed to find out the impact of customer satisfaction on performance. The researchers chose the hotel industry, as it represented one of the fastest global growth sectors in the economies. A descriptive research design was conducted, as a questionnaire was done. After using simple random sampling technique, the final sample consisted of 24 participants from two major hotels located at the western tourism circuit in Kenya. Descriptive statistics was utilized to analyze the data. The findings assured that hotel always work on meeting customers' expectations aiming to reach their satisfaction and loyalty.

Finally results showed a significant effect of customer satisfaction on hotel's performance.

Suchánek et al. (2015) examined the relation between customer satisfaction and business performance in the food industry context. Customer satisfaction was defined by the researchers as customer's feeling to be satisfied with a product, service and the business performance as a method that helps him to gain his profit. Data was collected using different ways, as business performance was measured using financial data, while satisfaction was measured using a questionnaire. The process of gathering data was done during the period January till February 2013, while the sample was 18 enterprises working in the food industry context. The results of analysis proved a significant impact of customer satisfaction on business performance.

Otto et al. (2020) examined the role of customer satisfaction in enhancing firm performance. Secondary data was gathered, depending on previous empirical research that had examined the relation between customer satisfaction and business performance through the period 1991 till 2017. After that the researchers began the analysis process, where 251 correlations were conducted from 96 studies. The analysis had proved that customer satisfaction had a positive effect on firm performance.

Based on the previous studies that were illustrated, the researcher can develop the third hypothesis of the study, which is that there is significant relation between customer satisfaction and port performance.

H4: There is a significant relationship between Customer Satisfaction and Port Performance

2.7.6 Relation between Customer Loyalty and Port Performance

This section will examine the relationship between Customer Loyalty and Performance through some previous studies that the researcher has addressed on studying this relationship over the years from 2016 to 2020.

Vilkaitė-Vaitonė and Papšienė (2016) investigated the importance of adopting customer loyalty programs in enhancing the business performance. The researchers depended on several methods to collect and analyze the data as systemic analysis of scientific literature, comparative analysis, secondary data analysis, content analysis. The targeted sample was a sample of airlines located in the Baltic States (Estonia, Latvia and Lithuania). The findings of analysis indicated that the airlines, which have customer loyalty program succeeded in attracting higher number of passengers than their competitive ones. On the other hand, there was no significant statistical impact was proved between customer loyalty and airlines' revenue, profit.

Boonmalert et al. (2020) studied the market orientation and customer loyalty and their influence on business performance. In addition, they investigated the mediating role of loyalty on the relation between orientation and performance. This research targeted the rice industry in Thailand and collected primary data through a questionnaire. The final sample contained 255 questionnaires collected from employees at various companies. Statistical software analysis was conducted named Partial Least Square. Results assured of a positive effect of market orientation on the companies' business performance (especially in the rice industry). The analysis also included a significant effect of customer loyalty towards business performance.

Rashid et al. (2020) analyzed the effect of both service quality and customer loyalty on the performance of banks in Bangladesh. To reach this aim, the researchers collected primary and secondary data. Primary data was gathered by making a questionnaire. The process of collecting the questionnaire data took place through the period from May till June 2018. Questionnaires were written in Bangla language and distributed among 500 customers at 8 Islamic banks, while 356 complete answers were collected (with response rate 71.2%). On the other hand, secondary data was collected from annual reports. Rigorous statistical techniques were applied. The analysis assured that service quality had significantly positive impact on customer loyalty. The analysis also assured that customer loyalty had no any significant relation with the performance of Bangladeshi Islamic Banks.

Sampaio et al. (2020) assumed that there was a relation between market orientation, customer loyalty and business performance. To prove this assumption an empirical analysis was applied, which depend on a sample of hotels at six Western European countries. Surveys were mailed to the managers of those hotels and the findings proved a positive direct impact of market orientation on business performance. In addition, a positive impact was proved from customer loyalty to the business performance. Therefore, customer loyalty could mediate the relation between orientation and performance. Based on the previous studies that were illustrated, the researcher can develop the fourth hypothesis of the study, which is that there is significant relation between customer loyalty and port performance.

H₅: There is a significant relationship between Customer Loyalty and Port Performance

Conclusion

With the latest technological advancements, CRM development has increased dramatically, which later became e-CRM that makes it easier for CRM to improve customer service by reducing costs, increasing efficiency and effectiveness of the company in serving customers. E-CRM has proven to cut costs and its implementation is very fast compared to traditional CRM that takes a lot of time and money. There are 14 literatures reviewed, 7 of which contain reviews of the latest e-CRM and 7 of which contain reviews of technology in e-CRM that are divided into four namely Interactive Voice Response (IVR), bots, virtual customer representatives and web phones (IP Telephony / VoIP).

Each review has its own future research, which can be an insight for the researchers to make this research as a reference material for future research, both academically and practically. Overall, this literature review shows a case of shifting in the CRM world. The old traditional CRM will soon be useless to achieve customer satisfaction or loyalty. The e-CRM implementation needs to be in place to achieve a customer centric environment.

This chapter primarily focused on developing and justifying the research model through the literature discussed on E-CRM, Customer satisfaction, loyalty and port performance. A conceptual model was presented describing the link between the constructs and seven hypotheses developed.

H₁: E-CRM has a Significantly Positive Impact on Port Performance

H₂: E-CRM has a Significantly Positive Impact on Customer Loyalty

H₃: E-CRM has a Significantly Positive Impact on Customer Satisfaction

H₄: There is a Significant Relationship between Customer Satisfaction and Customer Loyalty

H₅: Customer Satisfaction has a Significantly Positive Impact on Port Performance

H₆: Customer Loyalty has a Significantly Positive Impact on Port Performance

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This research aims to study the impact of E-CRM on Egyptian Port Performance through customer satisfaction and customer loyalty. Therefore, this chapter defines the methodology that was chosen in order to reach the answers to the research question and to achieve the research objectives. Research methodology is the way in which different theories, ideas and concepts are gathered so that they can be related to a specific field (Almalki, 2016). The research methodology includes some public and private activities such as reviewing the literature to identify problems, formulating hypotheses and conducting tests for them, measuring, analyzing and collecting data, and interpretation and drawing conclusions. Moreover, one of the benefits of understanding and mastering research methodology is an enhanced understanding of research activities (Basias and Pollalis, 2018).

Research methodology is a systematic process that helps the researcher to conduct research systematically. It is the process of gathering different ideas, theories and concepts so that the researcher can relate them to a specific field of

research. Research methodology is a system that contains different methods that a researcher can follow to conduct his research in order to achieve the research goal and objectives. A methodology is a section in which the concepts, principles, and procedures applicable to the research are clarified (Matthews and Ross, 2014). Research methodology is the process that helps the researcher to conduct research systematically, and it is also the process of collecting various ideas, theories and concepts so that the researcher can relate them to a specific field of research. The research methodology is also the system that contains different methods that the researcher can follow to conduct the research, in order to achieve the objectives and goal of the research (Andrew et al., 2019).

Research methodology is the procedures and process used to analyze a scientific research. It includes the philosophy, approach, design adopted in the research, the methods of data collection, selection of the sample, type of data analysis and the framework of the research. All these are illustrated in detail in the following sub-sections. The research methodology is the theoretical and systematic analysis of the methods applied in the field of study and presents the description of the research process. It includes different theories, concepts and ideas that the researcher can relate to a specific field of research.

The researcher explains the concepts, principles and procedures and applies them to the research in the methodology section, and provides information about the method that was used in conducting this research, as well as the justifications that prompted him to use this method (Lauckner et al., 2012). In the next sections, the researcher attempts to distinguish the methodology of the research that is utilized to analyze and test the research hypotheses and clarify the outcomes through testing the research sample (Sekaran and Bougie, 2016).

The dissertation starts with literature review of previous studies which have sought to explain the link between firm performance, customer satisfaction, loyalty and CRM in different service sectors. It then identifies and links the relationship between the three constructs to port performance. A quantitative research approach through use of questionnaire survey is used to answer the research questions and achieve the objectives of the study. Egyptian port customers and employees are used as the case study of the research for data collection, analysis and findings. Descriptive statistics is used to describe the findings and regression analysis used to describe and evaluate the relationship between the constructs.

It has been taught and known that there are some procedures and methods that should be followed by any researcher or practitioner. Researchers should identify the philosophy that had been followed for the research, such as positivism (objectivism), Interpretivism (constructionism) or pragmatism (realism). Then, the research approach should be identified accordingly, whether it would be deductive, inductive or mixed approach between both. A next step is to figure out the design of the research that might be quantitative, qualitative or mixed, depending on the followed philosophy and approach of the research (Saunders et al., 2018). There are three approaches to research project development: inductive, deductive and mixed. In inductive thinking, researchers use a theory and deduce hypotheses and then convert them into terms. This type of deductive reasoning is used to experimentally test hypotheses, either to accept or reject them. On the other hand, deductive research arises when there is a gap in the logical argument between observations and conclusions. Therefore, this chapter is divided into several section, each section clarifies part of the methodology follow in the study. Section (1): represents the chapter introduction. Section (2): introduces the research philosophy. Section (3): illustrates the research approach. Section (4): demonstrates the research design. Section (5): clarifies the study framework and its hypothesis. Section (6): determines the study variables. Section (7): selects population and sample of the study. Section (8): shows types of data collections and chooses the better type to be used in this research. Section (9): explains research time horizon. Section (10): reports analysis techniques, which will be employed in the study. Section (11): Summarizes the chapter and includes the chapter conclusion.

3.2 Research Philosophy

The philosophy of any research is one of the most important things that the researcher must explain from the beginning very clearly, as it was said that the philosophy of research is the method of thinking and the basis of any interpretation or research, so in this chapter the researcher will try to clarify what you mean by the philosophy of research and the type of different approaches and which one has been chosen In this research, however, there is a necessity first to separate between scientific research and non-scientific research, as for nonscientific research is the daily participation and questioning of all individuals in society without the need for equipment or the use of logic or scientific explanation or some way to separate the phenomenon from our daily interaction with it. There are many philosophies based on this question, so the following philosophies must be explored first as there are many existing philosophies positivism, interpretivism and realism (Ryan, 2018).

First, **Realism**: realistic philosophy believes that there is a real world out there to discover and that it is set of objects interrelated with each other. To analyze a phenomenon, realists usually first start with a prior theory and then they collect the data, so they enter with prior knowledge and then search for reality. Therefore, they are considered one of a set of windows to the reality out there (Chakravartty, 2011).

