THE INFLUENCE OF INFORMATION AND
COMMUNICATION TECHNOLOGY ON COMPETITIVE
ADVANTAGE OF FIVE-STAR HOTELS IN NAIROBI
COUNTY

BY

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A Research Project Report Submitted to the School of Business in Partial Fulfillment of the Requirement for the Degree of Masters in Business Administration (MBA)

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STUDENT’S DECLARATION

I, the undersigned, declare that this is my original work and has not been submitted to any other college, institution or university other than the United States International University in Nairobi for academic credit.

Signed: __________________________  Date: __________________________

Emmaculate Wanjiku Thuo (ID 651152)

This project has been presented for examination with my approval as the appointed supervisor.

Signed: __________________________  Date: __________________________

Mr. Fred Newa

Signed: __________________________  Date: __________________________

Dean, School of Business
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ABSTRACT

The purpose of the study was to investigate the influence of information and communication technology on competitive advantage of five-star hotels in Nairobi County. The research objectives included: to determine the influence of IT infrastructure on the competitive advantage of five star hotels in Kenya; to determine the influence of IT competencies on the competitive advantage of five star hotels in Kenya; and to determine the influence of IT integration on the competitive advantage of five star hotels in Kenya.

A descriptive research design was adopted in the study. The population of the study included 127 managers from 10 five-star hotels in Nairobi County. This study utilized a stratified random sampling to select respondents. The sample size for this study was 60 managers from the 10 five star hotels in Nairobi County, and included 6 Managers (General Manager, Operations Manager, Sales and Marketing Manager, Finance Manager, Human Resource Manager, and Information Technology Manager) from each hotel. Primary data was sourced from the questionnaires by the respondents. The closed-ended questionnaires used a 5-point Likert scale to score responses. The data collection instrument was subjected to a pre-test, validity and reliability tests, before the actual data collection. All completed questionnaires were coded and entered into an Excel sheet for cleaning, and then imported into IBM SPSS statistical software for analysis. The responses were analyzed for descriptive and inferential statistics.

The descriptive statistics show that, with regard to IT infrastructure, there was a very high level of adoption and use of IT hardware and software relating to the hospitality industry. There was high level of agreement among managers that information communication and technology applications were being used to perform core hotel functions. IT formed the backbone for booking, front office operations, customer relationship management, restaurant management, financial management, business intelligence and analytics, warehouse and inventory management, and housekeeping. On IT competencies, the findings showed that the managers had soft skills in basic computer operations such as Microsoft Office and Email, had the ability to identify, diagnose and correct technological problems, used IT to build relationships with stakeholders, process data and results for strategic decision-making, and were aware of security issues associated with using distributed IT systems. The managers routinely used IT for communication, negotiation and collaboration with workplace teams; were aware of significant trends in technological
innovation that could affect the hotel industry; and understood the legal, ethical, cultural and societal issues related to the adoption and use of ICT. On IT integration, nearly all the managers indicated that all the managerial personnel possess IT management capabilities necessary for maximum exploitation of IT resources and that the hotels had installed electronic human resource management applications to manage human capital. IT systems in the hotels linked all functional departments and external stakeholders such as suppliers. The managers were convinced that their hotels had the best IT system, which connected all branches. IT integration allowed the hotel to provide a wide variety of information to end users and share information seamlessly across the organization. Multiple regression results showed that there was a negative and significant relationship between IT infrastructure and competitive advantage. The regression results show a positive and significant relationship between IT competencies and competitive advantage, and a positive and significant relationship between IT integration and competitive advantage.

The study recommends continued update of IT infrastructure to match the competition. The hotels should invest in improving IT competency through training programs so as to align IT investments with internal capabilities and organizational processes. Finally, hotels should integrate a well-organized IT integration strategy into its strategic decision processes to continually guide the seamless interaction between managerial, human resource, financial, and customer service components for continued creation and generation of competitive advantage, and by extension, financial performance.
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# TABLE OF CONTENTS

STUDENT'S DECLARATION ................................................................. ii
COPYRIGHT ....................................................................................... iii
ABSTRACT ........................................................................................ iv
ACKNOWLEDGMENT ......................................................................... vi
LIST OF TABLES ............................................................................... x
LIST OF FIGURES ............................................................................. xi
ABBREVIATIONS ............................................................................... xii

CHAPTER ONE ...................................................................................... 1
1.0. INTRODUCTION ........................................................................... 1
  1.1. Background of Problem .............................................................. 1
  1.2. Statement of the Problem ............................................................ 4
  1.3. General Objective ..................................................................... 5
  1.4. Specific Objectives ................................................................... 5
  1.5. Significance of the Study ............................................................. 5
  1.6. Scope of the Study ................................................................... 6
  1.7. Definition of Terms .................................................................. 7
  1.8. Chapter Summary .................................................................... 8

CHAPTER TWO .................................................................................... 9
2.0. LITERATURE REVIEW ................................................................. 9
  2.1. Introduction ............................................................................... 9
  2.2. The Influence of IT Infrastructure on Competitive Advantage .......... 9
  2.3. The Influence of IT Competencies on Competitive Advantage .......... 14
  2.4. The Influence of IT Integration on Competitive Advantage .......... 19
  2.5. Chapter Summary ................................................................... 24
LIST OF TABLES

Table 3.1: Population ................................................................. 26
Table 3.2: Sample Size ................................................................. 27
Table 4.1: IT Infrastructure ......................................................... 36
Table 4.2: IT Competencies ......................................................... 37
Table 4.3: IT Integration .............................................................. 38
Table 4.4: Pearson Correlations .................................................. 39
Table 4.5: Model Summary .......................................................... 40
Table 4.6: ANOVA ................................................................. 40
Table 4.7: Regression Coefficients .............................................. 41
LIST OF FIGURES

Figure 4.1: Gender ........................................................................................................ 31
Figure 4.2: Age ............................................................................................................... 32
Figure 4.3: Duration Worked At Hotel ......................................................................... 32
Figure 4.4: Level of Education ..................................................................................... 33
Figure 4.5: Number of beds/rooms ............................................................................. 33
Figure 4.6: Years of Hotel Operations ......................................................................... 34
Figure 4.7: Years of Operation as a 5 Star Hotel ......................................................... 34
Figure 4.8: Number of Employees ............................................................................. 35
ABBREVIATIONS

ABC: Activity-Based Costing
ACM: Computing Machinery Committee
ANOVA: Analysis of Variance
CIO: Chief Information Officer
CRO: Central Reservation Office
CRS: Central Reservations System
CTO: Chief Technology Officer
EC: Electronic Commerce
ECRM: Electronic Customer Relationship Management
GDS: Global Distribution Systems
HRM: Human Resource Management
ICT: Information and Communications Technology
IT: Information Technology
KNBS: Kenya National Bureau of Statistics
OMS: Operational Management System
QMP: Quality Management Practices
RAISA: Robots, artificial intelligence and service automation
SMES: Small and Medium sized Enterprises
CHAPTER ONE

1.0. INTRODUCTION

1.1 Background of Problem

Companies are increasingly operating in challenging markets and facing an unpredictable, complex and competitive environment. Gaining and maintaining competitive advantage is crucial for the growth and survival of companies, and companies have to become agile and adaptable to market needs and competitor strategies. As the world economy moves towards greater integration, opportunities for actors in the tourism and hospitality industry lie in their ability to participate in the global marketplace while sustainably increasing the competitiveness (Yego, 2015).

Competitive advantage refers to the ability to create products and services that customers value more highly than similar offerings from competitors. Competitive advantage gives companies temporary advantage as competitors seek ways of duplicating the company’s market offering. For a company to gain and maintain competitive advantage it must continually defeat Porter’s five competitive forces, notably: rivalry of competitors within the industry, threat of new entrants into an industry and the market, threats posed to market share by substitute products, bargaining power of customers, and the bargaining power of suppliers (Xu & Quaddus, 2013).

In a dynamic and globalizing tourism and hospitality industry, companies must identify the key resources needed to generate competitive advantage. Information and communication technology (ICT) has been identified as a new organizational resource that can be exploited to create competitive advantage, and improve financial performance and competitiveness (Mihalic & Buhalis, 2013). ICT is indispensable to the tourism and hospitality industry. Tourism is an information-intensive industry and all tourism-oriented companies, including hotels and restaurants, tour operators, travel agencies, rental agencies, and cruisers depend on ICT to create, store, retrieve, and transfer information that is central to the functioning of the value chain and supply chain. In the hotel and hospitality industry, ICT is an integrated system of software and networked equipment facilitating data processing, information sharing, communication, and searching and selecting from a range of products. ICT offers a wide spectrum of solutions influencing increased efficiency level of business process (Januszewska, Nawrocka, & Jeremen,
The adoption of ICT can lead to dramatic changes in many functionalities of existing businesses, including the creation of new business models, business opportunities, and new methods of business processing; thereby creating alternatively methods for communication in sales, marketing and customer support (Gilaninia, Balaei, & Niyari, 2013).

With the proliferation of the internet, customers are continually searching for the best and cheap products. For a firm to remain competitive, they also have to continually upgrade the quality of their products and adopt the cheapest and most efficient methods of production. The motivation of firms to adopt and utilize information technologies as a means of gaining competitive advantage is driven by the need to achieve low cost delivery of products and services, deliver differentiated products, focus on specific market segments, and improve innovation in the organization (Righa, 2014).

Even though ICT can improve firm effectiveness and efficiency, analyses from the perspective of the resource-based view have showed that the potential of developing sustainable competitive advantage is doubtful due to the tradability of ICT hardware and software in the market. As a result, developing infrastructure that is complex, hard to imitate, and can generate sustainable competitive advantage must take into consideration other resources and capabilities in the organization. It is for this reason that human capital also considered an important when seeking sustainable competitive advantage. Additionally, while adoption of ICT can make strategic impact, integration between ICT and human capital enables the generation of information technology capability and effective utilization. This integration demands that human resource possesses sufficient information technology competence (Org & Ismail, 2008).

IT infrastructure refers to the different types of software, hardware, and other shared technological services for generating and managing information. It also includes business applications that are used to improve the company’s ability to respond to new opportunities in the market and neutralize competitive threats. IT competence represent the technical knowledge resident in employees who possess IT technical knowledge (Pérez-Árostegui, Bustinza-Sánchez, & Barrales-Molina, 2013). On the other hand IT integration refers to how IT is deployed to complement other organizational resources. ICT does not automatically merge with human and other organizational resources and must be integrated to generate the complex, firm-specific and intangible capabilities.
associated with creating and maintaining competitive advantage (Morabito, 2010). This study will therefore focus on the relationship between IT infrastructure, IT competence, and IT integration on competitive advantage in the hospitality industry.

Tourism is a major source of foreign exchange, job and wealth creation in Kenya. The hotel sector is the biggest player in the tourism industry. The country has a vibrant hospitality sector driven by demand in four main components: accommodation, foods and beverages, meetings and conferencing spaces, and leisure and entertainment (Nafula, 2015). According to the Kenya Economic Survey Report (2017) earnings from the tourism sector increased from Ksh 84.6 billion in 2015 to Ksh 99.7 billion in 2017, while the number of international arrivals increased by 13.5% in 2016. However, this was below what had been reported in earlier years, and was hence a recovery trend associated with aggressive marketing in the domestic and international markets (KNBS, 2018). The demand from local and international visitors has seen global and local investors jostle for a market share of the industry. Over the past 8 years, there has been a decline in accommodation and food services as a contribution to GDP from 1.6% in 2011 to 1.15% in 2017, international visitor arrivals from 1,823,000 in 2011 to 1,423,000 in 2017, bed-night occupancy rate from 40.3% in 2011 to 28.8% in 2017. In the same vein, international arrivals for holiday has also decreased from 72.4% in 2011 to 72.0% in 2017. The Nairobi hotel sector recorded a decline in 2017 with the Average Daily Rate (ADR) decreasing by 6.9% and room occupancy declining to 49% (Cytonn Real Estate, 2017).

