The Multipurpose Application of Radio Frequency Identification (RFID) in the Tourism Industry: On A Requirement Analysis for Employing RFID Technology in the Hotel Sector

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ABSTRACT

This study tried to evaluate the effects of Radio Frequency Identification **(** RFID) as the new and latest technological advancement towards the implementation of profit chain model (Heskett et al, 1997) on international tourists (inbound) in the case of North Cyprus. North Cyprus is blessed with natural endowments and proximity to tourist market, especially the European countries. It has numerous regional and geographical advantages for a full-blown tourism industry. The study has focused on a research that targeted international tourists in four and five star hotels with an aim to explore the level of expectations and satisfactions in a hypothetical situation implementation of RFID technology. The main assumption of the study is that FRID, if its diffusion is managed adequately, has the potential to enhance the satisfaction of the consumers of services and consequently their loyalty. The underlined factors that FRID is able to generate a positive outcomes are bill settlement, location, and self-check-in in line with profit chain model and eventual customer satisfaction, loyalty and organizational profitability. For the purpose of this research, 300 questionnaires were distributed to international tourists whom 250 returned as usable items. Out of the pool of nine hypotheses, eight hypotheses were supported. The result showed that the positive effects of RFID on customer's satisfaction and loyalty, which accompanied with increasing hotel profitability via hypothetical implementation of RFID.

Keywords: RFID technology, Profit Chain Model, customer satisfaction, North Cyprus.

ÖZ

Bu çalışmanın amacı; güncel teknolojik gelişmeler ışığında, yeni bir kâr zinciri modeli olan RFID'in KKTC'de turistler üzerindeki etkilerini değerlendirmektir. Kuzey Kıbrıs'ın sahip olduğu deniz, kum ve güneş gibi doğal güzelliklerin özellikle gelişmiş ülkelerden gelen turistler üzerindeki etkisi oldukça fazladır. Kıbrıs, turizme uygun coğrafik bir konuma sahip olması nedeniyle turizm endüstrisine çok uygun bir ülkedir. Bu çalışma, Kuzey Kıbrıs'taki dört ve beş yıldızlı otellerde RFID teknolojisinin uygulanmasına ilişkin yabancı turistlerin beklenti ve memnuniyet düzeyini belirlemeyi hedef almıştır. Ayrıca, bu çalışma RFID'nin yerleşim yerleri üzerindeki etkilerini, otelcilik sektöründeki müşteri memnuniyetini, ve kâr oranını vurgulamaktadır. Çalışmada uluslararası turistlere 300 adet anket dağıtılmış ve bunlardan 250 adeti değerlendirilebilir bulunmus ve bulgular neticesinde 8 hipotezden 7'si desteklenmiştir. Sonuç olarak çalışmanın RFID'nin gelişiminin yanısıra, müşteri memnuniyetle sadakatini bu hipotezler üzerinden olumlu olarak etkilendiği sonucuna ulaşılmıştır.

Anahtar Kelimeler : RFID teknolojisi , Kâr Zinciri Modeli , müşteri memnuniyeti , Kuzey Kıbrıs.

To My Family

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LIST OF ABBREVIATIONS

CRSs: PC Reservation Systems

IT: Information Technology

ICT: Information Communication Technology

IS: Information System

KKTC: Kuzey Kıbrıs Türk Cumhuriyet

PC: Personal Computer

RFID: Radio Frequency Identification

ROI: Return on Investment

SCC: Supply Chain Control

SCLM: Supply Chain Logistic Management

SCM: Supply Chain Management

SPSS: Statistical Package for the Social Sciences

TRNC: Turkish Republic of Northern Cyprus

Chapter 1

INTRODUCTION

Overview

In this chapter, brief information about the philosophy, purpose and methodology of the study will represent to give the general insight about the thesis framework and objectives.

1.1Philosophy

In a turbulent time, every organization, especially service organizations try to attract more new customers and retain them through enhancing the loyalty. Every organization seeks new strategic or technological advancement to overcome its competitors and obtain sustained competitive advantages. One of the most intelligent ways is to use new technological advancement and try to embed it with the organizational structure and function. Radio Frequency Identification (RFID) provides tags to distinguish the user from others in terms of location, bill settlement, and other usage (Shepard, 2005). RFID as the newest and hottest information tracing technology demonstrates the object information in anytime and anywhere. It provides the unique ID number related to the stuff and wireless communication between readers and tagged objects by using radio frequency waves to transfer data. Meanwhile, it has the ability to retrieve, store, and recall information concerning the particular item in the database. RFID assign special codes to the user or object so it can be easily understandable regardless of the time and location (Shepard, 2005). This new technology due to its wide range of usability and accessibility can provide

array of benefits for companies. Hospitality industry as one of the intense competing industry with high vulnerability faces with rapid fluctuation in its customer demands and request (Lee et al., 2008). Customers are more educated and aware from technological advancement and as a result will request better facilities against the required payment. So evaluating the effectiveness and efficiency of RFID as the newest and latest technology will open new possibilities for companies (Swedberg, 2010c).