Second, **Interpretivism**: depends on the difference between the social sciences and the natural sciences as it aims to explain how the phenomenon occurred and follow it from its inception to its current form and explain its occurrence by

searching for the causes that led to its occurrence or to verify the validity of the assumptions that were put as an explanation for it and notes that the process of interpretation follows description process, which requires attention to the existence of a particular phenomenon or problem; Which makes us try after we define it, and define its elements, and its relations with others; Access to their causes (Bell et al., 2018).

Third, **Positivism**: returns to the French philosopher August Comte's philosophical ideas. Positivists view that factual knowledge that is gained through observation is trustworthy. They believe there is a truth beyond any phenomenon in the world and that the world is controlled by unchanging and fixed laws and rules. They always seek to discover that truth to understand the social phenomena by looking for casual relationships. They look for facts or causes of the phenomena, so they are more concerned with hypothesis testing (Wahyuni, 2012).

Positivism philosophy is considered a strategy that tends to explain and predict what is happening in the social world by searching for consistency and causal relationships between its basic elements. As it focuses on facts and relies on true knowledge of the sensory experience obtained by observing, controlling experiments and measuring to achieve reliability. Positivism philosophy tends to explain and predict what is happening in the social world by searching for consistency and causal relationships between its essential elements. Positivism philosophy is related to experiments and quantitative research. Positivism philosophy believed that knowledge should be objective and free from any bias stemming from the values and beliefs of the researcher (Burell and Morgan, 2017).

The positivism philosophy initially began as the philosophical stance of the natural scientists then has been entailed with the social scientist. The main idea of positivists is the law of generalization. Therefore, this study follows positivism philosophy as positivism philosophy relied on descriptive analytical method that is commonly used in studies describing the current reality of the phenomenon with the intention of knowing whether this reality is valid or whether it needs to make changes.

3.3 Research Approach

Research approach is the process of selecting appropriate tools to collect and analyze research data. The research approaches have three broad approaches that any research study adopts whether deductive or inductive approach or mixed approach (deductive approach and inductive approach). The appropriate approach to the study is chosen based on the aim of the research and the philosophy that was followed in order to solve the research problems.

First, **Inductive approach**: is data analysis where the researcher searches for explanations of phenomena by following the collection of data so that they do not find any cases that are consistent with the interpretation of the existing phenomena. The inductive approach is presented as inductive inference inverted with notes on certain facts or detailed phenomena and changes towards generalizations and abstract ideas contained in the conclusions to generate new theories to explain that phenomenon.

Second, **Deductive approach**: is considered one of the approaches to developing the theory and it generalizes the theory starting from the general to the specific as it begins with a specific fact and then studies the case until it reaches a specific conclusion. As long as the theory is correct, the conclusion is certainly correct as it clarifies the relationship between theory and research as the research is conducted with reference to the hypotheses and ideas inferred from the relationship. As when the introductions are correct, the results are also true, so the deductive approach depends on the validity of the introductions (Zalaghi and Khazaei, 2016).

Under the deductive logic when the premises are true, the conclusion must also be true. It begins with specific known premises to move forward to clear general evidence and conclusions. this approach is using for Generalising from the general to the specific and moving from theory to data. The need for the deductive approach is to explain causal relationships between variables. It is a systematic approach for generating knowledge to solve basic and managerial problems. Data collection is used to evaluate propositions or hypotheses related to an existing theory which is a quantitative data collection. The researcher who is using this approach will be independent of what being researched (Saunders and Lewis, 2016).

In this research, the main aim is to clarify the effect of E-CRM on Egyptian Port Performance through customer satisfaction and customer loyalty. Therefore, deductive approach will be the approach of the research as it will reach conclusions and results based on the meaning and the analysis of the records and data collected to prove the theory and answer the questions of the research.

3.4 Research Design

The research design sometimes called the methodological choice means that it is a plan that clarifies how researches are going to answer the research questions and specify how they can collect the data that they are going to analyze. Researchers have three popular designs: the qualitative, quantitative and the mixed approach. Each of these options is likely to call a different mix of elements and procedures to achieve the research design. Each one of them belongs to a specific philosophy and approach. Consequently, researchers' fundamental beliefs about the world and the pursuit of

knowledge will be reflected in the way they design their research, the way they collect and analyze data, and even the way they present their findings or write their dissertations.

First, **Qualitative approach:** It is a method of research that observe, understand and interpret the phenomena without depending on numbers. Therefore, from the word qualitative, it is clear that it deals with qualities rather than quantities. The data used is qualitative which means not characterized by numbers but on free form or unstructured data such as texts, experiments, questionnaires or surveys, data is collected through open-ended questions in a form of words. It involves five designs; ethnography study, case study, grounded theory study, phenomenological study and content analysis (Williams, 2007). Qualitative research design is concerned with non-numerical information and the data used is qualitative, which means that it is not distinguished by numbers but in free form or unstructured data such as texts, experiments, interviews or surveys (Almalki, 2016).

Second, **Quantitative approach:** attempts to understand the relationships between different constructs and quantify the data collection and analysis procedures (Sekaran and Bougie, 2016). The emphasis is on collecting, analyzing, and presenting numerical data in a structured manner using statistical techniques. In other words, quantitative research from its word deals with quantities and numbers. The data is usually collected through structured questions. It is conclusive method of research, which means its aim is to test a specific hypothesis with relevant numbers and statistics, come up with exact relationships, and provide numerical facts. Therefore, quantitative research is objective which means it does not depend on who compute the data, the results does not change so it gives reliable conclusion. It usually deals with large sample and analyzes it (Creswell, 2017).

The data is usually collected through structured questions. It is conclusive method of research, which means its aim is to test a specific hypothesis with relevant numbers and statistics and come up with exact relationships and provide numerical facts. Therefore, quantitative research is objective, which means that it does not depend on who computes or computes the data since the results do not change, it gives a reliable conclusion, handles and analyzes large samples (Almalki, 2016). The quantitative approach simply sees the world as an external, objective and independent part of the researcher. Science is the absolute value as it seeks causation and essential facts using statistics to reach an objective point of view. There are some characteristics of the quantitative approach: such as tending to produce numerical data. A large sample size is used, the degree of confidence is high (does the measurement have the same result on different occasions or not?), The degree of validity is low

(as it depends whether the tools used in the measurement are correct or not?), depends on testing the validity of the hypotheses, the data are clearly specified Explicit, automated workplace (Antwi and Hamza, 2015).

This study uses the quantitative method, which relies on data that results in numbers in explaining effect of E-CRM on Egyptian Port Performance through customer satisfaction and customer loyalty as the researcher will distribute a questionnaire among users of MENA Ports. The quantitative approach is generally related to positivism philosophy, used to examine the relationship between variables, measured numerically and analyzed using statistics and graphs, and it is always related to the deductive approach of the theoretical test.

3.5 Research Framework and Hypothesis

The literature revealed that the characteristics of three stages of a transaction cycle, namely, pre-transaction, during-transaction and post-transaction which constitute e-CRM, impact on customer loyalty. The dependent variable is concerned with the purchase and user behavior, attitudes towards the product and the purchasing or service consumption situation. Recent studies (Abdulfattah, 2012; Sivaraks et al., 2011) postulated that e-CRM features influence customer satisfaction, service quality and loyalty. In addition, (Alim and Ozuem, 2014) and also (Peštek and Lalović, 2012) reiterated that e-CRM characteristics are effective in reinforcing relationships with customers, and promoting the development of an attractive virtual community which significantly impacts satisfaction and loyalty. (Tauni et al., 2014) postulated significant relationships between CRM and customer retention.

Customer loyalty is explained as an intense commitment within customer, which results in repurchase and re-patronize a product or service consistently in the future (Oliver, 2014). Customer loyalty is an important dimension for explaining customer withholding and is determined by a combination of repurchase and affection for the retail store which, in turn, have an influence on CS (Amin, 2016). Although there is sufficient evidence from past researches that customer satisfaction is linked with customer loyalty, not all researchers are of the opinion that not all satisfied customers will be loyal, neither will be dissatisfied store (Rashid and Rokade, 2019) did an extensive study on the relationship between satisfaction and loyalty. Based on the above literature, the following hypothesis-based framework is proposed in Figure 3-1.

This research aims to study the impact of E-CRM on Egyptian port performance through customer satisfaction and customer loyalty. Therefore, E-CRM was used as an independent variable in the study, which is measured by both Service quality / Customer value. As for the independent variable of the study, it is Egyptian port performance through the two mediating variables, namely, customer satisfaction and customer loyalty.

Figure 3-1 illustrates the research framework and details the proposed hypotheses which will be tested and measurement items which will be used to measure the constructs as developed in the literature review in this study.

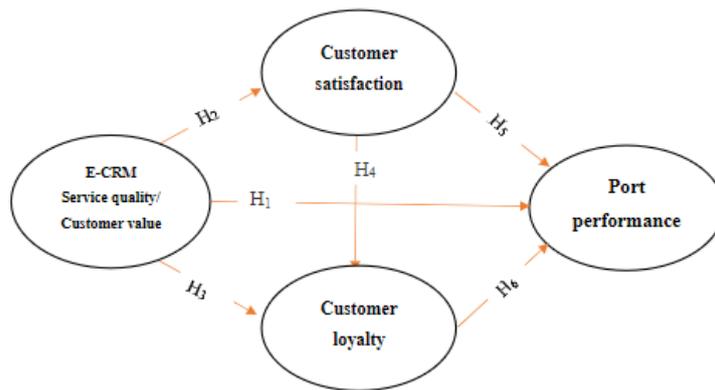


Figure 3- 1: Study Conceptual Framework

It is conceptualized that CRM through quality services and customer value yields satisfied and loyal customers who in turn add to profits of the organization (Amoako et al., 2012). CRM strategies are developed to provide port managers with sufficient knowledge regarding their customers’ needs and facilitate quick response in terms of their continuous value creation and delivery. These propositions are platforms of customer satisfaction. On basis of this review, this justifies the relationship provided for in the framework. Therefore, the study hypotheses are developed and tested as shown:

- H1: E-CRM has a Significantly Positive Impact on Port Performance**
- H2: E-CRM has a Significantly Positive Impact on Customer Satisfaction**
- H3: E-CRM has a Significantly Positive Impact on Customer Loyalty**
- H4: There is a Significant Relationship between Customer Satisfaction and Customer Loyalty**
- H5: Customer Satisfaction has a Significantly Positive Impact on Port Performance**
- H6: Customer Loyalty has a Significantly Positive Impact on Port Performance**

3.6 Research Variables

The research variables are classified as follows:

- ✦ **Dependent variable:** Port Performance.
- ✦ **Mediators:** Customer Satisfaction and Customer Loyalty.
- ✦ **Independent variables:** Electronic Customer Relationship Management (*E-CRM*).