According to the Restaurant and Hotel Act Cap 494, which regulates the licensing of Kenyan hotels and restaurants, a hotel is defined as a premise on which accommodation is supplied or is available for supply with or without food services in exchange for money. Hotels are classified as per the Act using star ratings, which ranges from one to five stars. These star ratings are used to classify hotels based on the standards upheld and amenities provided. The highest ranking, five star hotels, are those that offer the highest level of accommodations and services, provide a high degree of personal service, and are characterized by luxurious furnishing and exquisite menus, in addition to other amenities such as 24 hour room service, fitness centers, and concierge to assist clients (Nafula, 2015). A much clearer definition of a five star hotel is a hotel where the whole building is completely detached from other buildings with separate entry for goods and service; the minimum size of public rooms is not less than 2 square meters per guest room; have at
least one large room not less than 75 square meters and at least two smaller ones that are both carpeted, well-lit and maintained by the reception with high quality audio-visual and internet facilities; have a minimum of two restaurants offering different cuisines and services including a rich a la carte menu; minimum size of hotel room should be 25 square meters; and all rooms should have balconies (Cytonn Real Estate, 2017).

According to the Tourism Regulatory Authority (2018), there are 10 five star hotels in Nairobi: Villa Rosa Kempinski, Hemingway’s Nairobi, Sankara Nairobi, Fairmont The Norfolk, Tribe Hotel, The Sarova Stanley, Radisson Blue Hotel Nairobi, Dusit D2, Intercontinental Nairobi, and The Boma Nairobi (Tourism Regulatory Authority, 2018).

Cytonn Real Estate Report noted that the high-end hotel market in Nairobi is dominated with international brands, including Carlson Rezidor which operates Radisson Blue and Heron Portico, and Kempinski which operates Villa Rosa Kempinski (Cytonn Real Estate, 2017). Further, in 2017, four-star hotels were the best performing with an average occupancy of 56.6% compared to five-star hotels with 46% and three star hotels with a 49.4% occupancy rate (Cytonn Real Estate, 2017).

1.2 Statement of the Problem

ICT has become a necessity to compete in most industries, but a simple adoption and implementation of ICT is not enough to achieve competitive advantage and financial performance (Pérez-Aróstegui, Bustinza-Sánchez, & Barrales-Molina, 2013), since every competitor can acquire ICT hardware and software from the market. This implies than an organization must also possess other resources in order to generate IT competence and create valuable, non-imitable, and non-substitutable goods and services, which is the source of competitive advantage. However, despite increased adoption and use of ICT by hotels in Kenya, economic analysis shows that there has been a decline in industry performance, over the past 8 years (KNBS, 2018). Market analysis shows that the bed-night occupancy rate decreased from 40.3% in 2011 to 28.8% in 2017. In Nairobi, the Average Daily Rate (ADR) decreasing by 6.9% and room occupancy declining to 49%. Further, in 2017, four-star hotels outperformed with an average occupancy of 56.6% outperformed five-star hotels with 46% occupancy rate (Cytonn Real Estate, 2017).

Various studies have been done in Kenya on the link between information technology and competitive advantage, focusing on competitive strategies adopted by the Tribe Hotel in
Nairobi (Mutheu, 2014) and in Thika Town (Ngandu, 2014), determinants ICT adoption (Obonyo, Kambona, & Okeyo, 2016), information technology and competitive advantage (Righa, 2014), and IT integration and firm performance (Mwithiga, Information Technology (IT) Intergration and Firm Performance, 2017), among others. None of the studies have examined the IT dimensions in this study or covered all the five-star hotels in Nairobi to establish the extent to which IT and IT-related indicators influence competitive advantage.

In the face of increased entry of international brands which fuel stiff competition in the domestic industry, it is important to understand how the various dimensions of ICT influence the generation and maintenance of competitive advantage.

1.3 General Objective
To investigate the effect of information and communication technology on competitive advantage of five-star hotels in Nairobi County.

1.4 Specific Objectives

1.4.1 To determine the influence of IT infrastructure on the competitive advantage of five star hotels in Kenya

1.4.2 To determine the influence of IT competencies on the competitive advantage of five star hotels in Kenya

1.4.3 To determine the influence of IT integration on the competitive advantage of five star hotels in Kenya

1.5 Significance of the Study

1.5.1 Five Star Hotels
The 10 hotels classified as 5-star and included in this study are the principal beneficiaries of this research. The findings of the study are beneficial for improving the utilization and responsiveness of technology in improving operational efficiency, enhancing performance, and maintaining competitiveness.
1.5.2 Government

The government is responsible for creating a conducive business environment that enhances the productivity of enterprises in the tourism and hospitality industry. The results on the interrelationships between IT dimensions and competitive advantage provide important insight into how policies can improve the external environment in which hotels operate.

1.5.3 Researchers, Academicians, and Students

Information technologies are the primary drivers of the ongoing transitions in the economic and business environment. Information technologies continue to alter how businesses function, create new business models, and create new business opportunities and methods of production. In essence, the influence of IT on business processes and performance will remain a central focus over the decade. As a result, findings will not only bridge the gap in existing literature but also offer new avenues for further research.

1.5.4 IT Professionals

The hotel industry is a consumer not only of IT products but also consistently demands the services of IT professionals. This study examined the influences of IT infrastructure, competencies, and integration. It details the specific IT competencies demanded by 5-star hotels. As a result, it is beneficial to IT professionals with interest in working in the hotel and hospitality sector.

1.6 Scope of the Study

The study is limited to the hotel industry, with particular focus on five star hotels in Nairobi County. The study will also be limited to investigating the influence of IT dimensions on competitive advantage. The specific IT dimensions selected for this study are IT infrastructure, IT competence, and IT integration. The hotels selected for the study will be the 10 hotels classified as five star by the Tourism Regulatory Authority (2018). The research will be carried out between May and June 2018.
1.7 Definition of Terms

1.7.1 Information Technology

Information technology is a series of different implements including hardware, software, information theories, information networks, workstations and artificial intelligence (robotics) which use different forms of information as a systematic process to carry out activities (Kim, Shin, Kim, & Lee, 2011).

1.7.2 Competitive Advantage

Competitive advantage is anything that a firm does especially well compared to rival firms i.e. when a firm can do something that rival firms cannot do, or own something that rival firms desire while strategic management is all about gaining and maintaining competitive advantage (David, 2009).

1.7.3 IT Infrastructure

These encompass the different types of software, hardware, and other shared technological services for generating and managing information. It also includes business applications that are used to improve the company’s ability to respond to new opportunities in the market and neutralize competitive threats (Pérez-Aróstegui, Bustinza-Sánchez, & Barrales-Molina, 2013).

1.7.4 IT Competencies

This refers to the technical knowledge resident in employees who possess IT technical knowledge (Pérez-Aróstegui, Bustinza-Sánchez, & Barrales-Molina, 2013).

1.7.5 IT Integration

IT integration includes the advancement and reconfiguration of information technology to bolster business systems. IT integration is the use of IT tools in business operations so as to bring a positive impact on performance. IT adaptability is an essential part of IT integration, or how IT integrates with other physical, human, and organizational functionalities in your organization (Kim, Shin, Kim, & Lee, 2011).
1.8 Chapter Summary

This introductory chapter presents the background of the study and discusses the relationship between information technology and competitive advantage. It presents the statement of the problem, purpose and objective of the study, significance of the study and the scope. The succeeding Chapter will present an analysis of the literature review, present the theoretical framework, empirical review, and conceptual framework for the study. Chapter three will cover research methodology in terms of the research design, population and sampling design, data collection methods and analysis. Chapter four presents the results and the interpretation of findings. Chapter five covers the summary of the study, discussion of the research objectives, conclusions and recommendations.
CHAPTER TWO

2.0. LITERATURE REVIEW

2.1. Introduction

This section will offer a critique of empirical research on the influence of IT infrastructure, IT competencies, and IT integration on competitive advantage in the hotel industry.

2.2. The Influence of IT Infrastructure on Competitive Advantage

2.2.1. Competitive Advantage

Competitiveness is measured by the ability of the organization to stay in business and to protect the organization's investments, to earn a return on those investments, and to ensure jobs for the future. The theory of competitive advantage was developed by Michael Porter in 1979 and captures competitive responses in a dynamic organization’s business environment. According to the theory, competitive pressures are generated by the business environment in which a firm is operating since industry structures exert an influence on the rules of the game which reflect the kind of strategies firms adopt to survive and grow. The Porters five forces model incorporates: the entry barriers, rivalry among firms bargaining power of buyers, bargaining power of suppliers, threats of substitution, and industry participants. All these elements influence the level of profitability margins in different market segments (Porter, 1980). The basic competitive dimensions are cost, quality, time, and flexibility. Finally, profitability is also a measure of competitive advantage.

Costs may include direct (production) costs, productivity, capacity utilization, and inventory reduction (Bulankulama & Khatibi, 2014). Quality encompasses production processes and marketing functions. The dimensions of quality can be summarized by an eight-dimensional framework: performance, features, reliability, conformance, durability, serviceability, aesthetics, and perceived quality (Parajogo, 2007). In traditional observance of quality control emphasis is placed on the conformance dimension of quality (Lee & Zhou, 2007). Delivery is a competitive priority where the customers are interested in satisfying their needs and wants in the right quantity at the right time. Delivery time is concerned with the ability to deliver according to the promised schedule (Kumar & Kumar, 2014). Flexibility focuses on product mix, volume, changeover, and
Flexibility is therefore concerned with how a firm can deploy and/or re-deploy resources in response to changes in contractual agreements that are primarily initiated by customers (Wadhwa, 2014). Flexibility can be classified into action flexibility (the capacity to take new action to meet new circumstances) and state flexibility (the capacity to take new action to meet new circumstances). It can also be classified into job flexibility (the ability of the system to cope with changes in jobs to be processed in the system) and machine flexibility (the ability of the system to cope with changes and disturbances at the machine and work stations) (Schmenner & Takikonda, 2005).

Profitability is also used as a measure of a company’s ability to compete in the environment (Bulankulama & Khatibi, 2014). Financial indicators are indispensable while assessing business performance, they inform the business manager about the company capability of creating value and whether their employed measures did actually contribute towards creating this value (Zizlavsky, 2014). The return on assets (ROA) is a measure of earnings attributable to each financial unit of currency owned by a company during a given period. This ratio is used to measure how effectively an organization uses its resources to return value to its shareholders. The calculation is done by dividing the net income of the company against its total assets. The higher the ratio of the return on assets (ROA) the better it is for a company, it means that the company is using its assets effectively and efficiently (Anuonye, 2016).

### 2.2.2. IT Physical Infrastructure (Hardware)

According to Gheysari, Rasli, Roghani, and Jebur (2012) an infrastructure can be understood as a fundamental basis for an organization or a system; or basic facilities, services and installations that enable an entity to function. Infrastructure refers to that base upon which something else runs or operates, implying that the absense of a structure makes operations impossible. There are various elements of IT infrastructure, including the technological tools and the means of managing and exchanging knowledge such as computers, software and telecommunications; or any other systems that facilitate the processing, input, storage and transfer of information. IT infrastructure can be physical, intellectual, or procedural assets. As physical assets, they are fundamental technical structures shared across organizational units. As intellectual, they are IT related knowledge, expertise and management within the organization. As procedural, they are regulations that govern the evaluation, acquisition, building, implementation, use,
improvement and replacement of other IT resources. An example of procedural assets are IT standards that specify system design and development. By linking and sustaining IT applications to business processes and IT components, IT infrastructure achieves IT functionality and value (Gheysari, Rasli, Roghanian, & Jebur, 2012).