In other words, Radio frequency identification can be used in tourism and hospitality industry for numerous applications in amplification marketing and operation to expand existence of new supply methods and improve service efficacy for customers (Lee et al., 2008; Gambon 2009). Radio-frequency identification (RFID) is a sort of competent automated technology which has been playing an increasingly important role by establishing intelligent system in the operation management, warehouse management system, and supply chain management. RFID is a complicated system and consists of wide variety of tourism industry including assess tracking, inventory control management systems, identification of part diversions, counterfeit protection, as well as faster retail checkout systems.

One of the most excessive and approved model in extant literature is profit chain model. This model describe the direct way from customer satisfaction to customer loyalty and then to organization profitability (Kim, 2014). Most of the studies apply this model in order to test the accuracy and acceptance of new independent variables. Customer satisfaction is the personal evaluation of the customers from products and services (Cohen & Olsen, 2013). When companies try to retain their customers by developing new tactics to expand satisfaction of their customers through meeting their

every expectation over the long period of time they will have pool of satisfied and loyal customers. Increase in customer satisfaction and loyalty means that customers will return to repeat their purchase. Repeating the purchase behavior directly increase the profitability and market performance of the company (Cohen & Olsen, 2013).Evaluating the effects of RFID as the newest and latest technological advancement through presenting profit chain model could give better insight to hotel managers for whether applying this new technology or not.

1.2 Problem Statement

Fluctuation in market demands enforce the organizations especially hospitality firms to find new ways to increase their profitability while achieving competitive advantages over their competitors. RFID as the new technology scarcely has been used by hospitality organizations in most of the developed and developing countries. So testing effectively of RFID via applying profit chain model will help the managers to have better insight and use this technology in a right way efficiently. Expanding and distinguishing the reliability of RFID as the new technology will reduce the managers doubts while overpass the customer's expectation. Most of the hotel managers fear from applying new technologies regarding the upcoming problems and difficulties and most importantly the associated costs. So this study will examine the reliability and efficiency of RFID model through profit chain model to reduce the doubt of the managers and supervisor ultimately.

1.3 Significance of the Study

This study tried to examine the relationship to test the applicability of RFID as the latest technological advancement through applying well known and excessive studied model called profit chain model. Although numerous studies examined the reliability of profit chain model to propose the way for hotel organization to stand out in the

hospitality industry but few studies consider technology as one the existing solution for service organization with high vulnerability rate (Kim, 2014; Karkkainen, 2007). Few studies developed the reliability of RFID to service environment (Heim, Wentworth, & Peng, 2009). Although RFID used as the marketing technology but no previous studies evaluated its effects on marketing issues. RFID as the efficient technology can help to improve the satisfaction of the customers and hotel managers as well but no previous studies consider this issue as the case (Hozak, 2012). So this study against the empirical backdrop, try to fill this gap and will provide useful contributions to marketing and hospitality industry as well.

1.4 Aim and Objectives

Based on aforementioned theoretical investigation, this study for the first time aim to evaluate the effects of RFID on three factors such as bill settlement, location accessibility, and self-check in on profit chain model while RFID play moderating role in this study. This study provides the efficient theoretical and statistical evaluation based on RFID to test its responsiveness on profit chain model. Testing its performance in hospitality market is one the main objective of this study next to presenting useful recommendation for hotel managers and supervisor to understand the extend of RFID technology. RFID can be used for inventory control, employee monitoring, monitor exact location of guests for special goals, tracking assets like, and also it can decrease the time of check in. There is a gap in the literature regarding RFID application as a technological device to facilitated and enhance customer satisfaction and loyalty which eventually were result in hotels successful business practice. There is not much studies on this particularly device and how can be utilized and if there are any study they have approached and mentioned the issue very briefly but this study is looking at this issue in a comprehensive way.

The aim of this study was to provide requirement analysis in order to explore potential of radio frequency identification in a hotel, and discover service weakness, which are invisible and underlying in the heart of hotel. Requirement analysis has the ability to damage service properties by justifying the nature of RFID technology in the tourism and hospitality industry. Requirement analysis can have been certifiable effects to figure some pitfalls and negative points out, and also find out some effective area, for cater favorable service in the tourism industry. In this study, requirement analysis employed to understand customers opinions based on available service, identify pitfalls and weakness that can leads to service failure, and also customer dissatisfaction through asking question about use radio frequency identification technology as an assists in order to enhancing guests comfort and convenience, and determine and offer new method, for provide new and affect customers experiences to managers and owners.

1.5 Methodology

This study evaluated the relationship between RFID and Profit chain model to demonstrate the responsiveness and effectively of it in competitive market environment. The aforementioned relationship tested through use of SPSS, Likert, Path analysis to examine the reliability and connectedness of the study variables in details. This study use deductive approach defined as using the accepted theory to examine the deduction and obtain the specific result based on the theory and approach (Hyde, 2000). This study distributed its data among international tourist from all over the world staying in four and five star hotels in North Cyprus.

1.6 Organization of the Study

The organization of the study is as followed. This chapter called Introduction as chapter one. Second chapter named literature review with detail information about the

study variables and their constructs. Third chapter called hypothesis development. Next one is methodology with including data analysis and data description. Fifth chapter named discussion and finding, in this chapter finding if the study and relevant outcomes discussed. The last chapter called conclusion with representing conclusion, implication for managers and limitation of study. At the end of the thesis referenced articles and books cited as well.