The research variables were measured according to a questionnaire adopted from previous studies (Rashid and Tahir, 2013; Bataineh, A.Q., 2015; Rashwan et al., 2019; Dehghanpouri et al., 2020), with a 5-points Likert scale, as shown in Table 3-1.

Table 3- 1: Research Variables Operationalization

Variables	Statement
E-CRM (Dehghanpouri et al., 2020)	- Complaints (suggestive) promotes and encourages customers to share problems when they arise
	- If possible, the needs of customers are reviewed and responses are made on an individual basis
	- This port has the right technical personnel to provide technical support for the utilization of computer technology in building customer relationships
	- This port has the right software to serve our customers Complaints (responsiveness) customer complaints are reviewed and acted on swiftly
	- The site of this port enables me to complete a transaction quickly
	- It tells me what to do if my transaction is not processed
	- I think that the reputation of the port in terms of security is important
	- I am satisfied with interpersonal communication provided by my port through its online channel.
Customer Satisfaction (Bataineh, A.Q., 2015)	- I am satisfied with electronic direct mail provided by my port through its online channel.
	- I am satisfied with perceived rewards provided by my port through its online channel.
	- Overall, I am very satisfied with all services provided by my port through its online channel.
	- I seldom consider switching to another Web site.

Variables	Statement
Customer Loyalty (Rashwan et al., 2019)	- If the present service continues, I doubt that I would switch Web sites.
	- I try to use the Web site whenever I need to make a purchase.
	- When I need to make a purchase, this Web site is my first choice.
	- I like using this Web site.
	- I intend to continue using the online port.
	- I prefer the online port above others.
	- I would recommend the port's website to others.
	- I would like to say positive things about online port to other people.
	- I would recommend online port to someone who seeks advice.
Port Performance (Rashid and Tahir, 2013)	- Improve employee's problem-solving ability
	- Improve employee's service quality
	- Improve employee's intention to learn
	- Effectively promote corporate culture
	- Increase market share
	- Increase operating efficiency
	- Reduce customer complaint
	- Improve the ability to retain old customers
	- Improve the ability to confirm target customers
	- Increase sales growth rate
	- Satisfy needs of various types of customers
	- Increase customer intention to purchase
	- Increase customer satisfaction
	- Reduce total cost of the hotel
	- Reduce unexpected losses
- Increase return on assets	
- Increase net profit margin	

3.7 Research Population and Sample

Research population defined as the accumulated number of all objects or individuals of interest in which a set of specifications and characteristics are compatible, and through which data can be collected and analyzed. Usually, obtaining data about all members of the population is not available and is very difficult (Acharya et al., 2013). Therefore, the target group must be identified, which is the group to which the study is applied or who is in a position to answer the questions and apply the results of the questionnaire (Sekaran and Bougie, 2016). According to the current research, the targeted population are the users of MENA Ports.

As it is difficult to determine the number of populations in this study, the researcher depends on 95% confidence level rule in determining the sample size, which means that the total sample size will be 385 questionnaires, According to (Saunders and Lewis, 2016). Moreover, the researcher used a non-random sample technique, which is the convenience sample. The convenience sample technique is a non-probability sampling technique, in which the chosen sample is selected because of their convenient accessibility and proximity to the researcher (Gerlich et al., 2018). Accordingly, the convenience sample is a non-random technique; therefore a diversification was done in the sample in order to overcome the problem of preventing the generalization of the results.

Accordingly, the researcher depends on a questionnaire design that targeted a population of users of Mena Ports, where a non-random sample of 385 users will be chosen and questionnaires will be distributed.

3.8 Data Collection

There are two types of data, the first one is called secondary data, which means that data was already collected by someone else for a specific purpose, then the researcher reuses the data for the sake of his own research. Another type of data is called primary data, which means that data is collected by the researcher for the sake of the current research and it had been collected before, like, surveys, interviews, questionnaires and experiments.

First, **Surveys:** is a means of 'gathering data about the characteristics, actions and opinions of a large group of people'. Data is collected by means of self-completion questionnaires or structured interviews. A large amount of data is collected and is a cross section of the sample being surveyed at one point in time. Surveys collect data from a set sample of people and there are a variety of sampling methods to achieve this. The advantages of surveys include being able to collect large amounts of data, ensuring anonymity of respondents, showing relationships between the data and being seen as a valuable descriptive and explorative method of research design. The data collected can be either qualitative or quantitative (Harkness, 2012).

Second, **Interviews:** It is considered one of the most known and commonly used of these methods. An interview can be defined as a method of data collection in which questions are asked by an interviewer to respondent(s). As considering interview a way to collect data and gain knowledge from individuals, it can be done in many ways either face-to-face or

by telephone. Interviews consist of a standard list of questions but the interviewer could follow the lead of interviewees or ask them additional questions to seek more detailed responses (Polit and Beck, 2010).

Third, **Experiments:** True experiments are characterized by random assignment of subjects to experimental conditions and the use of experimental controls. While, Quasiexperimental studies share almost all the features of experimental designs except that they involve non-randomized assignment of subjects to experimental conditions. experiments are conducted over long periods of time, they are more susceptible to the effects of history due to changes in population, attitudes, economic patterns, etc. (Zikmund et al., 2013).

Fourth, **Questionnaires:** It is a survey method for collecting data. Questionnaires can provide a good surface picture of a situation but do not offer the same in-depth analysis of a problem as other research methods. The advantages are that they can be used to gather background information; they can reach many people and are reliable. The main disadvantage of questionnaires over using interviews is that a response from those sent a questionnaire is not guaranteed. Questionnaires only provide superficial information and respondents do not necessarily complete all the questions.

Thus, this study adopted the structured questionnaire that includes closed ended questions to obtain the quantitative data. A questionnaire is applied to confirm some factors and, besides, having an overall image of the participants' answers, to be able to answer the proposed research questions, this study used quantitative data collection method in the form of a structured, close ended questionnaire.

3.9 Time Horizon

Time horizon includes three types: time series data, cross section data, and panel data. **Time series data**, which is data that collects the same variable at regular intervals (weeks, months, years), allowing the researcher to study the effect of variables on short- or long-term periods of time (Sekaran and Bougie, 2016). **Cross-sectional data**, which is data that includes the study of a specific phenomenon or several phenomena at a given time. Cross-sectional studies often use a survey strategy, as they explain how factors are related in different organizations (Saunders et al., 2012). Finally, **the panel data** collected can track changes over time. The researcher may study the same people over time (Cooper and Schindler, 2014).

In this research, the researcher studies the effect of E-CRM on Egyptian Port Performance through customer satisfaction and customer loyalty in MENA Ports. Research may be time constrained or "snap shot" research, which is called cross sectional study or it, may be with longer time duration or diary or "series on snap shots". This research is a cross sectional study.

3.10 Framework for Data Analysis

The collected primary data from the questionnaire are analyzed through descriptive analysis. The mean, median, variance, range and standard deviations are calculated for the research variables. Then, the correlation between the research variables is estimated by the correlation matrices using the correlation coefficients. Afterward, the research hypotheses are tested by conducting the regression model between these variables, as well as testing the major econometric problems as normality, autocorrelation, multicollinearity and heteroscedasticity.

Descriptive Analysis: in the descriptive analysis of data, the researcher defines collecting the vocabulary of the statistical study, organizing and arranging them, and then presenting them in a table or graph, including the arithmetic mean, median, mode, dispersion, standard deviation and range, etc., and contribute to knowing some measures of the data after collecting.

Data Validity and Reliability Test: It is the first test that must be approved in the study, as they are two conditions that must be met in order to start using the data to test the study hypotheses. Measuring data validity means the extent to which an instrument measures what should be measured correctly (Sekaran and Bougie, 2016). Through the application of factor analysis, the researcher used the convergent reliability test. The convergent validity examines the data using factor analysis (a multivariate technique) that tests the applicability of theoretical dimensions (Sekaran and Bougie, 2016).

Convergent validity was necessary to ensure that the elements measuring the same structure were highly correlated (Hair et al., 2016). In order to test for convergent validity, the average extracted value (AVE) must be calculated for each measure, which represents the mean population for each latent factor. In a suitable model, when the AVE is greater than 0.5, this means that the factors explain more than half of the variance in their respective indices (Hair et al., 2016).

Regression Analysis: is considered as a parametric statistical procedure that is widely used to predict the value of one dependent variable based on the value of one or more independent variables. It is also used to realize which one of the independent variables is linked and related to the dependent one, and to explain the types of forms of these relationships. The regression analysis was primarily used to test the research hypotheses of this study by measuring the significance of the impact of the independent variable/s on the dependent variable (Sekaran and Bougie, 2016). By regression, researcher

tried to find what is the shape of the relation between them? In other word, how could the relation be drawn? In other word, the regression equation is used to predict the value of a dependent variable from one or more independent variables.

Correlation Analysis: Where the Spearman or Spearman correlation coefficients are used to describe the relationships between variables according to the normality test. Correlation is used to find the correlation between two or more variables. The value of Spearman's correlation can fall between 0 (no relationship) and 1 (ideal correlation). The Spearman correlation analysis and the descriptive statistics will be directed to the investigation of hypotheses and to test the direct relationship between an independent variable and a dependent variable.

Testing Regression Assumption: This section investigates and verifies the regression assumptions for the above conducted models. The problems of multicollinearity, autocorrelation and heteroscedasticity are discussed below.

– **Residual Normality:** use the normality test to see if the residual value of the regression model has a normal distribution. The normal distribution is tested using the PP Plot technique and a look at points around the diagonal line are examined. If the points spread around the diagonal line and follow the direction of the line, then the regression model fulfills the normality assumption. Otherwise, if the points are scattered away from the diagonal line or do not follow the direction of the line, then the regression model does not satisfy the normality assumption (Suryani et al., 2018).

– **Multicollinearity:** is the relation between two or more variables, this relation is also called collinearity and ill-conditioning. In multicollinearity, the strength of independent variables and their impact are not reliable, and the high multicollinearity in the independent variable led to a disturbance in data, so it is concluded that multicollinearity is a state of unacceptable high intercorrelation between the independent variables. Multicollinearity test can be measured by using Variance Inflation Factor (VIF), if the value is greater than or equal to 5, then there is a problem of multicollinearity (Dormann et al., 2013).