Cobanoglu, Berezina, Kasavana and Erdem (2011) reported that technology is a critical determinant for hotel guest satisfaction and for hotel selection. Technology can enhance guest experience and is a substantial factor impacting guest satisfaction. This study found three significant variables: in-room technologies (Voice over Internet Protocol (VoIP) telephone services, Pay-Per-View (PPV) movies, voicemail, game systems and universal battery charges), business essentials (business center services, express check-in/check-out, in-room telephone, alarm clock, and easily accessible electronic outlets) and Internet access. However the variable comfort technologies (in-room electronic safe, guest control panel, in-room PC, mobile access to hotel website, electronic lock, and flat screen HDTV) is the only category that has no impact on hotel guest satisfaction. Hotel companies tend to have more available resources for monitoring the guest experience because of the clear emphasis on experience and satisfaction customers have when selecting a hotel (Cobanoglu, Berezina, Kasavana, & Erdem, 2011).

According to Etinger and Cingula (2015) cloud computing is the latest strategic inflection point in the development of IT infrastructures. It is a model that allows for convenient network access to shared computing resources (networks, servers, storage data, applications, and services). The researchers noted that sophisticated portfolio of IT applications and high quality IT have grown to become important drivers of hotel performance and generation of competitive advantage. The study explored the impact of organizational and business benefits associated with cloud computing on the hotels’ internal and external competitive abilities. The results indicate a significant association between cloud computing adoption and improvement of the hotels’ ability to generate and sustain competitive advantage (Etinger & Cingula, 2015).

Chakravarty (2015) notes that over 70% of companies recognize the importance of IT infrastructure in enabling competitive advantage and optimizing profitability. Despite this recognition, only 22% of companies have well-defined IT infrastructure strategy, that is according to the IBM Institute for Business Value report, Continuing the IT Infrastructure Conversation: Why Building a Strong Foundation Requires More Than Technology.
survey of 750 CTOs, CIOs and senior technology executives across industries, the study reported that IT is integral to competitive advantage as it delivers the capabilities for organizational success. 81% of the strategic IT Connectors surveyed agreed that IT infrastructure is important for competitive advantage, while 40% of business executives noted that cloud computing will become the norm over the next five years. Therefore, IT infrastructure is critical for performance, growth, and survival of organizations in competitive industries (Chakravarty, 2015).

2.2.3. IT Intellectual Infrastructure (Software)

Davenport (2013) noted that information technology plays a major role in operational management of tourism, travel and hospitality industry. Information technology ensures service availability, service integration, and service automation for repetitive tasks and for the management planning and forecasting. Information systems are divided into four broad categories; transaction information systems, management information systems, decision support systems and office information systems. Transaction information system is information system application that capture and process data about business transactions, they are also called data processing systems, they respond to business transactions such as orders or process clients requests (Davenport, 2013). Information systems applications are also employed in operational management-oriented reporting. In hotels, such systems include the Operational Management System (OMS) or central reservations system (CRS) are at the center of both technology and hotel operations. These systems are used to manage the room inventory, record guest details and produce billing information. It often interfaces with other systems such as the telephone systems and food and beverage point of sales terminals to allow integrated billing and management reporting (Liviu, 2015).

According to Mwamure (2013), Operational Management System (OMS) is at the center of both technology and hotel operations. This system is used to manage the room inventory, record guest details and produce billing information. It often interfaces with other systems such as the telephone systems and food and beverage point of sales terminals to allow integrated billing and management reporting. Other hotels part of a Franchise might have Central Reservation Systems (CRS). This allows on booking between hotels as well as the acceptance of direct bookings from a Central Reservation Office (CRO). There are Global Distribution Systems (GDS) which are allocated a block
of rooms within the hotels PMS systems but bookings from the GDS do not automatically update the PMS and must be entered manually. Either the customer or the travel agent makes bookings directly into the system via the internet. It was noted that each of these channels has different costs (Mwamure, 2013).

According to Gilaninia, Balaei, and Niyari (2013) in today’s dynamic and competitive environment, managers must apply innovative solutions to attract and maintain customers. One of the technological solutions is the Electronic Customer Relationship Management (ECRM) system which has been adopted in the tourism and hotel management industry to improve communication between customers and service providers. The implementation of technologies such as ECRM is to achieve competitive advantage while increasing customer satisfaction and retention. A study carried out by the researchers sought to establish the effect of ECRM, which includes aspects such as improving processes, the quality of customer data and the ECRM system technology from the spirit of the model, on competitive advantage. The study was carried out in the City of Sarein. Hotel managers were sampled for the survey and questionnaires were used in data collection. The findings showed that ECRM and its dimensions has a significant impact on competitive advantage (Gilaninia, Balaei, & Niyari, 2013).

Chen (2012) investigated the use of business intelligence for improving business decisions and enhancing organizational agility. The study drew from systems theory and dynamic capabilities framework to understand the relationship between competitive advantage, business intelligence, and IT infrastructure flexibility. The study hypothesized that IT infrastructure and business intelligence are sources of organizational agility and by extension, competitive advantage. The empirical findings demonstrated that information technology and systems have a positive strategic effect on organizational agility and competitive advantage (Chen, 2012).

Mndzebele (2016) noted that electronic commerce (EC) was being adopted by hotels in South Africa as a result of the pressures of globalization and the need to implement innovative technologies to beat competition while at the same time create new opportunities for hotels. The study analyzed the relationship between competition and the extent of electronic commerce adoption in B2B inbound communication and B2B outbound communication. The findings showed that there was a correlation between
competition and e-commerce adoption in the 332 hotels drawn over 7 provinces in South Africa (Mndzebele, 2016).

Kangogo et al., (2013) studied effect of customer communication on performance of the hotel industry in the western tourism circuit of Kenya. The customers reported to be satisfied with reservation, reception, food quality and beverage quality. Costs, security and hotel amenities on the other hand registered fair ratings while provision of personalized services registered dissatisfaction. The researcher also noted that customer satisfaction has positive impacts on market share, service quality, hotel image, sales turnover, and that lack of customer satisfaction results in customer and employee turnover. It is clear with proper technology, the five star hotels would highly increase their competitiveness in the industry.

Kinyua (2012) reported that technology adoption enables human resources managers to handle employees’ queries, organize databases, communication, training, and develop reward programs. One of considerable problems of the hospitality industry is employee turnover. The web-based tool that can help to estimate the overall cost of employee turnover and develop industry norms for turnover-related factors, such as wages, training duration, recruiting practices, drug testing, orientation programs and many other human resources practices. Managers, who are able to organize and manage separate activities better than others by the use of information technology through an appropriate proportion and relation, will experience a higher level of profitability and a more optimum performance. Hospitality organizations are gradually focusing more on knowledge-based competition and on the need for continuous innovation, forcing management to stay abreast of the dynamic developments in the marketplace (Kinyua, 2012).

2.3. The Influence of IT Competencies on Competitive Advantage

2.3.1. Functional Competencies

Functional competencies relate to the possession of skills, abilities and personal characteristics that are necessary for performing tasks at the workplace. IT competencies include adaptability (ability to adjust to changing situations), basic computer use or hardware knowledge, communication, customer service excellence, emergency preparedness, equipment troubleshooting (ability to identify, diagnose and correct technology problems), organizational awareness, organizational skills, problem solving,
teamwork. According to the Association for Computing Machinery Committee (ACM) the core IT competencies can also be grouped into technical competency areas and workplace skills. Technical competency areas include an ability to demonstrate core IT competency in client computing and user support, database and information management, digital media and immersive technology, networking and convergence, programming and application development, and servers, storage and virtualization. On the other hand, workplace skills include the ability to function effectively as a member of a diverse team to accomplish common goals; to read and interpret technical information, as well as listen effectively to, communicate orally with, and write clearly for a wide range of audiences; to engage in continuous learning, as well as research and assess new ideas and information to provide the capabilities for lifelong learning; to exhibit professional, legal, and ethical behavior; and to demonstrate business awareness and workplace effectiveness (ACM, 2014).

According to Fernández-Mesa, Ferreras-Méndez, Alegre-Vidal, and Chiva-Gómez (2013), IT adoption is associated with competitive advantage and improved organizational performance; however, this depends on the ability of a firm to properly utilize IT resources. This is because the tradability of IT means that any firm can access both the hardware and software on the market, hence to develop competitive advantage, a firm must have a different set of capabilities that allow it to utilize IT assets in creating value that cannot be imitated by competitors. In other words, a firm must have IT competency, which generally refers to the ability to control IT-related costs, provide appropriate systems, and improve business strategy through the application of IT. It also encompasses the different assets, skills, knowledge, processes, and relationships that companies acquire, deploy, and manage to improve innovativeness. IT competency is a firm’s ability to deploy IT resources to generate competitive advantage. The researchers investigated the effect of internal and external learning competencies on the competitive advantage of 186 companies. The results indicated that IT competency drives innovation and competitive advantage (Fernández-Mesa, Ferreras-Méndez, Alegre-Vidal, & Chiva-Gómez, 2013).

Gakenia (2015) used the resource-based view of the firm to investigate the nature of the valuable, rare, inimitable and non-substitutable resources that give competitive advantage to mobile phone companies. The study investigated the effect of organizational resources on performance of mobile phone companies in Kenya. The specific dimensions examined
were human capital, technology competencies, and organizational resources. The researcher drew a sample of 170 respondents from four mobile phone companies and administered questionnaires. The findings indicated that human capital had a positive significant effect on performance of mobile phone companies. Technology was found to be significant in explaining the variation of performance of mobile phone companies. Competitive advantage had a partial mediating effect on the influence of organizational resources on performance. Environmental factor had a moderating effect on the influence of organizational resources on performance (Gakenia, 2015).

Kilali (2016) investigated factors influencing adoption of information and communications technology in management of hotels in Kenya with focus on five star hotels in Nairobi County. The factors investigated were the effect of staff literacy, external pressure and online marketing influencing adoption of information and communications technology in management of hotels. The population included 33 five star hotels in Kenya. The findings showed that staff learning, online marketing, and external pressure played a significant role in the adoption of ICT by five star hotels in Kenya. Staff learning as an HRM competency is responsible for operational productivity and customer satisfaction (Kilali, 2016).

Cakmak and Tas (2012) investigated the current use of IT usage in a bid to highlight the role it plays in creating competitive advantage. The study examined the use of IT, benefits and obstacles arise from the use of IT and impacts of IT implementations are determined by undertaking a field survey of a large number of contractor firms in Turkey. The study revealed that Turkish firms used IT at operational level, and this creates technical and economic benefits, as opposed to strategic benefits. The study also reported that even though there are firms that use IT to gain competitive advantage, there was no evidence that such utilization actually created or maintained competitive advantage (Cakmak & Tas, 2012).

Org and Ismail (2008) studied the adoption of ICT among Malaysian SMEs, based on the resource-based view premise that acknowledges that sustainable competitive advantage can only be achieved through building co-specialized ICT competence between ICT facilities in the company and human factors. In the case of SMEs, the entrepreneur must be IT competent to fully exploit ICT technologies. The study showed that acquisition of
IT knowledge, either through education or experience, has positive effects on competitive advantage (Org & Ismail, 2008).

Hoontrakul and Sahadev (2007) carried out a study in Thailand to investigate how ICT was revolutionizing the hospitality sector. The researcher observed that there was a large variation in the propensity of adoption of ICTs among hotels in the country. As such, the researcher was interested in examining the factors affecting a hotel’s propensity to adopt ICTs. Two categories of factors were examined: location-related factor and firm-related factors. The location-related factors were: the percentage of consumers who visit the hotel’s location from high Internet penetration countries, the overall market size of the hotel’s location, and the level of competition between the firms in the locality. The firm related factors considered are: the size of the hotel in terms of the number of rooms, the scope of activities of the hotel in terms of activities that the hotel was engaged in, the grade of the hotel, and the age of the hotel. The researchers collected data from 95 hotels. The study concluded that there was a significant relationship between location factors and firm-specific factors; however, this association was related to the hotel’s intention to target the global tourism market (Hoontrakul & Sahadev, 2007).