Chapter 2

LITERATURE REVIEW

Overview

This section will provide a review of IT and innovation in the tourism industry, so introduce Radio Frequency Identification and examine the role of the RFID in inventory control and supply. Also will states summary of service profit chain model.

2.1 IT and Innovation in Tourism Industry

Tourism and hospitality industry is mixture of several industries and knowledge, so it reaction to changing in environment and sciences. Although information technology and innovation in the tourism have more impact (positive and negative), but clever manager can used of information technology and innovation to convert strengths and opportunity. Technological advance change the nature of tourism industry, for instance it could old reservation shift to online reservation, which it make easier, quicker, cheaper, and accurate reservation for both of them customers and provider services. Information technology can decrease costs, raise operation yield and service quality.

Technological progress and tourism have been going hand in hand for years (Poon, 1993; Sheldon, 1997). Since the 1980s, Information Communication Technologies (ICTs) have been transforming tourism globally. Advancements in ICTs have undoubtedly changed business practices and systems and also industry structures (Porter, 2001). The institution of the pc Reservation Systems (CRSs) within the

Seventies and world Distribution Systems (GDSs) within the late Nineteen Eighties, followed by the event of the web within the late Nineteen Nineties, have reworked the most effective operational and strategic practices within the trade dramatically (Buhalis, 2003; eBusinessW@tch, 2006; Emmer, Tauck, Wilkinson, & Moore, 1993;O'Connor, 1999). If the past twenty years have visually perceived accentuate on technology as such, then since the year 2000 we've been witnessing the genuinely transformational impact of the communications technologies. This has given scope for the event of an immensely colossal varied of latest implements and accommodations that facilitate world interaction between players round the world. Tourism as a global business and because the biggest supplier of jobs on the earth boasts a larger array of heterogeneous stakeholders than several alternative industries, The energetic growth and development of the business area unit maybe solely reflected by the expansion of ICTs. Increasingly, ICTs play a vital role for the aggressiveness of business enterprise organizations and destinations also as for the complete trade as an entire (UNWTO, 2001). Advancements in web indexes convey limit and speed of systems have affected the amount of travelers far and wide that utilize advances for arranging and encountering their ventures.

Not only ICTs empower consumers to identify, customize and purchase tourism products but they also support the globalization of the industry by providing effective tools for suppliers to develop, manage, and distribute their offerings worldwide (Buhalis, 1998). As a result, a major research field is emerging from this interface, as the researchers increasingly seek to understand and communicate the significance of the new technologies, investigate and interpret contemporary activity, and attempt to forecast the way ahead for both industry and technological developments.

2.1.1 Consumers and Demand Dimensions

Increasingly, ICTs enable travelers to access reliable and accurate information as well as to undertake reservations in a fraction of time, cost and inconvenience required by conventional methods (O'Connor, 1999). ICTs can assist in the improvement of the service quality and contribute to higher guest/traveler satisfaction. ICTs put clients amidst its purpose and item delivery. Every tourist is distinctive; convey a remarkable mix of encounters, causes, and goals. To a degree the new complex traveler has developed as a consequence of experience. Tourists from the real creating areas of the planet have ended up incessant travelers, are phonetically and mechanically gifted and can capacity in multicultural and requesting situations abroad. The development of ICTs and particularly the Internet empowered the ''new'' tourist who is becoming knowledgeable and is seeking exceptional value for money and time.

Travel and holidays are one of the most expensive items purchased regularly by households around the world, and it represents a significant proportion of individual's annual budget. The Internet has changed tourism consumer behavior dramatically (Mills & Law, 2004). Prospective travelers have direct access to a much greater wealth of information provided by tourism organizations, private enterprises and increasingly by other users/consumers. From information search, to destination/product consumption and post experience engagement, ICTs offer a range of tools to facilitate and improve the process. Customers search for travel-related information, make online air-ticket bookings, online room reservations, and other online purchases themselves instead of relying on travel agencies to undertake this process for them(Morrison, Jing, O'Leary, & Lipping, 2001). Due to the popularity of Internet applications, most tourism organizations such as hotels, airlines, and travel

agencies have embraced Internet technologies as part of their marketing and communication strategies.

Information Search is a significant part of the purchase decision process and was revolutionized as a result of the Internet. ICTs not only reduce uncertainty and perceived risks but also enhance the quality of trips (Fodness &Murray, 1997).

The more research undertaken on a trip and the more information found, the better customer needs can be met and served. A well-informed consumer is able to interact better with local resources and cultures, to find products and services that meet his/her requirements and to take advantage of special offers and reduced prices. According to Snepenger, Meged, Snelling, and Worrall (1990), the four major factors that influence information search in the tourism context are (i) the composition of vacation groups, (ii) the presence of families and friends at the destination, (iii) prior visits to the destination, and (iv) the degree of novelty associated with the destination. Moreover, Jang (2004) proposed that future research should explore potential travelers' concerns and difficulties when planning and purchasing trips online, which can be achieved through in-depth analysis of relationships regarding information search and cross-cultural impacts on tourists' online information search behaviors. Buhalis (1998) stated that potential tourists have become more independent and sophisticated on using a wide range of tools to arrange for their trips. These include reservation systems and online travel agencies (such as Expedia), search engines and meta-search engines (such as Google and Kayak, respectively), destination management systems (such as visitbritain.com), social networking and web 2.0 portals (such as wayn and trip advisor), price comparison sites (such as kelkoo) as well as individual suppliers and intermediaries sites. This, in turn, enables consumers to find offers that meet their