– **Autocorrelation:** is a pattern over time series of the variable's values, those values can be autocorrelated in a positive or negative way, the first-order autocorrelation can be tested by Durbin-Watson test. Residual's variables independence is one of the assumptions of the ordinary least square model (Odland, 2020).

– **Heteroscedasticity:** means that there is an unequal variance of residuals regression over time. On the other hand, homoscedasticity sees that the relations of the study issue are similar to the whole range of the dependent variable, large residuals in some parts of the range compared to other parts means that there is a lack of homoscedasticity. So, heteroscedasticity is a violation of data to statistical assumption, this assumption is homoscedasticity. Graphically, if a standard scatterplot is noticed, this means that there is heteroscedasticity in the model (Rosopa et al., 2013).

– **Structural Equation Modelling (SEM):** includes a variety of mathematical models, computer algorithms, and statistical methods that fit structure networks to data and SEM includes confirmatory factor analysis, path analysis, partial least squares of pathways and latent growth modeling. Structural equation models are often used to evaluate unobservable "latent" combinations. They often call a measurement model that identifies latent variables using one or more observed variables, and a structural model that attributes relationships between latent variables (Kline, 2015).

3.11 Pilot Study

Pilot study represents a fundamental phase of the research process. The purpose of conducting a pilot study is to examine the feasibility of an approach that is intended to be used in a larger scale study. Data validation involves examining data for validity and reliability. Validity test is considered the most significant requirement for the quality of a test. If a test has high validity, this means that the items are closely related to the test's objective. On the other hand, if a test has low validity, then this is an indicator that the items are poorly related to a specific job. There are two main factors measuring validity: Average Variance Extracted (AVE) that should be greater than 0.5 and Factor Loading (FL) for each item that should be greater than 0.4 for high validity.

In addition, reliability Test is an essential element for test quality. It indicates the consistency of a measure. The higher the reliability, the better is the test. The most common test used for reliability is observing the value of Cronbach's Alpha. The coefficient of Cronbach's Alpha varies between 0 and 1. The higher the coefficient near to 1, the higher the reliability. If the coefficient is higher than 0.7 then it is adequately reliable. The sample size used in the pilot study around 40 valid questionnaires.

Table 3- 2: Pilot Study for Research Variables

Variables	Statement	Factor Loading	AVE	KMO	Cronbach's Alpha
E-CRM	1. Complaints (suggestive) promotes and encourages customers to share problems when they arise	0.828	75.239	0.719	0.815
	2. This port has the right technical personnel to provide technical support for the utilization of computer technology in building customer relationships	0.608			
	3. This port has the right software to serve our customers Complaints (responsiveness) customer complaints are reviewed and acted on swiftly	0.817			
	4. The site of this port enables me to complete a transaction quickly	0.780			
	5. It tells me what to do if my transaction is not processed	0.717			
	6. I think that the reputation of the port in terms of security is important	0.770			
Customer Satisfaction	7. I am satisfied with interpersonal communication provided by my port through its online channel.	0.758	73.375	0.686	0.975
	8. I am satisfied with electronic direct mail provided by my port through its online channel.	0.680			
	9. I am satisfied with perceived rewards provided by my port through its online channel.	0.738			
Variables	Statement	Factor Loading	AVE	KMO	Cronbach's Alpha
	10. Overall, I am very satisfied with all services provided by my port through its online channel.	0.758			
Customer Loyalty	11. I seldom consider switching to another Web site.	0.454	72.847	0.848	0.929
	12. If the present service continues, I doubt that I would switch Web sites.	0.698			
	13. I try to use the Web site whenever I need to make a purchase.	0.768			
	14. When I need to make a purchase, this Web site is my first choice.	0.855			
	15. I like using this Web site.	0.646			
	16. I intend to continue using the online port.	0.620			
	17. I prefer the online port above others.	0.831			
	18. I would recommend the port's website to others.	0.854			
	19. I would like to say positive things about online port to other people.	0.771			
	20. I would recommend online port to someone who seeks advice.	0.787			

Port Performance	21. Improve employee's problem-solving ability	0.744	82.501	0.769	0.965
	22. Improve employee's service quality	0.843			
	23. Improve employee's intention to learn	0.856			
	24. Effectively promote corporate culture	0.792			
	25. Increase market share	0.712			
	26. Increase operating efficiency	0.804			
	27. Improve the ability to retain old customers	0.899			
	28. Improve the ability to confirm target customers	0.804			
	29. Increase sales growth rate	0.867			
	30. Satisfy needs of various types of customers	0.859			
	31. Increase customer intention to purchase	0.905			
	32. Increase customer satisfaction	0.854			

Variables	Statement	Factor Loading	AVE	KMO	Cronbach's Alpha
	33. Reduce total cost of the hotel	0.785			
	34. Reduce unexpected losses	0.852			
	35. Increase return on assets	0.736			
	36. Increase net profit margin	0.887			

Conclusion

This chapter illustrates the methodology used in the research to study effect of E-CRM on Egyptian Port Performance through customer satisfaction and customer loyalty in MENA Ports. Positivism philosophy was used in solving research problems and identifying the relationship of the study, and the study also followed the deductive approach to collect data and prove the relationship between the study variables, so the research clarified the quantitative data used through a questionnaire directed at users of MENA Ports. Table 3-3 represents the summary of research methodology.

Table 3- 3: Summary of Research Methodology

Items	Type
Research Philosophy	Positivism Philosophy
Research Approach	Deductive Approach
Research Design	Quantitative Approach
Data Collection	Primary Data
Time Horizon	Cross-Sectional Data
Analysis Technique	Descriptive Analysis, Testing Regression Assumption and Structural Equation Modelling (SEM)

CHAPTER FOUR

EMPIRICAL STUDY AND FINDINGS

4.1 Introduction

This chapter presents the empirical study of the research variables. It also presents the main findings and findings after performing the data analysis. Data analysis is performed by applying several steps; The first is to test the data for validity and reliability. The second step is the descriptive analysis that is presented. Moreover, in order to verify the assumptions of the model, a normality test for the research variables was introduced. The fourth step is to test the research hypotheses using correlation analysis and regression. The analysis is implemented using SPSS (Statistical Package for Social Sciences). These packages are used for analyzing the data collected through the questionnaire designed for the purpose of the current research.

4.2 Validity and Reliability Tests

The table shows the results of the structural validity tests of the sample. Table 4-1, after excluding the items that have problems in the factor loading because its value is less than 0.4, indicates that the values of the factors loading are greater than 0.4. In addition, all mean values of the explained variance are greater than 50%. To test the stability, the researcher calculated the values of Cronbach's alpha coefficient to test the stability of the scales, and the internal consistency. The

table shows that Cronbach's alpha coefficients are greater than 0.7, all of which are acceptable values to test the stability of measurement for each of the study variables.

Table 4- 1: Validity and Reliability Test

Variable	KMO	% Of Variance	Cronbach's Alpha	Statement	Factor Loading
E-CRM	0.905	68.117%	0.921	E-CRM1	.717
				E-CRM2	.695
				E-CRM3	.673
				E-CRM4	.696
				E-CRM5	.684
				E-CRM6	.718
				E-CRM7	.586
Customer Satisfaction	0.864	85.136%	0.942	CS1	.832
				CS2	.851
				CS3	.864
				CS4	.858
Customer Loyalty	0.960	75.668%	0.964	CL1	.711
				CL2	.654
Port Performance	0.981	75.272%	0.979	CL3	.722
				CL4	.697
				CL5	.719
				CL6	.791
				CL7	.765
				CL8	.785
				CL9	.777
				CL10	.947
				PP1	.842
				PP2	.628
PP3	.823				
PP4	.748				
PP5	.720				
PP6	.765				
PP7	.745				
PP8	.802				
PP9	.821				
PP10	.798				
PP11	.804				
PP12	.800				
PP13	.819				
PP14	.761				
PP15	.696				
PP16	.596				
PP17	.628				

4.3 Descriptive Analysis for Research Variables

Similar to the respondents' profile, the researcher is able to present the frequencies of responses used for representing the research variables. Table 4-2 illustrates the descriptive analysis for the research variables using frequencies, where the value "1" refers to "Strongly Agree" response, the value "2" refers to "Agree" response, the value "3" refers to "Neutral" response, the value "4" refers to "Disagree" response, and the value "5" refers to "Strongly Disagree" response. The Mean and Standard Deviation for the research variables is represented in Table 4-2 as well.

Table 4- 2: Descriptive Analysis for Research Variables

Research Variables	N	Mean	Std. Deviation	Frequency				
				1	2	3	4	5
E-CRM	403	2.757	1.84	108	63	110	63	59
Customer Satisfaction	403	3.102	1.514	85	74	72	59	113
Customer Loyalty	403	3.737	1.413	52	33	57	88	173
Port Performance	403	2.735	1.436	118	96	77	80	59

4.4 Normality Testing for the Research Variables

It is one of the assumptions that has to be verified to determine if a data set is normal. If the data is normally distributed, the researcher could use parametric analysis such as Spearman Correlation. Therefore, it could be claimed that the normality of data should be verified as a preliminary step for inferential analysis, as it determines whether the researcher could use parametric or non-parametric tests to respond to the research hypotheses. One of the most common methods to check normality of a data set is the Kolmogorov-Smirnov test of normality, which tests the normality assumption for samples greater than 50 observations. It assumes that the data is normally distributed if the P-value is greater than 0.05. It is called the formal test of normality.

Formal Normality Testing for the Research Variables

In order to check the normality of the data, Table 4-3 shows the formal test for the assumption of normality using the Kolmogorov-Smirnov and Shapiro-Wilk test for the normality of the search variables. It can be seen that the search variables are not normally distributed, as the corresponding P values are all less than 0.05.

Table 4- 3: Formal Normality Testing for the Research Variables

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
E-CRM	.166	403	.000	.884	403	.000
Customer Satisfaction	.176	403	.000	.861	403	.000
Customer Loyalty	.244	403	.000	.802	403	.000
Port Performance	.179	403	.000	.872	403	.000

Informal Normality Testing for the Research Variables

Since the formal test shows that the data collected for the research variables are not normally distributed, an informal test is used to reveal the approximate normality, where the number of observations exceeds 150. Table 4-4 shows the unofficial test for normality, where it can be shown that some values of skewness and kurtosis are not with the acceptance level ± 1 , which means that the data under study are not normal.