2.3.2. Managerial Competencies

From a management point of view, it is important to know whether employees possess the required competencies to achieve successful job performance. Boyatziz (1982) was the first researcher to use the term ‘competency’ in a management context to identify the characteristics that distinguished superior from average performance among US companies. Boyatziz used the term to isolate underlying characteristics of individuals that were causally related to levels of job performance. The researcher established that there were no single, rather multiple factors that differentiated superior from average performers in the organization. These characteristics included personal characteristics, motives, attributes, and experience (Boyatzis, 1982). The human resource function is a core IT competency as it accounts for the skills; knowledge, behaviours, and capabilities needed by a specific job or project and aligns them with organizational strategies and priorities (Draganidis & Mentzas, 2006).

Latest advanced technologies offer the potential to streamline many HR functions, business increasingly are utilizing information technology to design and deliver their HR practices. This trend is not surprising owing to the substantial benefits that are
emerging from the integration of information technology into the HR function. This means that as information technology grows, many of the administrative functions of HRM that can be accomplished through technology will be outsourced. This freeing up of routine tasks by technology creates an opportunity for HR personnel to become strategic partners, and by extension fueling the gradual evolution of the roles and responsibilities of HR personnel. Another way in which technology is causing evolution of HRM is that traditional HR competencies such as those involving administrative tasks have not gone away or have not been outsourced, but rather they have been supplemented by additional skills. As such HR personnel need to be more knowledgeable. There is growing evidence that HR personnel in leading firms are increasingly focusing on strategic issues. The development of HR technologies and workforce analytics is helping to transform HR into a decision science with a measurable impact on business results. The expanded use of the Internet for the delivery of HR applications, especially on a service basis, is also emphasizing the importance of HRIS for organizations of all sizes. These have implications for competencies that define success of professionals in an eHR environment (Lawler & Mohrman, 2003).

Pérez-Aróstegui, Bustinza-Sánchez, and Barrales-Molina (2013) reiterated that the introduction of information technology (IT) has become a necessity to compete in most industries, so simple implementation of an IT strategy is not enough to achieve a better firm performance. Literature review shows IT as a useful tool only when it is combined with other firm resources and practices. The purpose of this paper is to analyze the complementarity between IT and one of the most prevalent and well-established set of organizational practices, Quality management practices (QMP). Structural equation modeling with data collected from managers in 230 Spanish firms shows a positive and significant relationship between IT and QMP (Pérez-Aróstegui, Bustinza-Sánchez, & Barrales-Molina, 2013).

Obonyo, Kambona, and Okeyo (2016) observed how ICT was changing how hotels were conducting their business in the global tourism market, noting that stiff competition has forced hotels to adopt ICT solutions to improve business operations. The researchers investigated the factors behind the growing adoption of ICT by hotels in Kenya. The sample consisted of 10 hotels drawn from Nairobi and Mombasa. The study examined how organizational capacity, technological characteristics, market characteristics, and organization characteristics were influencing ICT adoption, and by extension competitive
advantage. The results revealed a significant association between these factors and adoption (Obonyo, Kambona, & Okeyo, 2016).

Yego (2015), on the other hand, investigated the strategic factors that influence the growth of hotels in Kenya. The specific dimensions investigated were the extent of product diversification within the hotels, use of cost leadership strategies, and level of technology used by hotels in their daily operations. The study sampled three star hotels in Mombasa County. The findings show that all the independent variables studied have significant effect on hotel growth in Kenya as indicated by the strong coefficient of correlation and overall effect of the analyzed factors was very high as indicated by the coefficient of determination. This implies that product diversification, cost leadership and technology have significant effect on hotel growth in Kenya. More importantly, the study noted that the adoption of technology was associated with low cost operations and increased profitability (Yego, 2015).

2.4. The Influence of IT Integration on Competitive Advantage

2.4.1. Human Resource Integration

According to Mishra and Akman (2010) the HRM function in organizations has gained increasing strategic emphasis, and the importance of its alignment HRM and business strategies is well-acknowledged. There is a consensus that effective HRM is vital in order to meet the demands of the market. Information Technology and HRM are intimately related and HR professionals should have the ability to adopt information technologies necessary for re-engineering the HR function while simultaneously achieving speed, efficiency and cost effectiveness. HRM can meet the challenge of simultaneously becoming more strategic, flexible, cost-efficient, and customer-oriented if they leverage information technology. Many experts predicted that computer systems would become the backbone of HRM. This prediction has come to pass with the current virtual HR emerging from the sophistication of IT and increasing external structural options. These complex systems are beginning to allow companies to deliver state of the art HR-services at reduced costs, irrespective of the size of the companies. IT adoption by HR professionals has also enabled the creation of an IT workplace, hence generating strategic competence. In the same vein, advancements in information technology hold the promise for HR challenges such as attracting employees, motivating and retaining employees, while at the same time meeting the demands of a strategic HR function that has the
capacity of effectively managing employees in an increasingly technological oriented workplace (Mishra & Akman, 2010).

Mwithiga, Njihia, and Iraki (2017) noted that there are studies examining the association between IT and firm performance are divergent in how they conceptualize key constructs and their interrelationships. By using a pragmatist philosophical approach coupled with triangulation, the researchers reported that comparative and empirical research on IT and Strategy relationship, inaccurately frames Information Technology (IT) Integration as only a functional-level imperative. This underappreciation of the business-level role of IT Integration is the driving need for the substantial retheorizing of its role in strategy and its complex and interdependent relationship with the mechanisms through which firms generate superior firm performance. This study examined the direct and indirect effects of IT Integration on firm performance, and demonstrated that IT must be deeply integrated with organizational processes and functions to yield competitive advantage (Mwithiga, Njihia, & Iraki, 2017).

Shirandula and Mwawaza (2017) studied the Kenyan hotel industry and observed that small and medium sized hotel enterprises were often flooded with similar easily substitutable service offerings, that are often sub-standard in quality. The adoption of information technology has been touted as an enabler of innovation and can help these hotels achieve competitive advantage through integrating service quality provision and customer service delivery. Shirandula and Mwawaza (2017) explored the drivers of adoption and how it affects overall performance. The findings showed that to achieve operational efficiency hotels must adopt basic technologies and streamline their processes through integration (Shirandula & Mwawaza, 2017).

2.4.2. Organizational Integration

In one of the earlier studies on IT integration in the United States market, Siguaw, Enz, & Namasivayam (2000) observed that the degree to which the hospitality industry had embraced technological innovations was inequovical. However, while some researchers maintained that technology adoption in the hospitality industry was extensive, noting the evidence for acceptability and widespread use of IT in service provision such as lodging, others argued that the hospitality industry lagged behind other industries in adoption of new IT innovations. As a result, the study sought to examine the extensiveness of and strategic priorities that form technology use in the lodging industry. The study used two
unique samples of US hotels to examine utilization of IT in all hotel segments, from
deluxe to budget, in order to reveal similarities and differences. The results showed that
the U.S. lodging industry has focused on employing technologies that improve employee
productivity and enhance revenue but has not given strategic priority to technologies
designed to improve guest services. The hotel sector, lodging type, size/complexity of the
property, and independent versus chain affiliation influenced the number and type of
technologies adopted. Luxury and upscale hotels adopted more IT than economy and
budget hotels. Similarly, IT development was greatest for certain lodging types such as
convention hotels, conference centers, and casinos, and lowest for other types, such as
motels and bed-and-breakfasts. Chain-affiliated properties typically adopted more
technologies than independent hotels (Siguaw, Enz, & Namasivayam, 2000).

In more recent research on the United States market, Ivanov and Webster (2017) note that
the travel, tourism and hospitality industry has started adopting even more advanced
forms of information technology such as robots, artificial intelligence and service
automation (RAISA), as manifested by chatbots, delivery robots, robot concierge,
conveyor restaurants, self-service information/check-out kiosks among others. In the
study, the researchers investigated the costs and benefits of the adoption of RAISA by
travel, tourism, and hospitality companies, particularly hotels, restaurants, event
organizers, theme and amusement parks, airports, car rental companies, travel agencies
and tourist information centers, museums and art galleries and others. The research
looked at how RAISA influences competitiveness, service quality, human resource
management, service operations processes and standards, hospitality facilities layout,
operating costs and revenues. It also investigated the conditions under which the adoption
of RAISA would yield the greatest benefit. The results show that the financial benefits of
RAISA include labor costs savings, increased sales, and enhanced employees. The non-
financial benefits are enhanced perceived service quality, value for customers, and time
saving by replacing employees doing tedious work. However, there were costs such as
acquisition costs, installation costs, maintenance costs, software update costs, costs for
hiring specialists and staff training costs. Non-financial costs were the resistance to
technology. The study concluded that benefits and costs are very diverse and managers
needs to consider all of them before deciding to adopt or not the new technology (Ivanov
& Webster, 2017).
Bilgihan, Nusair, Okumus, and Kwun (2011) proposed a conceptual framework illustrating how IT applications can lead to competitive advantage in hotels. The four areas isolated by the hotels were coherence between the business strategy and IT decision, types of IT applications, intended benefits of IT decisions, and decision-making style. Technology sophistication, management skills, and integration of resources are key issues when implementing IT decisions. Investments into IT applications in hotel companies can lead to superior IT competencies and IT capabilities, which can subsequently result in lower cost, agility, innovation, added value for customers, and better customer service. However, not all IT investments may result in positive outcomes or their sustainability may be short lived. In addition, there can be a lag time between making IT investment decisions and seeing their intended outcomes (Bilgihan, Nusair, Okumus, & Kwun, 2011).

2.4.3. Physical Integration

According to Kim, Shin, Kim, & Lee (2011) IT integration includes the advancement and reconfiguration of information technology to bolster business systems. IT integration is the use of IT tools in business operations so as to bring a positive impact on performance. IT adaptability is an essential part of IT integration, or how IT integrates with other physical, human, and organizational functionalities in your organization. IT integration includes how IT tools streamline the linkages between human organizational and physical. The human aspects of integration are IT management capabilities, IT personnel and IT expertise. The organizational aspects are IT business partnerships/ linkages (external business and IT vendors) and IT business process integration. The physical aspects relate to IT infrastructure flexibility (Kim, Shin, Kim, & Lee, 2011).

Morabito (2010) investigated the effect of IT integration on competitive advantage. The researcher proposed that IT business value is generated by the deployment of IT and complementary organizational resources. The study used a sample of 466 top managers in Italian companies. The findings demonstrated that most of the firms have not merged information system (IS) integration with the right complementary organizational resources. The findings also support the notion that competitive advantage does not arise from replicable resources, but from complex, firm-specific and intangible resources and capabilities. The findings help to explain why some firms struggle while others flourish.
with the same ITs, and why IT-based advantages tend to dissipate so rapidly (Morabito, 2010).

Maiga (2015) reviewed existing literature and found out that there were mixed results with regard to the effect of information technology integration and Activity-Based Costing (ABC) on organizational performance. Drawing from information systems, accounting, marketing, and management literature, Maiga (2015) carried out a study to assess whether manufacturing plant IT integration impacts its extent of ABC use and whether there was a direct relation between both IT integration and extent of ABC use and plant performance, or whether both IT integration and extent of ABC use impact plant performance through low-cost and product differentiation strategies. The results of the study showed that IT integration significantly affects the extent of ABC use, and that both IT and ABC use significantly affect low-cost strategy and product differentiation strategy that, in turn, impact both market performance and profitability (Maiga, 2015).

Maiga, Nilsson, and Ax (2015) focused on the effect of information systems integration on the profitability of manufacturing firms. The study used structural equation modelling to investigate the associations between internal and external information system integration, quality and cost performance, and profitability. The researchers sampled 263 members of the Institute for Supply Management and administered the survey through the mail. The findings showed that there was a positive and significant association between information systems integration and cost and quality performance, that quality performance was significantly associated with cost performance, and that both the quality and cost performance had a positive effect on firm profitability (Maiga, Nilsson, & Ax, 2015).