needs and tastes (Bakos, 1997, 1998). The Internet is one of the most influential technologies that have changed travelers' behavior. Previous research showed that tourists who searched on the Internet tended to spend more at their destinations as compared to those who consult other information sources (Bonn, Furr, & Susskind, 1998; Luo, Feng, & Cai, 2004). The Internet enables patrons to take on directly with suppliers and testing the role of mediators. It also allowed consumers to act together dynamically with suppliers and destination and frequently create requests that will allow them to customize their products. There is a large increase in the quantity of customers make reservations straight from hotel websites (Jeong, Oh, & Gregoire, 2003). As a result, reply actions becomes an important issue for the success of small and medium-sized tourism enterprises (Main, 2001; Pechlaner, Rienzner,Matzler, & Osti, 2002). In addition, pleasure online has a helpful impact on loyalty both to the organizational programmed and their website (Anderson & Srinivansan,2003). Wolfe, Hsu, and Kang's (2004) research, the reason of consumers not purchase travel products online are the be short of own service, safety issues, lack of skill, and time consuming.

Weber and Roehl (1999)found that people purchasing travel products online are more likely to have been online for 4 years or more and trust can be built between customers and online businesses through positive experience of past transactions (Bai, Hu, Elsworth, & Countryman, 2004; Bieger, Beritelli, Weinert, & Wittmer, 2005). The Internet is by now influence the buyer actions in upward country such as China enable clients to have much more option (Li & Buhalis, 2005).

Increasingly consumers are willing to provide significant personal information in exchange for recognition and better services. Tourism organizations should also

collect customer information at each stage of service, before, during, and after a visit in order to understand behavior choices, concerns, and determinants. Customer satisfaction depends highly on the accuracy and comprehensiveness of specific tourism information and the ability of organizations to react instantly to consumer requests. Personalized services determined by higher Customer Relationship Management systems should proof buyer preferences and necessities for here and future custom (Picolli, O'Connor, Capaccioli, & Alvarez, 2003). Systems require being site, context, and frame of mind aware in order to provide shrewd counsel.

2.1.2 Technological Innovation

Constant innovation in applications of hardware, software, and network developments means that only dynamic organizations, which can assess the requirements of their stakeholders and respond efficiently and effectively, will be able to outperform their competitors and maintain their long-term prosperity. Rapid technological development paradoxically means that the more powerful and complex the ICTs become, the more affordable, user-friendly they become, enabling more people and organizations to take advantage. Technological innovations in hardware, software, and Netware have been propelling a wide range of changes in Information Systems (IS). ICTs convergence effectively integrates the entire range of hardware, software, groupware, Netware, and human ware and blurs the boundaries between equipment and software (Werthner &Klein, 1999).

Wireless and mobile networks are extensively used for communications, networking of equipment, and interoperability between both organizations and functions. As a result, IS have evolved from simply interrelated components working together to collect, process, store and disseminate information to support decision-making,

coordination, control, analysis and visualization in an organization, to dynamic, interoperable mechanisms of collecting, processing and disseminating intelligence within organizations and in their extensive environment (Laudon& Laudon, 2007; Turban & Aronson, 2001). Technology therefore emerges as an ‘‘info-structure’’ of an organization that supports the entire range of internal and external communications and processes (Buhalis, 2003). ICTs are becoming a holistic integrated system of networked equipment and software, which enables effective data processing and communication for organizational benefit.

Interoperability and Ontology building knowledge base is one of these technologies. Werthner and Klein (1999) clear interoperability as the prerequisite of a well-defined and end-to-end service which is in a consistent and conventional mode. This usually covers not just technical skin but also in the case of electronic bazaar environment, contractual skin texture and a set of institutional system. Stabb and Werthner (2002) avowed that interoperability is a main technical problem. Also, Maedche and Staab (2002, 2003) show that semantic web technologies can be used for tourism IS to supply of use data on text and shape, on top of generate a semantic description. The OntoMat-Service, introduced by Agarwal, Handschuh, and Staab (2003), can embed the process of web service discovery. Ravellers thus no longer need to search information among millions of websites to grab the desire information. To the degree that tourism organizations need to interact dynamically with partners to develop and deliver tourism products, interoperability will be critical for their ability to work efficiently with others.

Multimedia is also becoming one of key areas of development that influences tourism. Tourism information needs an extensive representation of photos and graphics in

order to provide a tangible image or experience to travel planners. Using animations or other media technology like software of animation directorially can enhance information wealth and interaction. In the media technology it has two kind of technology effect to the truism industry (Cho & Fesenmaier, 2001). The 3D interactive websites have been adopted by online marketers to attract online consumers, encourage online purchases, and to create loyalty (Fiore, Kim, & Lee, 2005). Tourists can get visualized tourism information from digital maps with aerial and satellite images in both two dimensions and even three dimensions (Raggam & Almer, 2005). There are a number of research domains or components in which significant progress must be made in order to further develop and realise the AI vision (Buhalis & O'Connor, 2005).