Table 4- 4: Informal Normality Testing for the Research Variables

	Skewness		Kurtosis	
	Statistic	Std. Error	Statistic	Std. Error
E-CRM	.166	.122	-1.169	.243
Customer Satisfaction	-.052	.122	-1.447	.243
Customer Loyalty	-.809	.122	-.691	.243
Port Performance	.174	.122	-1.330	.243

4.5 Testing Regression Assumptions

This section investigates and verifies the regression assumptions for the above conducted models. The problems of multicollinearity, autocorrelation and heteroscedasticity are discussed below.

4.5.1 Testing Multicollinearity Assumption

This section investigates and verifies one of the important assumptions required to avoid redundancy of information in the model under study, which is the problems of multicollinearity. It occurs when two or more predictors in a model are highly correlated with each other. This leads to problems with understanding which predictors contribute to the variance explained in criterion, as well as technical issues in calculating a multiple regression model. Therefore, redundant information about the criterion is provided. By testing VIF values as shown in Table 4-5, it could be observed that all VIF values of the research variables under study are less than 5, implying that there is no problem of multicollinearity between the research variables under study.

Table 4- 5: Testing Multicollinearity

Research Variables	VIF
E-CRM	1.155
Customer Satisfaction	1.188
Customer Loyalty	1.168

4.5.2 Testing Autocorrelation Assumption

It refers to the degree of correlation between the values of same variables across different observation in data. In this research, there is one dependent variable that is financial inclusion. Therefore, we have three models for autocorrelation using Durbin-Watson in using OLS estimation in SPSS. In addition, if the value of Durbin-Watson is closer to two it means that there is no autocorrelation problem. According to Table 4-6, the researcher found that DurbinWatson is equal 1.875, which is closed to 2 so, there is no auto-correlation.

Table 4- 6: Testing Autocorrelation

Durbin-Watson	1.893
---------------	-------

4.5.3 Testing Heteroscedasticity Assumption

With respect to this, the scatter plot of the standardized residuals against the unstandardized predicted values is used to check this assumption visually. The results indicate that the relationships among variables are homoscedastic, as shown in Figure 4-1.

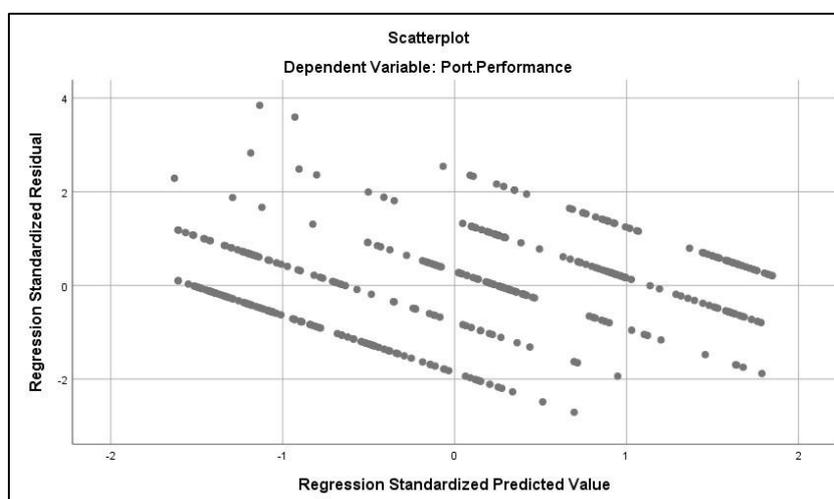


Figure 4 - 1: Testing Heteroscedasticity

4.6 Testing the Research Hypotheses

In this section, the researcher will test the research hypotheses under study, where it will analyze the correlation and regression between the variables.

4.6.1 Testing First Hypothesis

Table 4-7 shows that the researcher tested the correlation coefficient between E-CRM and port performance. It was found that there is a positive statistically significant correlation between E-CRM and port performance, as the correlation coefficient value are 0.755, and the level of significance is less than 0.05.

Table 4- 7: Correlation Analysis between E-CRM and Port Performance

		1.	2.
1. E-CRM	Spearman Correlation	1.000	
	Sig. (2-tailed)	.	
	N	403	
2. Port Performance	Spearman Correlation	.755**	1.000
	Sig. (2-tailed)	.000	.
	N	403	403

Table 4-8 shows the regression model fitted for the effect of E-CRM on port performance. It illustrates that there is a significant positive effect of E-CRM on port performance, as the regression coefficients are 0.787 and P-values are 0.000. Moreover, the R square is 0.575 which means 57.5% of the variation of port performance can be explained by E-CRM.

Table 4- 8: Regression Analysis of E-CRM on Port Performance

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	R ²
	B	Std. Error	Beta			
(Constant)	.565	.104		5.432	.000	.575
E-CRM	.787	.034	.759	23.313	.000	

a. Dependent Variable: Port Performance

Therefore, the regression equation could be written as follows:

$$Port\ Performance = 0.565 + 0.787 * E-CRM$$

Table 4-9 shows the SEM analysis for the impact of the E-CRM on port performance. It could be observed that there is a significant positive effect of E-CRM on port performance as the P-value is less than 0.05 (P-value = 0.000) with estimate equal to 0.816. Furthermore, the R square is 0.641, which means the model can explain 64.1% of the variation in port performance.

Table 4-9: SEM Analysis of E-CRM on Port Performance

		Estimate	P	R ²	
Port Performance	<---	E-CRM	.816	***	.641

The model fit indices; CMIN/DF = 2.953, GFI = 0.934, CFI = 0.973, AGFI= 0.903, and RMSEA = 0.070 are all within their acceptable levels. The SEM model conducted for the effect of the E-CRM on Port Performance is illustrated in Figure 4-2.

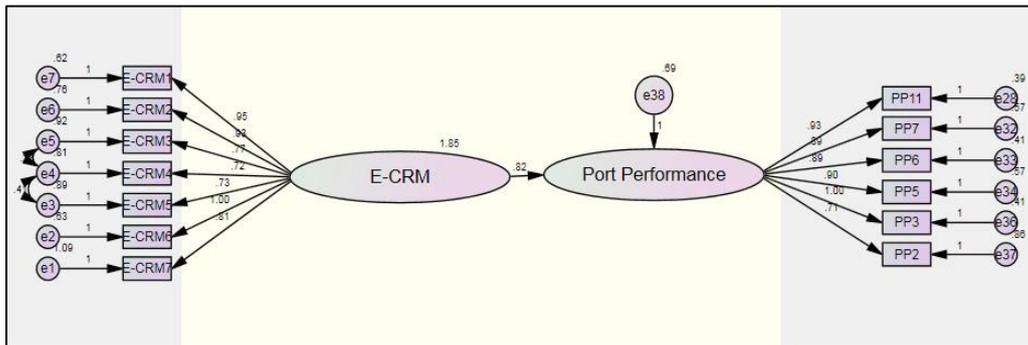


Figure 4- 2: SEM for the effect of E-CRM on Port Performance

4.6.2 Testing Second Hypothesis

Table 4-10 shows that the researcher tested the correlation coefficient between E-CRM and customer satisfaction. It was found that there is a positive statistically significant correlation between E-CRM and customer satisfaction, as the correlation coefficient value are 0.310, and the level of significance is less than 0.05.

Table 4- 10: Correlation Analysis between E-CRM and Customer Satisfaction

		1.	2.
1. E-CRM	Spearman Correlation	1.000	
	Sig. (2-tailed)		
	N	403	
2. Customer Satisfaction	Spearman Correlation	.310**	1.000
	Sig. (2-tailed)	.000	
	N	403	403

Table 4-11 shows the regression model fitted for the effect of E-CRM on customer satisfaction. It illustrates that there is a significant positive effect of E-CRM on customer satisfaction, as the regression coefficients are 0.340 and P-values are 0.000. Moreover, the R square is 0.097 which means 9.7% of the variation of customer satisfaction can be explained by E-CRM.

Table 4- 11: Regression Analysis of E-CRM on Customer Satisfaction

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	R ²
	B	Std. Error	Beta			
(Constant)	2.164	.160		13.521	.000	.097
E-CRM	.340	.052	.311	6.555	.000	

a. Dependent Variable: Customer Satisfaction

Therefore, the regression equation could be written as follows:

$$\text{Customer Satisfaction} = 2.164 + 0.340 * \text{E-CRM}$$

Table 4-12 shows the SEM analysis for the impact of the E-CRM on Customer Satisfaction. It could be observed that there is a significant positive effect of E-CRM on Customer Satisfaction as the P-value is less than 0.05 (P-value = 0.000) with estimate equal to 0.435. Furthermore, the R square is 0.198, which means the model can explain 19.8% of the variation in Customer Satisfaction.

Table 4-12: SEM Analysis of E-CRM on Customer Satisfaction

			Estimate	P	R ²
Customer Satisfaction	<---	E-CRM	.435	***	.198

The model fit indices; CMIN/DF = 3.784, GFI = 0.931, CFI = 0.968, AGFI= 0.888, and RMSEA = 0.083 are all within their acceptable levels. The SEM model conducted for the effect of the E-CRM on Customer Satisfaction is illustrated in Figure 4-3.

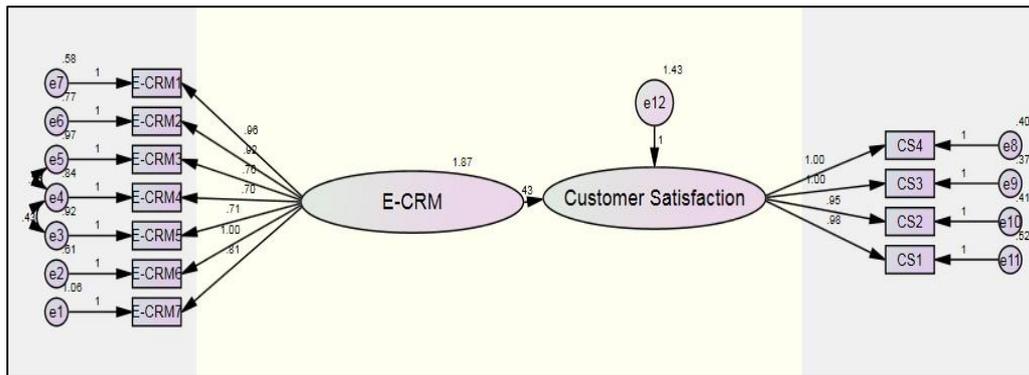


Figure 4- 3: SEM for the effect of E-CRM on Customer Satisfaction

4.6.3 Testing Third Hypothesis

Table 4-13 shows that the researcher tested the correlation coefficient between E-CRM and customer loyalty. It was found that there is a positive statistically significant correlation between E-CRM and customer loyalty, as the correlation coefficient value are 0.225, and the level of significance is less than 0.05.