Liviu (2015) reported that the adoption of information systems adoption and implementation improves the organization performances (efficiency, productivity, organization competitiveness and development among others). However, the potential for IT resources is maximized when IT investments are aligned with internal capabilities and organizational processes within company strategy, hence the importance of integration (Liviu, 2015).
2.5. Chapter Summary

The chapter presents the theories underpinning the study and critically synthesizes empirical literature on the relationship information technology and competitive advantage. The review is aligned with the research objectives to capture the effects of IT infrastructure, IT competency, and IT integration on competitive advantage. The literature review shows that there is a paucity of research on the effect of information technology in the hotel industry in Kenya, with particular focus on the dimensions of IT that was investigated in this study. The next section is Chapter three, which presents the methodological approach adopted in the study.
CHAPTER THREE

3.0. RESEARCH METHODOLOGY

3.1. Introduction

This chapter describes the research design and methodology for the study. It specifically
provides for the design that was adopted, the target population and sampling frame,
sampling design and sample size, sampling procedure, data collection and data analysis
methods used in conducting the research.

3.2. Research Design

A descriptive research design was adopted in the study. A research design is defined as a
scheme, outline or plan that is used to generate answers to research problems. It is the
structure of the research that holds all the elements in a research project together (Cooper
& Schindler, 2006). A descriptive study is concerned with finding out the what, where
and how of a phenomenon. It enables the researcher to collect quantitative data from the
target population to answer the researchers questions (Mugenda & Mugenda, 2008). The
choice of a descriptive research design is appropriate due to the fact that these designs
help to provide answers to the ‘who’, ‘what’, ‘when’, ‘where’, and ‘how’ questions that
are associated with a particular research problem. The design helped the researcher to
obtain information about the current status of the phenomena and to describe ‘what
exists’ with regard to the variables or the conditions under examination (Thyer, 2010).

3.3. Population and Sampling Design

3.3.1. Population

The population of the study is 127 managers drawn from 10 five-star hotels in Nairobi
County (Tourism Regulatory Authority, 2018). The population of the study include Hotel
Managers: General Manager, Operations Manager, Housekeeping Manager, Sales and
Marketing Manager, Food and Beverage Manager, Events and Catering Manager,
Finance Manager, Human Resources Manager, Maintenance/Facilities Manager, Human
Resource Manager, Information Technology Manager, and Chief of Security drawn from
the 10 five-star hotels in Nairobi County. A population element is the subject such as a
person an organization, customer database, or the amount of quantitative data on which
the measurement is being taken (Mugenda & Mugenda, 2008). The choice of managers
from all the five-star hotels in the County is therefore the appropriate population for this study.

Table 3.1: Population

<table>
<thead>
<tr>
<th>Hotels</th>
<th>Managers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Villa Rosa Kempinski</td>
<td>14</td>
</tr>
<tr>
<td>2. Hemingway’s Nairobi</td>
<td>10</td>
</tr>
<tr>
<td>3. Sankara Nairobi</td>
<td>15</td>
</tr>
<tr>
<td>4. Fairmont The Norfolk</td>
<td>12</td>
</tr>
<tr>
<td>5. Tribe Hotel</td>
<td>11</td>
</tr>
<tr>
<td>6. The Sarova Stanley</td>
<td>8</td>
</tr>
<tr>
<td>7. Radisson Blue Hotel Nairobi</td>
<td>18</td>
</tr>
<tr>
<td>8. Dusit D2</td>
<td>16</td>
</tr>
<tr>
<td>9. Intercontinental Nairobi</td>
<td>14</td>
</tr>
<tr>
<td>10. The Boma Nairobi</td>
<td>9</td>
</tr>
<tr>
<td>TOTAL</td>
<td>127</td>
</tr>
</tbody>
</table>

3.3.2. Sampling Design

3.3.2.1. Sampling Frame

The sampling frame for this study was a listing of managers of 10 five star hotels in Nairobi County. The list was obtained from each five star hotel’s Human Resources Manager. The sampling frame refers to the listing of all population elements from which the sample is drawn and is closely related to the population (Cooper & Schindler, 2008). The list of managers from each hotel is chosen because it provides a complete and correct list of population members only.

3.3.2.2. Sampling Technique

This study utilized a stratified random sampling to select respondents. Sampling is the process of selecting a number of individuals for a study in such a way that the individual selected represents the population. Sampling procedure may be defined as a systematic process of individuals for a study to represent the larger group from which they are selected. A procedure that stratifies the population then samples it is known as stratified random sampling method (Cooper & Schindler, 2008). Stratified random sampling is appropriate when the population to be sampled can be divided into strata or layers on the basis of supplementary information available, and that the units within each stratum are
more or less homogenous. In this case, the managers for different departments represents the population sub-group from which the sample is obtained.

3.3.2.3. Sample Size

The sample size for this study was 60 managers from 10 five star hotels in Nairobi County. This study will select 6 Managers (General Manager, Operations Manager, Sales and Marketing Manager, Finance Manager, Human Resource Manager, and Information Technology Manager) from each of the 10 five star hotels. A sample size is defined as the number of individual samples measured or observations in a survey. Sample size determination takes into account the total size of the population being studied to ensure that the sample is representative of the population being studied. In this case, the sample was drawn from each of the relevant departments in each five star hotel, as presented in Table 3.2.

Table 3.2: Sample Size

<table>
<thead>
<tr>
<th>Managers</th>
<th>Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Managers</td>
<td>10</td>
</tr>
<tr>
<td>Operations Managers</td>
<td>10</td>
</tr>
<tr>
<td>Sales and Marketing Managers</td>
<td>10</td>
</tr>
<tr>
<td>Finance Managers</td>
<td>10</td>
</tr>
<tr>
<td>Human Resources Manager</td>
<td>10</td>
</tr>
<tr>
<td>Information Technology Managers</td>
<td>10</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>60</strong></td>
</tr>
</tbody>
</table>

3.4. Data Collection Methods

Primary data was sourced from the questionnaires by the respondents. The closed-ended questionnaires used a 5-point Likert scale to score responses. The questionnaire was divided into five sections. Section ‘A’ will collect information on demographic characteristics, Section B collected information on IT infrastructure, Section C collected information on IT competencies, Section D collected information on IT integration, and Section E collected information on competitive advantage.

Data collection is the process of gathering and measuring information on variables of interest, in an established systematic fashion that enables one to answer stated research questions, test hypotheses, and evaluate outcomes (Thyer, 2010). Closed-ended
questionnaires are used to collect survey responses within a limited frame of questions and represent the foundation of all statistical analysis techniques applied on questionnaires and surveys. Closed-ended questions limit the answers that respondents can give to the options provided. Closed ended can be questions scaled questions that use rating scales such as the five-point Likert scales. The advantage of using closed-ended questions is that it is time efficient, responses are easy to code and interpret, and it is ideal for quantitative type of research. The main disadvantage is that respondents are required to choose a response that does not exactly reflect their answer. Closed-ended questions are different from open-ended questions where there are no predetermined options and participants supply their own answer. Open-ended questions are ideal for qualitative research (Sincero, 2018). As a result, closed ended questions are most appropriate for this study.

3.5. Research Procedures

The data collection instrument was subjected to a pre-test before the actual data collection. A sample of 10 respondents (one manager from each of the 10 five star hotels) was selected for the pilot study. This sample, pre-test sample which includes managers who will not be included in the actual study, represents 17% of the sample size. Mugenda and Mugenda (2003) recommends a pre-test sample of at least 10% of the sample size. The questionnaires were self-administered and the responses entered into IBM SPSS statistical software for reliability analysis. Questions that are not clear and ambiguous were restructured to eliminate ambiguity and improve clarity. All problems encountered in the pilot testing were addressed and the questionnaire refined before the actual data collection.

The researcher used a drop and pick method to deliver questionnaires to each of the managers in the 10 five star hotels selected for the study. The researcher collected completed questionnaires after 5 days. For questionnaires that would not have been completed by the elapse of 5 days, the researcher reminded the respondents through phone calls to improve the response rate, and collect the completed instruments 5 days after the reminders. All the questionnaires were administered over a 14 days period. The collected questionnaires were stored for data analysis.

The validity was established by subjecting the questionnaire to a panel of experts and academic colleagues to establish whether the constructs represents what is being
measured. The validity of a questionnaire is the degree to which it measures what it purports to measure (Bolarinwa, 2015). This focused on examining both the face validity and the content validity. Peer review was also be used to attract responses on the questionnaire which are then used to improve it before administration (Seyyedamiri & Faghih, 2015).

Based on the responses from the administration of the questionnaire during pilot testing, the reliability was established by determining the internal consistency of items representing each construct using the Cronbach Alpha Index. Scores above 0.07 was judged as satisfactory. (Olanye & Eromafuru, 2016). The results of reliability analysis indicated a Chronbach Alpha index of 0.715, implying that the questionnaire had achieved the desired reliability level necessary for the generation of valid results.

3.6. Data Analysis Methods

All completed questionnaires were coded and entered into an Excel sheet for cleaning, and then imported into IBM SPSS statistical software for analysis. The responses were analyzed for descriptive and inferential statistics. Descriptive statistics was used to summarize the data into frequencies, percentages, mean, and standard deviation for all the independent variables (IT infrastructure, IT competencies, IT integration) and dependent variable (competitive advantage).

Inferential statistics was be used to establish the relationship between the independent and dependent variables. The study used correlation analysis to determine if is there is a possible relationship between the variables. Pearson’s product-moment coefficient was used to measure the strength of the relationship. The coefficients range between +1 and -1. +1 indicates the strongest positive correlation possible, and -1 indicates the strongest negative correlation possible. Therefore the closer the coefficient to either of these numbers the stronger the correlation of the data it represents. On this scale 0 indicates no correlation, hence values closer to zero highlight weaker/poorer correlation than those closer to +1/-1.

The study used multiple regressions to determine the relationship between information technology and competitive advantage among five star hotels in Nairobi County. Multiple regression is used to predict the value of the dependent variable based on the value of the dependent variables.
The regression model for the study took the form of:

\[ y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \epsilon \]

Where \( y \) intercept is the endogenous variable (independent variable)

\( \alpha \) denotes the \( y \) intercept where \( x \) is zero

\( \beta_1, \beta_2, \) and \( \beta_3 \) are regression weights attached to the exogenous variables (independent variables): \( X_1, X_2, \) and \( X_3 \)

\( \epsilon \) is the error term.

Replacing for the variables:

\[ CA = \alpha + \beta_1 \text{INF} + \beta_2 \text{COMP} + \beta_3 \text{INT} + \epsilon \]

Where \( CA \) is competitive advantage

\( \alpha \) denotes the \( y \) intercept where \( x \) is zero

\( \text{INF} \) is IT infrastructure

\( \text{COMP} \) is IT competencies

\( \text{INT} \) is IT integration, and

\( \epsilon \) is the error term.

The coefficients and their 95% confidence interval was reported as well as p-values. The findings for both descriptive and inferential statistics were presented in tabular and graphical presentations (pie charts, bar graphs) in addition to an analytical and narrative description of the results.

3.7. Chapter Summary

This chapter has presented the research methodology that was adopted to conduct this study. This study adopted a descriptive research design. The study population comprised of 127 managers from 10 five star hotels in Nairobi, out of which 60 respondents were selected for the study. Data was collected using a pre-tested and standardized questionnaire. Data was analyzed using descriptive and inferential statistics. The results are presented using charts, graphs, and tables.
CHAPTER FOUR

4.0. RESULTS AND FINDINGS

4.1. Introduction

This chapter presents the results and findings of the study, in charts, graphs, and tables. The presentation is aligned with the research objectives and accompanied by the interpretation of the findings.

4.2. General Information

4.2.1. Response Rate

The researcher administered questionnaires to 60 managers from 10 five star hotels in Nairobi County. Out of these, 46 were completed and returned for data analysis. This represents a 77% response rate. The high response rate was satisfactory for the study.