2.2 Radio Frequency Identification

RFID is the leading technology in automatic identification and data collection. Radio Frequency Identification technology (RFID) was first discovered in 1935 during the second World War (Anir et al., 2008). According to (Chao et al., 2007) RFID is "one of the ten greatest causal and contributory technologies of the 21st century". This technology is believed to be one of the most promising automated tracking enablers, that has a great influence on logistics and supply chain management (SCLM) (El Ghazali et al., 2011).

Radio frequency identification (RFID) is new technology that applying in kind of sectors increasingly like supply chain, retail, distribute, health care. In fact RFID provide real time information about products, customers and inventories. Radio frequency identification is a public term for technologies that use radio waves to automatically identify people or objects.RFID is an area of automatic identification

that is gaining momentum and is considered by some to emerge as one of the most pervasive computing technologies in history (Roberts, Radio frequency identification (RFID), 2006). RFID technology enables the real time to asset tracking in the supply chain and warehouse management. As an illustration, in tracking assets in the value chain, RFID is capable of providing real-time visibility induced to cost saving and enhancing efficiency with delivering process between multiple nodes by automated identification numbers. RFID system can apply in management control in order to enhance the quality and management level of service efficiency.

As mentioned in introduction section briefly; RFID system is a set of tags, readers with antennas and a software application that works as a middleware and a driver for the server computer. Tags are usually stationary and are connected to equipment or a component. Each tag will have a unique ID which is recognizable to every member involved in the component`s supply chain. The RFID technology has most notably been identified as a tool that has the capability of increasing the visibility of materials in a supply chin context (Angeles, 2005). Radio frequency identification is kind of recognizing data by radio waves. It is way for hoarding and remotely regains information using systems called RFID tags or transponders (Feng, 2011). RFID technology uses short-range wireless communication in radio frequency (RF) band to transmit data to readers from inexpensive and disposable tags (microchips) and it automatically identifies objects or people with RFID tags several inches to several yard away (Collins, 2010). RFID technology allows hospitality organizations to collect real-time date about their customers that helps them to customize their service (Ozturk, Palakurthi, & Hancer, 2012).

The main role of this system is to gather the information of the tags even if they are not the within the line-of-sight by sending radio waves to the tags (Chon et al., 2004). Readers can read and find tags that are within their range of detection of their antennas.is a simple and overall illustration of a typical RFID system.

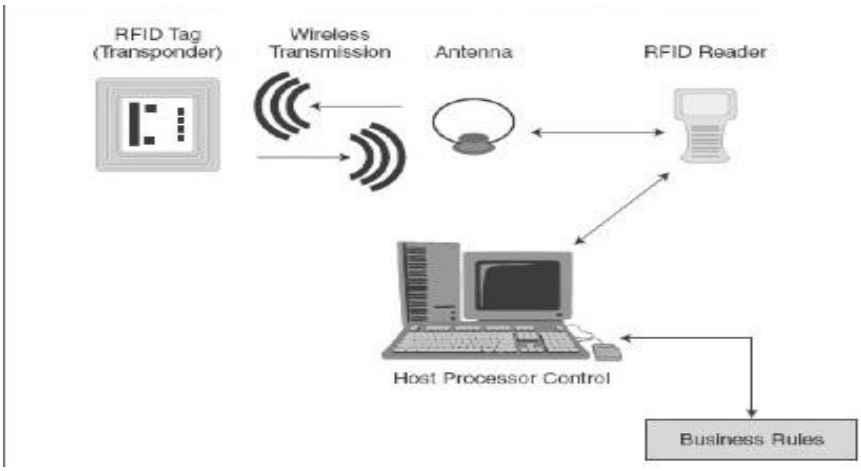

Figure Simple RFID Illustration

Radio frequency identification (RFID) is the generic name for technologies that use radio waves to automatically identify individual items, also RFID have several components which consist of reader, tag, antenna, and chip (Bottani & Rizzi, 2008). RFID is one application that provides a system for increase ability of manager to controlling assets and materials (Lee, Fiedler, & Smith, 2008),Radio frequency identification compound of various portion, those called tag, antenna, and reader.

2.1.1 Tag

An RFID tags regularly involve a circuit OF memory and also has essential microprocessor chip. Because every data and information reserve in the tag, that is main components of radio frequency identification. Objectives store in memory of tag, it is accessible with radio frequency to reader.

The 3rd layer of the system corresponds to the middleware and it is located on the computer that contains the host software which translates the reader's signal for the user interface (El Ghazali et al., 2011).RFID technology wireless non-contact communication system used radio wave to tacking of the information .this system work according radio wave characteristic.