Table 4- 13: Correlation Analysis between E-CRM and Customer Loyalty

		1.	2.
1. E-CRM	Spearman Correlation	1.000	
	Sig. (2-tailed)	.	
	N	403	
2. Customer Loyalty	Spearman Correlation	.225**	1.000
	Sig. (2-tailed)	.000	.
	N	403	403

Table 4-14 shows the regression model fitted for the effect of E-CRM on customer loyalty. It illustrates that there is a significant positive effect of E-CRM on customer loyalty, as the regression coefficients are 0.290 and P-values are 0.000. Moreover, the R square is 0.081 which means 8.1% of the variation of customer loyalty can be explained by E-CRM.

Table 4- 14: Regression Analysis of E-CRM on Customer Loyalty

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	R ²
	B	Std. Error	Beta			
(Constant)	2.938	.151		19.495	.000	.081
E-CRM	.290	.049	.284	5.931	.000	

a. Dependent Variable: Customer Loyalty

Therefore, the regression equation could be written as follows:

$$\text{Customer Loyalty} = 2.938 + 0.290 * \text{E-CRM}$$

Table 4-15 shows the SEM analysis for the impact of the E-CRM on Customer Loyalty. It could be observed that there is a significant positive effect of E-CRM on Customer Loyalty as the P-value is less than 0.05 (P-value = 0.000) with estimate equal to 0.355. Furthermore, the R square is 0.124, which means the model can explain 12.4% of the variation in Customer Loyalty.

Table 4-15: SEM Analysis of E-CRM on Customer Loyalty

			Estimate	P	R ²
Customer Loyalty	<---	E-CRM	.355	***	.124

The model fit indices; CMIN/DF = 3.682, GFI = 0.913, CFI = 0.962, AGFI= 0.876, and RMSEA = 0.082 are all within their acceptable levels. The SEM model conducted for the effect of the E-CRM on Customer Loyalty is illustrated in Figure 4-4.

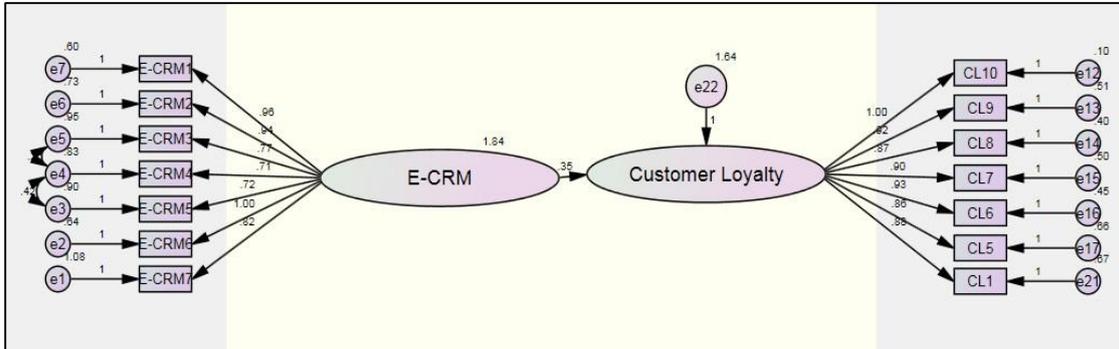


Figure 4- 4: SEM for the effect of E-CRM on Customer Loyalty

4.6.4 Testing Fourth Hypothesis

Table 4-16 shows that the researcher tested the correlation coefficient between customer satisfaction and customer loyalty. It was found that there is a positive statistically significant correlation between customer satisfaction and customer loyalty, as the correlation coefficient value are 0.280, and the level of significance is less than 0.05.

Table 4- 16: Correlation Analysis between Customer Satisfaction and Customer Loyalty

		1.	2.
1. Customer Satisfaction	Spearman Correlation	1.000	
	Sig. (2-tailed)	.	
	N	403	
2. Customer Loyalty	Spearman Correlation	.280**	1.000
	Sig. (2-tailed)	.000	.
	N	403	403

Table 4-17 shows the regression model fitted for the effect of customer satisfaction on customer loyalty. It illustrates that there is a significant positive effect of customer satisfaction on customer loyalty, as the regression coefficients are 0.305 and P-values are 0.000. Moreover, the R square is 0.107 which means 10.7% of the variation of customer loyalty can be explained by customer satisfaction.

Table 4- 17: Regression Analysis of Customer Satisfaction on Customer Loyalty

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	R ²
	B	Std. Error	Beta			
(Constant)	2.791	.152		18.364	.000	.107
Customer Satisfaction	.305	.044	.327	6.922	.000	

a. Dependent Variable: Customer Loyalty

Therefore, the regression equation could be written as follows:

$$Customer\ Loyalty = 2.791 + 0.305 * Customer\ Satisfaction$$

Table 4-18 shows the SEM analysis for the impact of the Customer Satisfaction on Customer Loyalty. It could be observed that there is a significant positive effect of Customer Satisfaction on Customer Loyalty as the P-value is less than 0.05 (P-value = 0.000) with estimate equal to 0.369. Furthermore, the R square is 0.130, which means the model can explain 13% of the variation in Customer Loyalty.

Table 4-18: SEM Analysis of Customer Satisfaction on Customer Loyalty

			Estimate	P	R ²
Customer Loyalty	<---	Customer Satisfaction	.369	***	.130

The model fit indices; CMIN/DF = 2.970, GFI = 0.942, CFI = 0.982, AGFI= 0.911, and RMSEA = 0.070 are all within their acceptable levels. The SEM model conducted for the effect of the Customer Satisfaction on Customer Loyalty is illustrated in Figure 4-5.

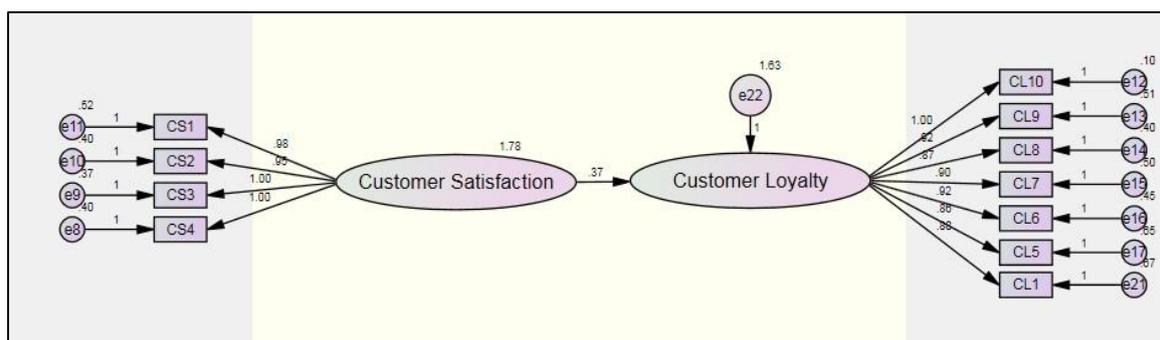


Figure 4- 5: SEM for the effect of Customer Satisfaction on Customer Loyalty

4.6.5 Testing Fifth Hypothesis

Table 4-19 shows that the researcher tested the correlation coefficient between customer satisfaction and port performance. It was found that there is a positive statistically significant correlation between customer satisfaction and port performance, as the correlation coefficient value are 0.300, and the level of significance is less than 0.05.

Table 4- 19: Correlation Analysis between Customer Satisfaction and Port Performance

		1.	2.
1. Customer Satisfaction	Spearman Correlation	1.000	
	Sig. (2-tailed)	.	
	N	403	
2. Port Performance	Spearman Correlation	.300**	1.000
	Sig. (2-tailed)	.000	.
	N	403	403

Table 4-20 shows the regression model fitted for the effect of customer satisfaction on port performance. It illustrates that there is a significant positive effect of E customer satisfaction on port performance, as the regression coefficients are 0.292 and P-values are 0.000. Moreover, the R square is 0.097 which means 9.7% of the variation of port performance can be explained by customer satisfaction.

Table 4- 20: Regression Analysis of Customer Satisfaction on Port Performance

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	R ²
	B	Std. Error	Beta			
(Constant)	1.829	.156		11.760	.000	.097
Customer Satisfaction	.292	.045	.308	6.479	.000	

a. Dependent Variable: Port Performance

Therefore, the regression equation could be written as follows:

$$\text{Port Performance} = 1.829 + 0.297 * \text{Customer Satisfaction}$$

Table 4-21 shows the SEM analysis for the impact of the Customer Satisfaction on Port Performance. It could be observed that there is a significant positive effect of Customer Satisfaction on Port Performance as the P-value is less than 0.05 (P-value = 0.000) with estimate equal to 0.373. Furthermore, the R square is 0.129, which means the model can explain 12.9% of the variation in Port Performance.

Table 4-21: SEM Analysis of Customer Satisfaction on Port Performance

		Estimate	P	R ²	
Port Performance	<---	Customer Satisfaction	.373	***	.129

The model fit indices; CMIN/DF = 3.242, GFI = 0.950, CFI = 0.979, AGFI= 0.919, and RMSEA = 0.075 are all within their acceptable levels. The SEM model conducted for the effect of the Customer Satisfaction on Port Performance is illustrated in Figure 4-6.

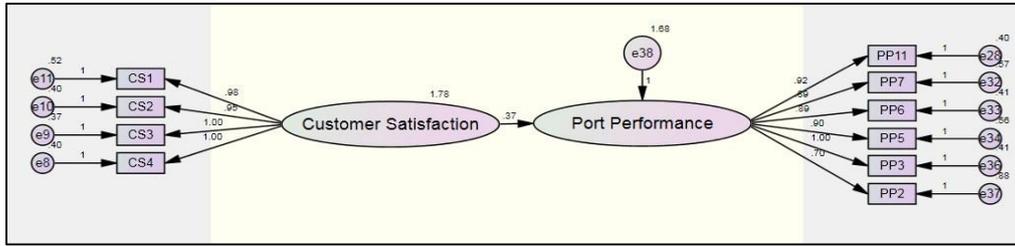


Figure 4- 6: SEM for the effect of Customer Satisfaction on Port Performance

4.6.6 Testing Sixth Hypothesis

Table 4-22 shows that the researcher tested the correlation coefficient between customer loyalty and port performance. It was found that there is a positive statistically significant correlation between customer loyalty and port performance, as the correlation coefficient value are 0.195, and the level of significance is less than 0.05.