4.2.2. Gender

A majority of the managers who participated in the study were female, representing 54.3% of the sample, with the rest, 45.7% being male. The results are presented in Figure 4.1.

Figure 4.1: Gender
4.2.3. Age

All the managers were above 30 years old. A majority of the managers were aged between 41-50 years old, 65.2%. 21.7% were aged between 31-40 years and only a minority, 13% were above 51 years old.

![Age Distribution Pie Chart](image)

**Figure 4.2: Age**

4.2.4. Duration Managers Had Worked in the Hotel

A majority has been at the hotel between 1-3 years, notably 45.7% (1-2 years) and 41.3% (2-3 years). 6.5% had been at the hotel for less than 1 year and a similar number between 3-4 years.

![Duration Worked at Hotel Bar Chart](image)

**Figure 4.3: Duration Worked at Hotel**
4.2.5. Level of Education

All the managers either had an undergraduate degree or a Masters degree. There were no managers with secondary or certificate/diploma qualifications as their highest level of education. Further, no manager had acquired a PhD. The majority had a Masters degree (52.2%) and the rest had a degree (47.8%).

![Level of education chart]

**Figure 4.4: Level of Education**

4.2.6. Number of beds

The number of beds/rooms is the most common indicator of hotel size. For the hotels surveyed, A majority had 150-200 rooms (39.1%), followed by 100-150 rooms (26.1%) and more than 200 rooms (21.7%). Only 13% of the hotels had less than 100 rooms.

![Number of beds/rooms chart]

**Figure 4.5: Number of beds/rooms**
4.2.7. Years of Hotel Operations

Most of the hotels have been operating for more than 7 years, 47.8%, and a further 13% for 5-7 years. However, 26.1% have only been in operation for 3-5 years and 1-3 years (13%).

![Graph: Years of Hotel Operation](image)

**Figure 4.6: Years of Hotel Operations**

4.2.8. Years of Operations as a 5 Star Hotel

Similar to the years of operation, a majority of the hotels, 43.5%, had also operated as 5 star hotels for the longest duration, 3-4 years. 26.1% had operated as five star hotels over the past 2-3 years, 17.4% for more than 5 years, and 13% only over the past 1-2 years.

![Graph: Years of Operation as a 5 Star Hotel](image)

**Figure 4.7: Years of Operation as a 5 Star Hotel**
4.2.9. Number of Employees

Slightly over half of the hotels, 56.5%, had 100-150 employees and 26.1% had more than 200 employees. On the contrary, a similar number, 8.7%, had 150-200 employees and 50-100 employees.

![Number of employees](image)

**Figure 4.8: Number of Employees**

4.3. IT Infrastructure and Competitive Advantage

IT infrastructure is a core component of firm resources, which include the assets and capabilities that are controlled by a firm and enable it to develop and implement strategies for improving efficiency and effectiveness. The IT infrastructure constituted the physical IT resources adopted by the 5-star hotel to run organizational processes. In this study, the focus was on the extent to which the hotels had adopted IT infrastructure to manage core processes. The results presented in Table 4.1 show a very high level of agreement among the managers. When asked to state the extent to which information communication and technology applications were being used to perform core hotel functions; 87% agreed to a large extent that IT was the backbone for booking and 73% that it was being used for front office operations. The level of utilization of IT applications was very high in customer relationship management (95.7%), restaurant management (95.7%), financial management (95.7%), business intelligence and analytics (95.7%), warehouse and inventory management (93.5%), and housekeeping (91.3%). A summary of the 5-point Likert type responses into means indicates that all the hotels had adopted highly complex IT infrastructure to drive all core functions, as indicated by means ranging from front office operations, M=4.65, to customer relationship management, M=4.96.
Table 4.1: IT Infrastructure

<table>
<thead>
<tr>
<th>Service</th>
<th>Not at all</th>
<th>Small extent</th>
<th>Moderate extent</th>
<th>High extent</th>
<th>Very high extent</th>
<th>Mean</th>
<th>Std. deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservations and room booking</td>
<td>0</td>
<td>0</td>
<td>8.7</td>
<td>17.4</td>
<td>73.9</td>
<td>4.65</td>
<td>0.640</td>
</tr>
<tr>
<td>Front office operations</td>
<td>0</td>
<td>0</td>
<td>8.7</td>
<td>17.4</td>
<td>73.9</td>
<td>4.65</td>
<td>0.640</td>
</tr>
<tr>
<td>Customer relationship management</td>
<td>0</td>
<td>0</td>
<td>8.7</td>
<td>17.4</td>
<td>73.9</td>
<td>4.65</td>
<td>0.640</td>
</tr>
<tr>
<td>Housekeeping</td>
<td>0</td>
<td>0</td>
<td>8.7</td>
<td>17.4</td>
<td>73.9</td>
<td>4.65</td>
<td>0.640</td>
</tr>
<tr>
<td>Financial management (payroll, POS etc)</td>
<td>0</td>
<td>0</td>
<td>8.7</td>
<td>17.4</td>
<td>73.9</td>
<td>4.65</td>
<td>0.640</td>
</tr>
<tr>
<td>Business intelligence and analytics</td>
<td>0</td>
<td>0</td>
<td>8.7</td>
<td>17.4</td>
<td>73.9</td>
<td>4.65</td>
<td>0.640</td>
</tr>
</tbody>
</table>

4.4. IT Competencies and Competitive Advantage

IT competencies evaluated reflected not only the technical domains, such as user support, databases and information management, digital media, programming, storage, virtualization, and information security, among others but also the soft skills necessary in the workplace environment such as professional behavior, ethical conduct, and societal concerns around technologies. When asked whether they had soft skills in basic computer operations such as Microsoft Office and Email, 97.9% (M=4.98) indicated strong agreement. In the same vein, the managers had the ability to identify, diagnose and correct technological problems (95.7%, M=4.96), use IT to build relationships with stakeholders (95.7%, M=4.96), use IT to process data and results for strategic decision-making (95.7%, M=4.96), and were aware of security issues associated with using distributed IT systems (97.8%, M=4.96). All the managers surveyed routinely used IT for communication, negotiation and collaboration with workplace teams; were aware of significant trends in technological innovation that could affect the hotel industry; and understood the legal, ethical, cultural and societal issues related to the adoption and use of ICT (100%, M=5.00).
Table 4.2: IT Competencies

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>skills in basic computer operations</td>
<td>0</td>
<td>0</td>
<td>2.2</td>
<td>97.9</td>
<td>4.98</td>
<td>0.147</td>
</tr>
<tr>
<td>such as Microsoft Office and email</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ability to identify, diagnose and</td>
<td>0</td>
<td>0</td>
<td>4.3</td>
<td>95.7</td>
<td>4.96</td>
<td>0.206</td>
</tr>
<tr>
<td>correct technology problems</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use IT for communication,</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>100</td>
<td>5.00</td>
<td>0.000</td>
</tr>
<tr>
<td>negotiation and collaboration</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>with my team at the workplace</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use IT systems to build</td>
<td>0</td>
<td>0</td>
<td>4.3</td>
<td>95.7</td>
<td>4.96</td>
<td>0.206</td>
</tr>
<tr>
<td>relationships with customers and</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>suppliers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use IT to process data and report</td>
<td>0</td>
<td>0</td>
<td>4.3</td>
<td>95.7</td>
<td>4.96</td>
<td>0.206</td>
</tr>
<tr>
<td>results</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aware of significant trends and</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>100</td>
<td>5.00</td>
<td>0.000</td>
</tr>
<tr>
<td>emerging technologies</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aware of the security issues</td>
<td>0</td>
<td>0</td>
<td>2.2</td>
<td>97.8</td>
<td>4.96</td>
<td>0.147</td>
</tr>
<tr>
<td>Understands the legal, ethical,</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>100</td>
<td>5.00</td>
<td>0.000</td>
</tr>
<tr>
<td>cultural, and societal issues</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>related to technology.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4.5. IT Integration and Competitive Advantage

The study sought to establish how IT infrastructure and capabilities are reorganized and reconfigured through the process of integration to ensure that they drive business processes and generate competitive advantage. To this end, three levels of integration were analyzed: human resource integration, organizational integration and physical integration. On human resource integration, nearly all the managers indicated that all the managerial personnel possess IT management capabilities necessary for maximum exploitation of IT resources (97.8%, M=4.98) and that the hotels had installed electronic human resource management (eHRM) application to manage human capital. In terms of organizational integration, a similar majority noted that the IT systems in the hotels linked all functional departments (97.8%, M=4.98) as well as external stakeholders such as suppliers (97.8%, M=4.98). On physical integration, the managers were convinced that their hotels had the best IT system (97.8%, M=4.98), which connected all branches (97.8%, M=4.98). Finally, IT integration allowed the hotel to provide a wide variety of information to end users (95.7%, M=4.93) as well as share information seamlessly across the organization (97.8%, M=4.98).
Table 4.3: IT Integration

<table>
<thead>
<tr>
<th>Human resource integration</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Managerial personnel have the IT management capabilities</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2.2</td>
<td>97.8</td>
<td>4.98</td>
<td>0.147</td>
</tr>
<tr>
<td>Uses of electronic human resource management (eHRM)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2.2</td>
<td>97.8</td>
<td>4.98</td>
<td>0.147</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Organizational integration</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT systems links all departments at the hotel</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2.2</td>
<td>97.8</td>
<td>4.98</td>
<td>0.147</td>
</tr>
<tr>
<td>IT systems links the hotel with external partners such as suppliers</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2.2</td>
<td>97.8</td>
<td>4.98</td>
<td>0.147</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Physical integration</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hotel has the best available IT systems and connections compared to competitors</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2.2</td>
<td>97.8</td>
<td>4.98</td>
<td>0.147</td>
</tr>
<tr>
<td>All branches/offices are connected to the central office</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2.2</td>
<td>97.8</td>
<td>4.98</td>
<td>0.147</td>
</tr>
<tr>
<td>Organization offers a wide variety of information to end users</td>
<td>0</td>
<td>0</td>
<td>2.2</td>
<td>2.2</td>
<td>95.7</td>
<td>4.93</td>
<td>0.327</td>
</tr>
<tr>
<td>Information is shared seamlessly across our organization, regardless of the location</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2.2</td>
<td>97.8</td>
<td>4.98</td>
<td>0.147</td>
</tr>
</tbody>
</table>

4.6. Information and Communication Technology on Competitive Advantage

The study used Pearson correlations to determine the relationship between the variables. Correlation analysis estimates the sample correlation coefficient. With Pearson correlations, study estimated the Pearson Product Moment correlation coefficients, \( r \), for all the variables. The coefficients showed the strength of the linear relationships between the variables.

The results showed that there was a weak positive correlation between IT infrastructure \( (r=0.239, p=0.110) \) and IT integration \( (r=0.290, p=0.050) \), while the correlation with
competitive advantage was negative \((r=-0.154, \ p=0.308)\). IT competencies exhibited a weak positive correlation with IT infrastructure \((r=0.239, \ p=0.110)\) and a strong and positive correlation with IT integration \((r=0.539, \ p=0.000)\) and competitive advantage \((r=0.486, \ p=0.001)\), which was statistically significant at 0.01 level). IT integration had a weak positive correlation with IT infrastructure \((r=0.290, \ p=0.050)\), but a strong, positive, and significant correlation with IT competencies \((r=0.539, \ p=0.000)\) and competitive advantage \((r=0.514, \ p=0.000)\). Finally, there was a weak and negative correlation between competitive advantage and IT infrastructure \((r=-0.154, \ p=0.308)\), but a strong, positive, and significant correlation with IT competencies \((r=0.486, \ p=0.001)\) and IT integration \((r=0.514, \ p=0.000)\), which was statistically significant at 0.01 level). The results are presented in Table 4.4.