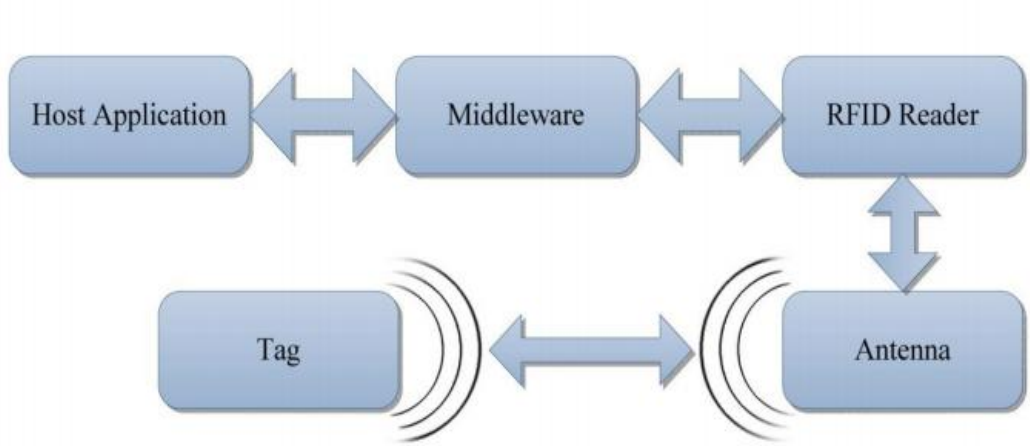

Figure 2 RFID working process

Passive Tags:

- No internal power supply
- Mostly read only (data cannot be re-written)
- Unlimited life
- Usually smaller/lighter than active tags
- Generally cheaper than active tags
- Limited read range

- Less data storage capability than active tags.

Active tags:

- Contains internal power supply (battery)
- usually read/write (data can either be fixed or changed)
- Limited life (can be up to about 10 years)
- Usually larger/heavier than passive tags
- Generally more expensive than passive tags
- Longer reading range than passive tags
- They have more storage space on them comparing to passive ones

Active RFID tags perform at 433MHz, 2.45 GHz or 5.8 GHz frequency and they have a reading range of 60 feet to 300 feet. This longer reading range is the main reason that active tags are more expensive. Semi-passive tags are also powered by battery but the power will be used to emit the radio waves only when the reader comes within a tag's reading vicinity. On the other hand passive RFID tags perform at low frequencies (124 kHz, 125 kHz or 135 kHz), high frequency (13.56 MHz) and ultra-high frequency (ranging from 400 MHz to 960 MHz). Hence they have a minus reading range relatively and up to 30 feet. Because of this less reading range and the fact that they require less maintenance, Passive tags are less expensive when compared with the other tag types since (Institute, 2006). Depending upon the

memory capacity the tags are also categorized into read only, write-once read-many, and read-write (Meadati et al., 2010).

Are few pictures of different RFID tags and shows that these tags can come in so many different shapes currently the passive RFID tags are utilized with a limited storage space that can contain permanent information of its corresponding component.

Generic Band Name	Frequency Range	Comment
Low Frequency (LF)	120 - 135 kHz	Short range inductive applications.
High Frequency (HF)	13.56 MHz	Worldwide common frequency, smart cards and labels.
Ultra High Frequency (UHF)	433 MHz	Active low power tags.
	860 - 960 MHz	Band with major supply chain development activity.
Microwave	2450 MHz	Active tag technology gives range and fast data rates.

Figure 3 Different type tags frequency wave

Figure 4 Different model tags

2.2.2 RFID Antennas

Transmission data between RFID tags and the reader is performed by the antenna which is displayed in Figure 5. As it was mentioned earlier, the range of frequency for passive tags which has to be tracked is limited. Since they are activated, all information about the tags can be transferred to the reader via antenna (O. Shoewu and O. Badejo, 2006). Furthermore, it is capable to update required information which is sent from the reader to the tags and data can be rewritten on the tags through antenna.

Figure 5 RFID antenna

2.2.3 RFID Reader

The basic component of RFID system is the interrogator or reader. It reads the certain amount of data from the tags which is received by antenna and writes data to the compatible tags (W. P. Liao, T. M. Lin and S. H. Liao, 2008). RFID readers are classified according to type of application. Handheld readers enable implementers to access items at different positions of work and track required tagged objects by a wireless communication. Furthermore, they are ideal devices used for asset tracking in the supply chain management or other areas. Portal readers are great devices to be applied in various applications that wide range of frequency is going to be recognized and

provide several ports where RFID antennas can be connected. For instance, 8-Port Gen 2 RFID reader supports up to 8 inputs and outputs for 4 pairs antenna(GAO RFID, 2012). Fixed readers are adequate for objects traceability through dock doors, conveyors, and etc. RFID readers' modules in small size were designed to be inserted in the products in the manufacturing area. Figure 6 shows various sorts of RFID readers used in different applications.

Figure 6 RFID readers

2.3 RFID in Inventory Control

In recent years, a new inventory tracking technology has been introduced in the marketplace. This is the technology of Radio frequency identification or RFID in short. (zhu, Mukhopadhyay, & Kurata, 2012). Inventory management is the process of efficiently overseeing the constant flow of units into and out of an existing inventory.

This process usually involves controlling the transfer in of units in order to prevent the inventory from becoming too high, or dwindling to levels that could put the operation of the company into jeopardy. Competent inventory management also seeks to control the costs associated with the inventory, both from the perspective of the total value of the goods included and the tax burden generated by the cumulative value of the inventory. The application of RFID in warehouse, conduct the systems have been exact track of goods and equipment, which located in the stock. With utilizing RFID system senior manager has accurate control over warehouse, so can gives a better service with real data. Also with applying this technique possibility of theft and lost objectives reduced. RFID technology allows companies design new methods for immediate access, to real location and real amount of goods and objectives in the real time.