Table 4- 22: Correlation Analysis between Customer Loyalty and Port Performance

		1.	2.
1. Customer Loyalty	Spearman Correlation	1.000	
	Sig. (2-tailed)	.	
	N	403	
2. Port Performance	Spearman Correlation	.195**	1.000
	Sig. (2-tailed)	.000	
	N	403	403

Table 4-23 shows the regression model fitted for the effect of customer loyalty on port performance. It illustrates that there is a significant positive effect of customer loyalty on port performance, as the regression coefficients are 0.257 and P-values are 0.000. Moreover, the R square is 0.064 which means 6.4% of the variation of port performance can be explained by customer loyalty.

Table 4- 23: Regression Analysis of Customer Loyalty on Port Performance

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	R ²
	B	Std. Error	Beta			
(Constant)	1.775	.196		9.051	.000	.064
Customer Loyalty	.257	.049	.253	5.226	.000	

a. Dependent Variable: Port Performance

Therefore, the regression equation could be written as follows:

$$\text{Port Performance} = 1.775 + 0.257 * \text{Customer Loyalty}$$

Table 4-24 shows the SEM analysis for the impact of the Customer Loyalty on Port Performance. It could be observed that there is a significant positive effect of Customer Loyalty on Port Performance as the P-value is less than 0.05 (P-value = 0.000) with estimate equal to 0.372. Furthermore, the R square is 0.133, which means the model can explain 13.3% of the variation in Port Performance.

Table 4-24: SEM Analysis of Customer Loyalty on Port Performance

		Estimate	P	R ²	
Port Performance	<---	Customer Loyalty	.372	***	.133

The model fit indices; CMIN/DF = 3.152, GFI = 0.926, CFI = 0.974, AGFI= 0.895, and RMSEA = 0.073 are all within their acceptable levels. The SEM model conducted for the effect of the Customer Loyalty on Port Performance is illustrated in Figure 4-7.

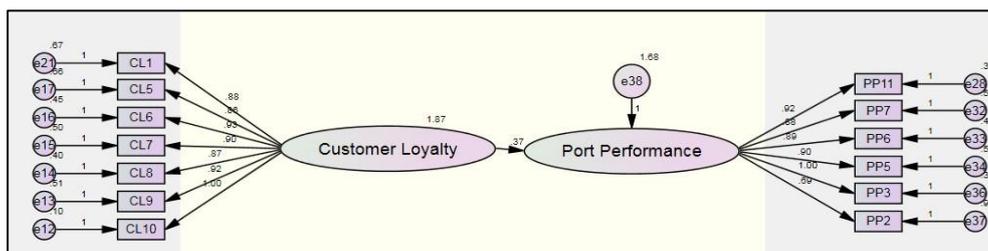


Figure 4- 7: SEM for the effect of Customer Loyalty on Port Performance

Conclusion

This chapter presented the empirical study to test the research hypotheses by measuring the research variables concluded from the literature review through a descriptive, correlation, and regression analysis using SPSS. Table 4-19 shows a summary for the conducted analysis and the resulting response for the research hypotheses.

Table 4- 25: Summary of Research Hypotheses

Description	Results
<i>H1: E-CRM has a Significantly Positive Impact on Port Performance</i>	Fully Supported
<i>H2: E-CRM has a Significantly Positive Impact on Customer Satisfaction</i>	Fully Supported
<i>H3: E-CRM has a Significantly Positive Impact on Customer Loyalty</i>	Fully Supported
<i>H4: There is a Significant Relationship between Customer Satisfaction and Customer Loyalty</i>	Fully Supported
Description	Results
<i>H5: Customer Satisfaction has a Significantly Positive Impact on Port Performance</i>	Fully Supported
<i>H6: Customer Loyalty has a Significantly Positive Impact on Port Performance</i>	Fully Supported

CHAPTER FIVE

DISCUSSION, CONCLUSION, AND RECOMMENDATIONS

5.1 Introduction

E-CRM application is created with customers as a frame of mind and gives customers a full experience on the web. Every different user has a view of information related with services and products available to them. Web-enabled CRM is usually created around one business unit or department and not for the whole company. In e-CRM on the other side, all applications are made for the entire company including all customers, supply providers and coworkers. E-CRM refers to simpler, more web-based electronic customer relationship management (Brennan et al., 2020).

Adoption of e-CRM has been a recent strategy in the majority of business organizations, more particularly the developing countries, and, as such, managers have strategically invested in on-line technologies while emphasizing the building and maintaining of worthy linkages with profitable customers (Harrigan et al., 2012; Nguyen and Mutum, 2012; Sigala, 2011; Thuo et al., 2011). Merging technology, processes and other business activities around the customer has facilitated CRM applications (Abdulfattah, 2012), enabling organizations to recognize the best customer, increase their satisfaction and loyalty.

A port's performance refers to its effectiveness in achieving its purpose, and in most cases, the purpose of its measurement is to improve the organization's financial result. Therefore, organizational performance is the process of achieving pre-determined organizational goals by increasing efficiency, quality, productivity and profitability from the perspective of the customer as well as the organizations. Based on the CRM discussions provided, CRM can be used to achieve these goals efficiently and effectively. Increased customer satisfaction, loyalty, and port performance after a CRM implementation can be used to measure the benefits of CRM as demonstrated by increasing the physical, financial, and quality performance of a port (Mkawuganga, 2018).

Statistical methods were used, such as: correlation, regression analysis, and both validity and reliability measures were used. The results were obtained and clarified in the previous chapter. The current chapter refers to a discussion of the main research findings, as well as the contribution and originality of the research. In addition, research implications, recommendations, and limitations are described in this chapter, respectively.

5.2 Research Discussion

In this chapter, the results of the analysis carried out in the previous chapter will be carried out in a manner that responds to the research objectives. The research objectives are the following:

- Discuss the extent of the effect E-CRM on customer satisfaction and customer loyalty.
- Studying the effect of customer satisfaction on their loyalty.
- Clarify the relationship between customer satisfaction and port performance.
- Explain the impact of customer loyalty and port performance.

Accordingly, this section discusses each one of the mentioned objectives, how it was achieved, to what extent it had been achieved, and the result of its achievement questionnaires collected from users of MENA Ports.

5.2.1 Testing the Relationship between E-CRM and Port Performance

The first objective had been achieved through discussing the literature reviews and through result of its achievement questionnaires collected, which investigated this objective. The first objective “**Examining the impact of E-CRM on port performance**”. From this objective, the first hypothesis of the research was reached, which states that “*H1: E-CRM has a Significantly Positive Impact on Port Performance*”. Accordingly, the researcher tested the correlation coefficient between E-CRM and port performance. It was found that there is a positive statistically significant correlation between E-CRM and port performance, as the correlation coefficient value are 0.755, and the level of significance is less than 0.05.

Moreover, the regression model fitted for the effect of E-CRM on port performance. It illustrates that there is a significant positive effect of E-CRM on port performance, as the regression coefficients are 0.787 and P-values are 0.000. Moreover, the R square is 0.575 which means 57.5% of the variation of port performance can be explained by E-CRM. Therefore, the first hypothesis, which states that “*H₁: E-CRM has a Significantly Positive Impact on Port Performance*” is fully supported.

Furthermore, the result of the research is consistent with all the previous literature (Abdullateef, 2010; Ahmad et al., 2012; Gujrati, 2016; AKYÜZ et al., 2017; Roopchund and Alsaïd, 2017; Joudeh and Dandis, 2018; Mang’unyi et al., 2018; Mkawuganga, 2018) as they all confirmed the same results as the current research.

5.2.2 Testing the Relationship between E-CRM and Customer Satisfaction

The second objective had been achieved through discussing the literature reviews and through result of its achievement questionnaires collected, which investigated this objective. The second objective “**Discuss the extent of the effect E-CRM on customer satisfaction**”. From this objective, the second hypothesis of the research was reached, which states that “*H₂: ECRM has a Significantly Positive Impact on Customer Satisfaction*”. Accordingly, the researcher tested the correlation coefficient between E-CRM and customer satisfaction. It was found that there is a positive statistically significant correlation between E-CRM and customer satisfaction, as the correlation coefficient value are 0.310, and the level of significance is less than 0.05.

Moreover, the regression model fitted for the effect of E-CRM on customer satisfaction. It illustrates that there is a significant positive effect of E-CRM on customer satisfaction, as the regression coefficients are 0.340 and P-values are 0.000. Moreover, the R square is 0.097 which means 9.7% of the variation of customer satisfaction can be explained by E-CRM. Therefore, the second hypothesis, which states that “*H₂: E-CRM has a Significantly Positive Impact on Customer satisfaction*” is fully supported.

Furthermore, the result of the research is consistent with all the previous literature (Liu et al., 2012; Dhingra and Dhingra, 2013; Janahi and Al Mubarak, 2017; Mang’unyi et al., 2018; Farooq et al., 2018; Afthanorhan et al., 2019; Nunkoo et al., 2020; Phan et al., 2020; Yulianto, 2021; Krishnan, 2021; Dartey et al., 2021) as they all confirmed the same results as the current research.

5.2.3 Testing the Relationship Between E-CRM and Customer Loyalty

The second objective had been achieved through discussing the literature reviews and through result of its achievement questionnaires collected, which investigated this objective. The second objective “**Discuss the extent of the effect E-CRM on customer loyalty**”. From this objective, the third hypothesis of the research was reached, which states that “*H₃: E-CRM has a Significantly Positive Impact on Customer Loyalty*”. Accordingly, the researcher tested the correlation coefficient between E-CRM and customer loyalty. It was found that there is a positive statistically significant correlation between E-CRM and customer loyalty, as the correlation coefficient value are 0.225, and the level of significance is less than 0.05.

Moreover, the regression model fitted for the effect of E-CRM on customer loyalty. It illustrates that there is a significant positive effect of E-CRM on customer loyalty, as the regression coefficients are 0.290 and P-values are 0.000. Moreover, the R square is 0.081 which means 8.1% of the variation of customer loyalty can be explained by E-CRM. Therefore, the third hypothesis, which states that “*H₃: E-CRM has a Significantly Positive Impact on Customer Loyalty*” is fully supported.