Table 4.4: Pearson Correlations

<table>
<thead>
<tr>
<th></th>
<th>IT infrastructure</th>
<th>IT competencies</th>
<th>IT integration</th>
<th>Competitive advantage</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT infrastructure</td>
<td>1</td>
<td>.239</td>
<td>.290</td>
<td>-.154</td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.110</td>
<td>.050</td>
<td>.308</td>
<td></td>
</tr>
<tr>
<td>IT competencies</td>
<td>.239</td>
<td>1</td>
<td>.539**</td>
<td>.486**</td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.110</td>
<td>.000</td>
<td>.001</td>
<td></td>
</tr>
<tr>
<td>IT integration</td>
<td>.290</td>
<td>.539**</td>
<td>1</td>
<td>.514**</td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.050</td>
<td>.000</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td>Competitive advantage</td>
<td>-.154</td>
<td>.486**</td>
<td>.514**</td>
<td>1</td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.308</td>
<td>.001</td>
<td>.000</td>
<td></td>
</tr>
</tbody>
</table>

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

Multiple regression was used to establish the relationship between information technology and competitive advantage among five star hotels in Nairobi County. Multiple regressions predict the effect of the independent variable on the dependent variable. The regression model presented in Chapter 3, Section 3.6.

The results indicate an R Square of 0.444. While R is the correlation between the observed and predicted values of the dependent variables (IT infrastructure, IT competencies, IT integration), R Square is the proportion of the dependent variable (competitive advantage) explained by the independent variables. Therefore, these findings show that IT variables are responsible for a 44.4% change in competitive advantage in 5 star hotels in Nairobi County, as presented in Table 4.5.
Table 4.5: Model Summary

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.666a</td>
<td>.444</td>
<td>.404</td>
<td>.0825</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), IT integration, IT infrastructure, IT competencies

Analysis of Variance (ANOVA) was used to test the regression model before estimation of parameters. Taking the null hypothesis to be: *IT is a significant predictor of competitive advantage*, the model shows that information technology is a statistically significant predictor of competitive advantage, $p=0.000$ at 0.005 confidence level. The null hypothesis is accepted.

Table 4.6: ANOVA

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>Df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Regression</td>
<td>.228</td>
<td>3</td>
<td>.076</td>
<td>11.162</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>.286</td>
<td>42</td>
<td>.007</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>.514</td>
<td>45</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Dependent Variable: Competitive advantage
b. Predictors: (Constant), IT integration, IT infrastructure, IT competencies

The Table 4.7 presents the parameter estimates for the regression model. The constant, denotes the predicted value of competitive advantage when all the IT variables are 0. The findings show that there is a negative and significant relationship between IT infrastructure and competitive advantage ($B=-0.289$, $t=-2.985$, $p=0.005$). This means that 1 unit increase in IT infrastructure decreases competitive advantage by 0.289. In essence, any additional investments in IT infrastructure would not lead to an increase in cost-efficiency, quality service provision, faster delivery, operational flexibility, or profitability of the five star hotels.

The results show a positive and significant relationship between IT competencies and competitive advantage ($B=0.592$, $t=-2.449$, $p=0.019$) at 0.05 confidence level. This means that 1 unit increase in IT competencies increases competitive advantage by 0.592. Finally, there was a positive and significant relationship between IT integration and competitive advantage ($B=0.475$, $t=-3.137$, $p=0.003$) at 0.05 confidence level, implying that a 1 unit increase in IT integration increases competitive advantage by 0.475.
Table 4.7: Regression Coefficients

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>(Constant)</td>
<td>1.058</td>
<td>1.034</td>
<td>1.023</td>
</tr>
<tr>
<td></td>
<td>IT infrastructure</td>
<td>-.289</td>
<td>.097</td>
<td>-.361</td>
</tr>
<tr>
<td></td>
<td>IT competencies</td>
<td>.592</td>
<td>.242</td>
<td>.336</td>
</tr>
<tr>
<td></td>
<td>IT integration</td>
<td>.475</td>
<td>.152</td>
<td>.437</td>
</tr>
</tbody>
</table>

a. Dependent Variable: Competitive advantage

Replacing for the values in the regression model:

\[
CA = \alpha + \beta_1 \text{INFR} + \beta_2 \text{COMP} + \beta_3 \text{INT} + \epsilon
\]

The relationship between information and communication technology and competitive advantage can be presented as:

\[
CA=1.058 - 0.289\text{INF} + 0.592\text{COMP} + 0.475\text{INT} + 1.034
\]

4.7 Chapter Summary

This chapter presents the results and findings of the study accompanied by a narrative explanation. The descriptive results encompass general biographic information, including gender, age, level of education, and number of years working at the hotel, as well as hotel specific characteristics such as number of rooms, number of employees, years of operations, and years of operation under the five star classification. The section details both the descriptive and inferential statistics for the research objectives; notably, the influence of IT infrastructure, IT competencies, and IT integration on competitive advantage. All the results are presented in tables and graphs. The next chapter discusses the findings and recommends areas of improvement in research and practice.
CHAPTER FIVE

5.0. DISCUSSIONS, CONCLUSIONS, AND RECOMMENDATIONS

5.1. Introduction

This chapter presents summary of findings, which details the research objective, methodology, and the results and findings of the study, as per the research objectives. The section also presents the discussions for each objective, conclusions and recommendations.

5.2. Summary of the Study

The study sought to establish the effect of information and communication technology on the competitive advantage of five star hotels in Nairobi County. The research objectives captured three dimensions of information and communication technology: IT infrastructure, IT competencies, and IT technology. The investigated the effect of IT infrastructure on competitive advantage; the effect of IT competencies on competitive advantage; and the effect of IT integration on competitive advantage in five star hotels in Nairobi County.

The study adopted a descriptive research design to investigate the research objectives. The population of the study 127 managers from 10 five star hotels, as classified by The Tourism Authority (2018). The population included the following managers from each hotel: General Manager, Operations Manager, Housekeeping Manager, Sales and Marketing Manager, Food and Beverage Manager, Events and Catering Manager, Finance Manager, Human Resources Manager, Maintenance/Facilities Manager, Human Resource Manager, Information Technology Manager, and Chief of Security. A sample size consisting of six managers from each hotel was drawn for the study, totaling to 60 managers. The researcher used questionnaires to collect data from the respondents. These questionnaires were administered at the manager’s offices. All completed questionnaires proceeded to data analysis. Data was analyze for descriptive statistics (percentages, mean and standard deviations). The relationships between the variables was established using correlation and regression analysis.

The descriptive statistics show a very high level of agreement with statements on IT infrastructure, IT competencies, and IT integration. The regression analysis shows that
there is a negative and significant relationship between IT infrastructure and competitive advantage. On the contrary, both IT competencies and IT integration had a positive and significant effect on competitive advantage.

5.3. Discussions

5.3.1. IT Infrastructure and Competitive Advantage

Infrastructure is the foundational system on which services are run, it’s the base on which functions operates. IT infrastructure includes all the technological tools, such as computers, software and telecommunication systems, used to manage and exchange knowledge by an organization. Ghyesari et al (2013) noted that this kind of infrastructure can be physical, intellectual or procedural assets. In a hotel system, IT plays the role of service availability, service integration and service automation, as well as financial management, strategic planning and forecasting (Davenport, 2013). There are various studies that have looked at the link between information technology and organizational performance, and by extension the generation of competitive advantage.

In this study, the results show that there was a very high level of adoption and use of IT hardware and software relating to the hospitality industry. There was high level of agreement among managers that information communication and technology applications were being used to perform core hotel functions. IT formed the backbone for booking, front office operations, customer relationship management, restaurant management, financial management, business intelligence and analytics, warehouse and inventory management, and housekeeping.

These results agree with several authors that have also investigated the utilization of IT in hotel operations. A majority of managers recognize the importance of IT infrastructure (Chakraverty, 2015). Chen (2012) established that IT enhances organizational agility and competitive advantage. Gililaninia, Balaei and Niyari (2013) opined that implementation of IT solutions such as electronic customer relationship management enhances competitive advantage because it improves processes and the quality of customer data. Cobanoglu, Berezina, Kasavana and Erdem (2011) reiterated that technology is a significant determinant of hotel guest satisfaction and for hotel selection. Kinyua (2012) added that improves human resource management since it increases the efficiency of
handling employee databases, communicating organization-wide, implementing training
programs and executing benefit and reward programs.

Despite the avalanche of findings on the positive effect of IT infrastructure on
performance and competitive advantage, this study found a significant but negative
correlation between IT infrastructure and competitive advantage. The hotels have
implemented all the industry-standard IT applications which run all the functionalities to
deliver operational efficiency; however, the study suggests that this alone is not the
source of their competitive advantage. In essence, incremental investment in IT resources
may not lead to competitive advantage, in the sense of increasing cost-efficiency, quality
service provision, faster delivery, operational flexibility, or profitability of the five star
hotels. It is also important to note that competitiveness does not merely arise from a
firm’s acquisition of IT resources. This is because other firms at the top of the industry
can also get these resources from the market. Competitive advantage arises from a firm’s
ability to create the right mix of complex, firm-specific and intangible resources and
abilities (Morabito, 2011). This has been echoed by other earlier researchers. Despite
many studies showing positive effects, due to IT imitation by competitors, ITs, have not,
in themselves, produced sustained competitive advantages (Powell & Dent-Micallef,
1997).

Ivanov and Webster (2017) report that the hospitality industry is embracing advanced
forms of IT such as robots, artificial intelligence and service automation (RAISA), as
manifested by chatbots, delivery robots, robot concierge, conveyor restaurants, self-
service information/check-out kiosks among others. However, the researchers note that
the costs and benefits of these technologies are still unclear, hence managers need to
critically evaluate and consider all factors before adopting new technologies, particularly
since acquisition costs, installation costs, maintenance costs, software update costs, costs
for hiring specialists and staff training costs, are often significant.

5.3.2. IT Competencies and Competitive Advantage

IT competencies allow an organization to exploit human resource capability to get
generate value from IT infrastructures. Competencies are varied and encompasses assets,
skills, knowledge, processes, and relationships that companies acquire, deploy, and
manage to improve innovativeness.
In this study, the finding showed that the managers had soft skills in basic computer operations such as Microsoft Office and Email, had the ability to identify, diagnose and correct technological problems, used IT to build relationships with stakeholders, process data and results for strategic decision-making, and were aware of security issues associated with using distributed IT systems. Additionally, they used routinely used IT for communication, negotiation and collaboration with workplace teams; were aware of significant trends in technological innovation that could affect the hotel industry; and understood the legal, ethical, cultural and societal issues related to the adoption and use of ICT.

Various researchers have reported a positive relationship between IT competencies and competitive advantage. Fernández-Mesa et al (2013) investigated the effect of internal and external learning competencies and found out that it drives innovation and competitive advantage. In the same vein, Pérez-Aróstegui et al (2013) reiterate that shows a positive and significant relationship between IT and quality management practices. Org and Ismael (2008) also showed that acquisition of IT knowledge, either through education or experience, has positive effects on competitive advantage among entrepreneurial firms. Gakenia (2015) reported that technology has a significant in explaining the variation of performance of firms, however, this study focused on telecommunication sector and not the hospitality sector.

IT tools are also crucial for management. In an integrated organization, IT competencies can be used to differentiate superior from inferior performances in the organization. This is because IT competencies encompass the personal characteristics, motives, attributes, and experiences of the employees (Boyatzis, 1982). This is the reason why IT has also become an indispensable part of human resource management, as it can be used to assess the skills, knowledge, behaviours, and capabilities needed by a specific job or project and aligns them with organizational strategies and priorities (Draganidis & Mentzas, 2006). Currently, it is causing the evolution of HRM from the traditional HR competencies that were common for administrative tasks to development of HR technologies and workforce analytics is helping to transform HR into a decision science with a measurable impact on business results. This has been seen in the adoption of HR applications (Lawler & Mohrman, 2003). For instance, electronic HRM (eHRM) applications allows for efficient management of employees in an increasingly technologically advanced workplace (Shirandula & Mwawaza, 2017).
These findings generally agree with the findings of this study, which demonstrated that IT competencies, ranging from the ability to perform basic computer operations, communicate and build virtual teams, customer relationship management, and data analysis, reporting, and forecasting, among other skills, positively influence competitive advantage. However, other studies such as Cakmak and Tas (2012) demonstrated that at the operational level, IT, creates technical and economic benefits, not strategic benefits, and found no evidence that IT created or maintained competitive advantage.