In the supply chain management inaccuracy problem is important, for improving this problem many companies used automated inventory system and information system, inventory levels in information systems and the real physical inventory levels often do not match(Y. Kang and S.B. Gershwin, 2004). Inaccuracy is the difference between these inventory levels and this difference is effect on the performance of firms. According to DeHoratius and Raman (N. DeHoratius and A. Raman, 2008) 65% of the inventory records in retail stores were inaccurate. The result of this paper by obtained in a case study by investigative about 370,000 inventory records from 37 stores of an important retailer (Gamma).There are so numerous papers in the overview that have considered the impact of inventory inaccuracy and its causes. the paper of Ingle hart and Morey(D.L. Iglehart and R.C. Morey, 1972) is one of this kind of papers according to this paper can be find Table 2 represents a survey on the

different causes of inventory inaccuracy. We divided in four groups namely: transaction errors, shrinkage errors, inaccessible inventory and supply errors. Ingle hart and Morey introduced transaction errors in the inventory management and also several authors followed this study (Krajewski et al.2012). Transaction errors include shipment errors, delivery errors, scanning errors and also incorrect identification of items (Y. M. Lee, 2005).shipping errors can be very expensive; customers who receive wrong items can demand a refund or the supplier has to pay double transportation costs (A. Raman, 2000)problem of delivers is proposed by H. Lee and O. Ozer (Y. M. Lee, F. Cheng, and Y. T. Leung, 2005)according to literate of this thesis we found all of existing problems of inventory management system and we categorize in the Table by how is she/he proposed. Consider that RFID cannot improve or destroy this entire problem but it can be improve some of this problem to consider capability of RFID system like real time monitoring and real time data collected.

2.3.1 Definitions:

Transaction errors: Transaction errors include shipment errors, delivery errors, scanning errors and also incorrect identification of items. Shipping errors can be very expensive; customers who receive wrong items can demand a refund or the supplier has to pay double transportation costs.

Shipment errors: Shipping errors can be very expensive; customers who receive wrong items can demand a refund or the supplier has to pay double transportation costs.

Delivery errors: Delivery errors were explained such as delivery quantities from suppliers that are different than the required quantities (H. Lee and O. Ozer, 2005) the deliveries of wrong products or deliveries to the wrong directions are also delivery errors (K. Alexander, T. Gilliam , 2002).

Scanning errors: this error occur when customer want to buy two similar part with some price.

Shrinkage (named also stock loss) errors: include all types of errors that cause loss of products ready for sale. According to University of Florida, shrinkage errors represent 1.69% of sales for retailers (R.C. Hollinger and J.L. Davis, 2001).

	Transaction errors	Shipment errors	Delivery errors	Scanning errors	Incorrect identification	Shrinkage errors	Theft	Unavailable for sale	Vendor fraud	Administrative errors	Inaccessible inventory	Misplacement	Supply errors
Inglehart and Morey [49]	*												
Bullard and Resnik [18]						*	*						
Krajewski *et al.* [61]	*		*										
Brooks *et al.* [15]	*		*	*		*	*						
Yano and Lee [119]													*
Raman [84]	*	*		*									
Lightburn [71]						*		*					
Alexander *et al.* [3] [4]	*	*	*	*		*	*	*					*
Kang and Koh [53]						*							
Chappell *et al.* [22] [21]											*	*	
Kok and Shang [59]	*												
DeHoratius and Raman [26]	*	*		*							*	*	
Wong and McFarlane [117]	*		*			*	*				*	*	
Tellkamp *et al.* [103]	*			*		*	*		*	*			
Lee *et al.* [66]	*				*	*					*		
Kang and Gershwin [52]	*				*	*	*						
Fleisch and Tellkamp [32]	*		*			*	*	*			*	*	
Kleijnen and Van Der Vorst [58]						*							
Sahin [90]	*					*	*	*			*	*	
Lee and Ozer [65]	*		*	*		*	*	*	*		*	*	
Bensoussan *et al.* [12]						*		*					*
Camdereli and Swaminathan [19]											*	*	
Atali *et al.* [6]	*			*		*	*	*			*	*	
De Kok *et al.* [60]	*					*					*	*	
Ketzenberg and Ferguson [54]						*		*					
Rekik *et al.* [85] [87] [88] [86]	*	*		*		*	*	*		*	*	*	*
Tellkamp [104]	*	*	*	*		*	*	*	*	*	*	*	
Basinger [11]	*	*		*	*	*	*	*	*		*	*	
Doerr *et al.* [28]	*	*				*							
Kim *et al.* [57]						*							
Tajima [102]						*	*	*					
Leung *et al.* [69]	*		*		*	*	*	*			*		
Delaunay *et al.* [27]	*					*						*	*
Uçkun *et al.* [108] [107]	*					*						*	
Sarac *et al.* [92] [93]						*	*	*				*	

Figure 7 Survey on the causes of inventory inaccuracy

Inaccessible inventory can be explained as products which are not in the correct place and are not available for customers. Inaccessible inventories, called also misplaced items, have been studied by many authors these errors are effective directory to the inventory management and lose the productivity, efficiency and robustness of the inventory management .finding best system to improve of this errors, on the other hand improve and increasing the productivity of the inventory management via using of new technology .one of this technology is RFID technology. Today this technology is common method to implementation to inventory to arriving of gold. (Delaunay et al, 2007).