Furthermore, the result of the research is consistent with some of previous literature (Alim and Ozuem, 2014; Salehi et al., 2015; Ismail and Yunan, 2016; Chang and Thai, 2016; Mang’unyi et al., 2017; Gong and Yi, 2018; Shankar and Jebarajakirthy, 2019; Zia, 2020; Fida et al., 2020; Hussain, 2021) as they all confirmed the same results as the current research. While, the result of the research is inconsistent with some the previous literature (Abror et al., 2019) as it indicated that the relationship between the variables is insignificant.

5.2.4 Testing the Relationship between Customer Satisfaction and Customer Loyalty

The third objective had been achieved through discussing the literature reviews and through result of its achievement questionnaires collected, which investigated this objective. The third objective “**Studying the effect of customer satisfaction on their loyalty**”. From this objective, the fourth hypothesis of the research was reached, which states that “*H₄: There is a Significant Relationship between Customer Satisfaction and Customer Loyalty*”. Accordingly, the researcher tested the correlation coefficient between customer satisfaction and customer loyalty. It was found that there is a positive statistically significant correlation between customer satisfaction and customer loyalty, as the correlation coefficient value are 0.280, and the level of significance is less than 0.05.

Moreover, the regression model fitted for the effect of customer satisfaction on customer loyalty. It illustrates that there is a significant positive effect of customer satisfaction on customer loyalty, as the regression coefficients are 0.305 and P-values are 0.000. Moreover, the R square is 0.107 which means 10.7% of the variation of customer loyalty can be

explained by customer satisfaction. Therefore, the fourth hypothesis, which states that “*H4: There is a Significant Relationship between Customer Satisfaction and Customer Loyalty*” is fully supported.

Furthermore, the result of the research is consistent with some of previous literature (Mohsan et al., 2011; Saleem and Raja, 2014; Priporas et al., 2017; Biscaia et al., 2017; Rather and Sharma, 2017; Schirmer et al., 2018; Raza et al., 2020) as they all confirmed the same results as the current research. While, the result of the research is inconsistent with some the previous literature (Aisyah, 2018) as it indicated that the relationship between the variables is insignificant.

5.2.5 Testing the Relationship between Customer Satisfaction and Port Performance

The fourth objective had been achieved through discussing the literature reviews and through result of its achievement questionnaires collected, which investigated this objective. The fourth objective “**Clarify the relationship between customer satisfaction and port performance**”.

From this objective, the fifth hypothesis of the research was reached, which states that “*H5: Customer Satisfaction has a Significantly Positive Impact on Port Performance*”. Accordingly, the researcher tested the correlation coefficient between customer satisfaction and port performance. It was found that there is a positive statistically significant correlation between customer satisfaction and port performance, as the correlation coefficient value are 0.300, and the level of significance is less than 0.05.

Moreover, the regression model fitted for the effect of customer satisfaction on port performance. It illustrates that there is a significant positive effect of E customer satisfaction on port performance, as the regression coefficients are 0.292 and P-values are 0.000. Moreover, the R square is 0.097 which means 9.7% of the variation of port performance can be explained by customer satisfaction. Therefore, the fifth hypothesis, which states that “*H5: Customer Satisfaction has a Significantly Positive Impact on Port Performance*” is fully supported.

Furthermore, the result of the research is consistent with some of previous literature (Williams and Naumann, 2011; Sun and Kim, 2013; Kangogo et al., 2013; Suchánek et al., 2015; Otto et al., 2020) as they all confirmed the same results as the current research.

5.2.6 Testing the Relationship between Customer Loyalty and Port Performance

The fourth objective had been achieved through discussing the literature reviews and through result of its achievement questionnaires collected, which investigated this objective. The fifth objective “**Explain the impact of customer loyalty and port performance**”. From this objective, the sixth hypothesis of the research was reached, which states that “*H6: Customer Loyalty has a Significantly Positive Impact on Port Performance*”. Accordingly, the researcher tested the correlation coefficient between customer loyalty and port performance. It was found that there is a positive statistically significant correlation between customer loyalty and port performance, as the correlation coefficient value are 0.195, and the level of significance is less than 0.05.

Moreover, the regression model fitted for the effect of customer loyalty on port performance. It illustrates that there is a significant positive effect of customer loyalty on port performance, as the regression coefficients are 0.257 and P-values are 0.000. Moreover, the R square is 0.064 which means 6.4% of the variation of port performance can be explained by customer loyalty. Therefore, the sixth hypothesis, which states that “*H6: Customer Loyalty has a Significantly Positive Impact on Port Performance*” is fully supported.

Furthermore, the result of the research is consistent with some of previous literature (Boonmalert et al., 2020; Sampaio et al., 2020) as they all confirmed the same results as the current research. While, the result of the research is inconsistent with some the previous literature (Vilkaitė-Vaitonė and Papšienė, 2016; Rashid et al., 2020) as it indicated that the relationship between the variables is insignificant.

5.3 Research Contribution and Originality

The aim of the research is to study the effect of E-CRM on port performance through customer satisfaction and loyalty in the ports of the MENA region. Therefore, the research presented six hypotheses, first, to study the effect of E-CRM on the performance of ports. Second, research the impact of E-CRM on customer satisfaction. Third, clarify the impact of E-CRM on customer loyalty. Fourth, show the effect of customer satisfaction on their loyalty. Fifthly, the effect of customer satisfaction on port performance was studied. Finally, the effect of customer loyalty on port performance was studied. From the foregoing, the research contributed to the development of a new addition to academic research, as none of the previous literature dealt with the study of all these variables and their impact. The research also added a new contribution represented in the sample population, which was targeted with a questionnaire to achieve the objectives of the research.

5.4 Research Implications

Academic Implication: In this research, the researcher took into consideration the academic meaning, as the research discusses the impact of E-CRM on port performance through customer satisfaction and loyalty in the ports of the MENA region. So, the other researcher must develop his framework with other factors that can affect this relationship.

Practical Implication: The results of the study have many implications for decision-makers. Therefore, decision makers should focus on increasing the impact of E-CRM implication on port performance, and increase through customer satisfaction and loyalty as well, as customer satisfaction and loyalty help in improve the relationship between E-CRM and port performance.

5.5 Research Recommendation

The most important recommendations for top managers and decision makers in ports are as follows:

1. Working on effective electronic communication with customers on a permanent and continuous basis through:
 - Designing interactive websites on the Internet that allow customers to obtain information in an easy and fast way, express their opinions, and obtain their assessments of the level of services provided
 - Focus on communicating with customers via text messages on mobile phones or email, such as sending notifications of customer account movement, announcements about new services that customers can benefit from, or any other information of interest to the customer
 - Create chat rooms in which the customer can inquire about any information or banking service around the clock at very low costs.
 - Take advantage of the widespread social networking sites to provide useful banking information, and to announce the new services provided.
 - Providing some prizes, material gifts, thank you cards and greeting cards to customers, and taking care of their special occasions, and important days for them, by relying on the Internet.
2. Ensure that regular or important customers in their dealings with the ports truly feel this distinction and that they differ in treatment from non-regular customers, and maintain regular or permanent electronic communication with them.
3. Focusing on building technology-based relationships that enable access to a high level of personal communication, and make the customer feel distinguished as if the message had been sent specifically for him.
4. Supporting and strengthening the customer's confidence through constant communication with him, informing him of all the information that interests him, so that this communication takes place in an ordinary traditional way or in an electronic way that relies on modern means and technologies, and informs him that he is dealing with a service ready to listen and serve him around the clock and at any time A place was, and it is trusted, whatever the method of communication between the service provider and its customers.
5. Be careful to avoid mistakes in electronic communication with customers, which enhances their confidence in this type of communication, and encourages them to use and benefit from it.
6. Being keen on fulfilling all the promises made by the service manager to its customers, dealing with them with high transparency, working to resolve all disputes in a way that is always satisfactory to them, and paying attention to their opinions in a way that enhances their confidence and increases their commitment, bonding and loyalty.
7. Carrying out extensive research that examines the impact of electronic communication methods on some behavioural and cognitive aspects of customers, in addition to researching more deeply the electronic relationship between service providers and their customers so that it includes more of its dimensions, tools, advantages and discovery of its negatives, and a situation in a well-studied scientific framework.

5.6 Research Limitations

This research has many limitations through the study that I dealt with. First, despite the fact that the researcher collected data from MENA ports, the research was limited to considering more other sectors. In addition, the second limitation of this research is the time limit to finish the research, which was an obstacle to collecting a larger sample size to represent the data under study. The third limitation was the small number of sample size used in the questionnaires collected, which prompted them to adopt a comprehensive enumeration method.

Therefore, the research presented some recommendations for future researchers in the same field of study, which are as follows:

- Research and adding new variables that affect the search variables.
- Future research on this phenomenon should involve different countries and different sectors.
- Conducting a comparative study between a developed and developing country.
- A longitudinal study is recommended for better results, as time was one of the obstacles in this study.
- Future researchers should have a better time frame to be able to collect a larger sample as well as follow the random sampling technique.

5.7 Research Conclusion

Finally, it was concluded that the methods of communication and building electronic relationships with customers are a positive and effective method if they are used in certain circumstances. Tangible material returns such as gifts, discounts and additional services play a positive role in reducing customers' anxiety cases, increasing their confidence and commitment towards their relationship with the ports they deal with, and encouraging them to request more services. The distinguished treatment that regular customers receive increases their confidence in their relationship with the ports and their sense of distinction, that they will receive services that suit their personal needs every time they request, and thus enhance their commitment to this relationship and work towards maintaining and supporting it constantly. Personal contacts play a positive role in raising the level of interaction between ports and their customers, and in the ease of obtaining the information that customers need, and expressing their opinion on the level of services provided, which

makes them in constant contact with the ports, which increases their feeling of comfort and reassurance, and enhances their confidence in the current ports and their obligation to deal with it. The direct e-mail between ports and clients and the e-mails he sends to them keeps clients informed and directly informed of all the information they need, in an easy and convenient way for them, and beyond the time and spatial limits of this communication, which makes clients feel comfortable and safe that the ports will inform them of everything that matters and provide them with information needed in a timely manner, thus enhancing customers' confidence in existing ports and their commitment to deal with them.

Moreover, there is a positive relationship between E-CRM implication and port performance. Also, there is a positive relationship between E-CRM implication and customer satisfaction as well as customer loyalty. In addition, the relationship between customer satisfaction and customer loyalty is positive and statistically significant. Therefore, both customer satisfaction and customer loyalty have a positive impact on port performance as well.

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