5.3.3. IT Integration and Competitive Advantage

IT integration relates to the match between IT infrastructure and IT competencies, in relation to how the physical, human, and organizational perspectives of a firm can be harnessed for greater efficiencies. Mwithiga and Njihia (2017) calls it the cooperative energy that has the potential to enhance the efficiency of business processes while Kim et al (2011) views it as the advancement and reconfiguration of IT to bolster business systems by creating linkages between the physical, human and organizational functionalities. This study looked at three aspects of IT integration, human resource (human), organizational processes and physical infrastructure. The findings indicated that, on human resource integration, nearly all the managers indicated that all the managerial personnel possess IT management capabilities necessary for maximum exploitation of IT resources and that the hotels had installed electronic human resource management (eHRM) application to manage human capital. In terms of organizational integration, a similar majority noted that the IT systems in the hotels linked all functional departments and external stakeholders such as suppliers. On physical integration, the managers were convinced that their hotels had the best IT system, which connected all branches. IT integration allowed the hotel to provide a wide variety of information to end users and share information seamlessly across the organization.

There are various studies that agree with the results reported about IT and competitive advantage among five star hotels in Nairobi. According to Bilghihan et al (2011) technology sophistication, management skills, and integration of resources are important components of business strategy and can lead to competitive advantage and result in lower costs, organizational agility, innovativeness, and enhanced customer satisfaction. In the same vein, Maiga, Nilsson and Ax (2015) demonstrated a significant association between information systems integration and cost and quality performance.
With regard to eHRM, Mishra and Akman (2010) add that adoption and integration of IT systems with organizational functions such as human resource management enhances efficiency and strengthens the capability of the strategic HR function to effectively managing employees in an increasingly technological oriented workplace. This agrees with Shirandula and Mwawaza (2017) that integration of basic technologies can help to streamline eprocesses and achieve operational efficiency in hotels.

On the contrary, Morabito (2010) found out in a survey of top managers that many firms are yet to merge information systems integration with the right complementary organizational resources. This weakness undermines the potential of IT creating competitive advantage because competitive advantage does not simply arise from replicable resources but from firm-specific and intangible resources and capabilities. Maiga (2015) reiterates that there are mixed results on the effect of IT integration.

5.4. Conclusions

5.4.1. IT Infrastructure and Competitive Advantage

This study concludes that five star hotels in Nairobi have acquired and implemented the basic IT infrastructure to manage business functions. The descriptive findings show that IT backbone is used for booking and reservations, front office operations, customer relationship management, restaurant management, financial management, business intelligence and analytics, warehouse and inventory management, and housekeeping. Despite this, IT was not a positive enabler of competitive advantage among the five star hotels included in the survey.

5.4.2. IT Competencies and Competitive Advantage

In the same vein, IT competencies were appreciated and developed by managers at the five star hotels. Managers had soft skills in basic computer operations such as Microsoft Office and Email; had the ability to identify, diagnose and correct technology problems; used IT to build relationships with stakeholders; used IT to process data and results for strategic decision-making; routinely used IT for communication, negotiation and collaboration with workplace teams; were aware of security issues associated with using distributed IT systems as well as the significant trends in technological innovation; and also understood the legal, ethical, cultural and societal issues related to the adoption and
use of ICT. The study found that IT competencies had a significant effect on competitive advantage.

5.4.3. IT Integration and Competitive Advantage

There were three levels of integration captured in the study: human resource integration, organizational integration and physical integration. The findings showed that possession of IT management capabilities allowed managers to fully exploit the potential of IT, for instance the use of eHRM to manage employees. A majority of the hotels had also achieved high levels of integration with regard to linking all functional departments, and finally physical integration allowed for connection of all the branches and enabling of seamless communication with both internal and external stakeholders. The regression results show that IT integration has a significant impact on competitive advantage.

5.5. Recommendations

5.5.1. Recommendations for Improvement

5.5.1.1. IT Infrastructure and Competitive Advantage

IT tools provide the backbone of operational processes for most modern organizations. In the hotel industry, the functionalities of reservations and room booking, front office operations, customer relationship management, housekeeping, restaurant management, warehouse and inventory management, financial management and business intelligence and analytics. Owing to the centrality of these processes, this study recommends continued update of IT systems to match the competition.

5.5.1.2. IT Competencies and Competitive Advantage

Human resource management is at the core of human-centred information management. It is human resources who utilize IT infrastructure to generate value for the company. The hotels should invest in improving IT competency through training programs so as to align IT investments with internal capabilities and organizational processes.

5.5.1.3. IT Integration and Competitive Advantage

The study shows that IT integration positively influences competitive advantage. This study recommends that hotels should integrate a well-organized IT integration strategy into its strategic decision processes to continually guide the seamless interaction between
managerial, human resource, financial, and customer service components for continued creation and generation of competitive advantage, and by extension, financial performance.

5.5.2. Recommendations for Further Studies

This study focused mainly on three dimensions of information technology: infrastructure, competencies, and integration. Further studies can examine other dimensions and establish associations with competitive advantage. The study only covers the hospitality industry. Due to the different ways in which technology is applied in productive activities, significant industry differences are expected. There is need for further research on other industries in the country. Finally, this study is grounded primarily on the resource-based theory hence it is limited in its interpretations. Other studies can adopt other theoretical approaches such as transaction cost theory to evaluate if there are variations within the hotel industry.
REFERENCES

ACM CCECC. (2014). *Information Technology Competency Model of Core Learning Outcomes and Assessment for Associate-Degree Curriculum*. The Association for Computing Machinery Committee for Computing Education in Community Colleges (ACM CCECC).


APPENDICES

Appendix 1: Survey Questionnaire

My name is Emmaculate Wanjiku Thuo, a student at United States University- Africa. I am pursuing Masters in Business Administration course. I wish to collect information from your organization that will assist me in my study project “Influence of Information Technology on competitive Advantage for Five Star Hotels in Nairobi County”. Kindly note, any information provided will be used for academic purposes only.

PART A: GENERAL INFORMATION

1. Gender: Male [ ] Female [ ]
2. What is your age?
   Under 20 years old [ ] 21- 30 years old [ ] 31-40 years old [ ]
   41-50 years old [ ] Over 51 years old [ ]
3. How long have you worked at the hotel?
   Less than 1 year [ ] Between 1-2 years [ ] Over 2-3 years [ ]
   Between 3-4 years [ ] 4 years and above
4. Level of Education
   Secondary [ ] Certificate/Diploma [ ] Degree [ ]
   Masters [ ] PhD [ ]
5. What is the number of beds in the hotel?
   Less than 50 [ ] 50 to 100 rooms [ ] 100 to 150 rooms
   150 to 200 rooms [ ] More than 200 rooms [ ]
6. How long has the hotel been operating?
   Less than 1 year [ ] 1 to 3 years [ ] 3 to 5 years [ ]
   5 to 7 years [ ] 7 years and above [ ]
7. When did the hotel get a 5-star classification? (state the year)
   Less than 1 year ago [ ] 1-2 years ago [ ] 2-3 years ago [ ]
   3-4 years ago [ ] More than 4 years ago
8. What is the total number of employees at the hotel
   Less than 50 employees [ ] 50-100 employees [ ] 100-150 employees [ ]
   150-200 employees [ ] More than 200 employees
PART B: IT INFRASTRUCTURE

9. To what extent does the hotel use the following information technology applications to perform the following tasks?

<table>
<thead>
<tr>
<th></th>
<th>Not at all</th>
<th>Less extent</th>
<th>Moderate extent</th>
<th>High extent</th>
<th>Very high extent</th>
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</thead>
<tbody>
<tr>
<td>a) Reservations and room booking</td>
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<td>b) Front office operations</td>
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<td>c) Customer relationship management</td>
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<td>d) Housekeeping</td>
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<td>e) Restaurant management</td>
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<td>f) Warehouse and inventory management</td>
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<td>g) Financial management (payroll, POS etc)</td>
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<td>h) Business intelligence and analytics</td>
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PART C: IT COMPETENCIES

10. To what extent do you agree with the following statements about your competency in using information technology solutions?

SD = Strongly Disagree  D = Disagree  U = Neutral  A = Agree  SA = Strongly Agree

<table>
<thead>
<tr>
<th></th>
<th>SD</th>
<th>D</th>
<th>N</th>
<th>A</th>
<th>SA</th>
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</thead>
<tbody>
<tr>
<td>a) I have skills in basic computer operations such as Microsoft Office and email</td>
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<td>b) I have the ability to identify, diagnose and correct technology problems</td>
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<td>c) I routinely use IT for communication, negotiation and collaboration with my team at the workplace</td>
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<td>d) I use IT systems to build relationships with customers and suppliers</td>
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<td>e) I can use technology tools to process data and report results to support decision making.</td>
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<td>f) I am aware of significant trends and emerging technologies that have an impact on the hotel industry</td>
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<td>g) I am aware of the security issues associated with using distributed IT systems</td>
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<td>h) I understand the legal, ethical, cultural, and societal issues related to technology.</td>
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PART D: IT INTEGRATION

11. To what extent do you agree with the following statements on information technology integration in your hotel?
SD = Strongly Disagree D = Disagree U = Neutral A = Agree SA = Strongly Agree

<table>
<thead>
<tr>
<th>Human resource integration</th>
<th>SD</th>
<th>D</th>
<th>N</th>
<th>A</th>
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<tbody>
<tr>
<td>a) All managerial personnel have the IT management capabilities to use our IT resources</td>
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<td>b) The hotel uses electronic human resource management (eHRM) to manage human resources</td>
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<thead>
<tr>
<th>Organizational integration</th>
<th>SD</th>
<th>D</th>
<th>N</th>
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<tbody>
<tr>
<td>c) Our IT systems links all departments at the hotel</td>
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<tr>
<td>d) Our IT systems links the hotel with external partners such as suppliers</td>
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<tr>
<th>Physical integration</th>
<th>SD</th>
<th>D</th>
<th>N</th>
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<tr>
<td>e) Compared to rivals within our industry, our organization has the best available IT systems and connections</td>
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<td>f) All our branches and mobile offices are connected to the central office</td>
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<td>g) Our organization offers a wide variety of information to end users</td>
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<td>h) Information is shared seamlessly across our organization, regardless of the location</td>
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PART E: COMPETITIVE ADVANTAGE

12. To what extent do you agree with the following statements?
SD = Strongly Disagree D = Disagree N = Neutral A = Agree SA = Strongly Agree

<table>
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<tr>
<th>Cost</th>
<th>SD</th>
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<tbody>
<tr>
<td>a) The hotel has reduced its production costs</td>
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<td>b) The hotel has increased labour productivity</td>
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<th>Quality</th>
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<tr>
<td>c) The hotel consistently offered high quality products/services</td>
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<td>d) The hotel has consistently conformed to industry standards of quality</td>
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<th>Delivery</th>
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<tr>
<td>e) The hotel delivers its goods/services in a timely manner</td>
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<td>f) The hotel meets its goods/services delivery promises to customers</td>
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<th>Flexibility</th>
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<tr>
<td>g) The hotel offers diverse goods and services</td>
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<td>h) The hotel is able to meet unpredictable fluctuations in demand for services/goods</td>
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<tr>
<th>Profitability</th>
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<tr>
<td>i) The hotel has consistently increased its sales volumes over the past three years</td>
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<td>j) The hotel has continued to grow its net profit over the past three years</td>
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Thank you