2.4 RFID in Supply Chain

In two decades years the use of radio frequency identification become popular in supply chain, and it had significant growth in this portion. RFID system emerges as a new technology, which exchange the ways of warehousing, in basic it broke old model of tracking the location of equipment and manually count items. Radio frequency identification created massive transformation in supply chain management, so that today less success companies are seen, which don't utilizations RFID system in their business.

RFID technology can bring a wide range of applicable benefits towards numerous industries such as construction, manufacturing, retail, agriculture, healthcare, logistics, aerospace, packaging, transportation, and many others (El Ghazali et al., 2011). This shows how this technology can spread along the supply chain and benefit the whole industry by providing tracking capability for every firm involved in the supply chain.

Supply chain management (SCM) is managing the transactions along the supply chain from sourcing raw materials to final delivery to the consumer. SCM focuses on minimizing the time consumption of operate each transaction, eliminating waste and optimizing response by amplifying profitability (Handfield and Nichols, 1999). (Tserng and Lin, 2002) Developed an accelerated subcontracting and procuring and referred to it as "ASAP" model for construction supply chain management by amalgamating the "quick response mechanism of information technology". In this approach just like other supply chain integration firms does not merely care about their internal processes and they work as a whole together to get the best result.In order accumulate accurate information and real data in the management of internal production used of radio frequency identification. This technology allows companies that increase their management efficiency, on the other hand decrease and cut lot cost. Controlling supply chain would become necessary as a consequential aspect of SCM referred to supply chain control (SCC). SCC in construction generally contains a set of involved firms and individuals performing collaboratively in a network of internally related processes or activities which are aimed to effectively satisfy the final customer needs while it is also beneficial to all members of the supply chain (Arbulu and Tommelein, 2002). Controlling the construction supply chain needs information sharing environment and dynamic real-time control (Wang et al., 2007).Information sharing environment could be enabled through data flow capabilities of cloud system which according to aforementioned liabilities, can tremendously aid the supply chain with its data exchange processes. Dynamic real-time control could become available by using RFID technology to track assets and resources throughout the construction supply chain. So by using RFID and cloud computing system in construction industry, its supply chain could become more

integrated and more robust, hence its processes would become more just in time and just enough which means less wasted time and resource.

The intention usage of RFID technology in the supply chain management is controlling total system as well as enhancing customer service level in the case, concerning the use of RFID technology in construction site, (Atkinson, 2004, Furlani and Pfeffer, 2000, Jaselskis and El-Misalami, 2003, Song et al., 2006) concentrated on material and resource tracking in construction environment. It seems that using RFID alone does not satisfy the construction management requirement, due to ongoing additional studies which are being done by the researchers to improve the subject. Accordingly (Bulusu et al., 2000), (Ergen and Akinci, 2007) and (Andoh et al., 2012) studied the feasibility of using RFID and GPS together. (Boukamp and Ergen, 2008) carried out a study about component identification and proposed an architecture system to support the construction site, also (Elghamrawy et al., 2009) presented a semi-automatic framework for data storing and retrieval to aid the constructor on construction site. Several closer and more related studies have been carried out; (Wang et al., 2007) proposed a systematic RFID-Based supply chain control which uses a central on-line network to share the information through involved organizations. (Xie et al., 2010). They have also applied a stationary reading system to monitor status in high-rise renovation project (Costin et al., 2012b) which the same approach had been used in stationary reading segment in this study.(a.v.barenji et al,2013) proposed a system to control of micro control to improving of control system in the manufacturing facility . RFID technologies have gained sign cant interest from supply chain industries and academics in recent years, However, RFID is not a new technology. According to AIM1, the rest applications marked during the Second

World War were created to dierentiate friendly planes from enemy planes (IFF System, Identification Friend or Foe). RFID technologies have made advance through the recent development this development contained IT technology. The components of RFID technology becoming smaller and smaller, with this changing the used of RFID technology in the supply chains are increased. Bagchi et al. Reported the prediction of RFID growth as from $1 billion in 2003 to $4 billion in 2008 to $20 billion in 2013.

Publications	Main Approaches	Main Topics
Practical papers	Pilot projects	Inventory management
	Case studies	Logistics and Transportation
	ROI analyzes	Assembly and Manufacturing
		Asset tracking and Object location
		Environment sensors
Academic papers	Analytical approach	Inventory inaccuracy
	Simulation approach	Bullwhip effect
	ROI analyzes	Replenishment policies
	Literature review	

Figure 8 Classification of publications

The literature on RFID technology in the supply chains demonstrate the application is new and can be divided according publication at this filed in the two groups :practical paper(white papers, technical reports) and academic papers. Down table shows the main classification of papers according to these topics of the publication on this technology at supply chains (G. Barbier and J. C. Lecosse, 2007).

Practical papers generally deal with pilot projects, case studies and ROI analyzes of RFID implementations in supply chains. Companies deploy pilot projects to test this new technology in a small and simple environment to observe the difficulties and the

efficiencies of its integration, to analyze the associated costs and ports and to facilitate the complete integration in the whole company if they decide to implement it (Y. Rekik, 2006).

2.4.1 Prospective Benefits of RFID Technologies in Supply Chains

Using of RFID technology offer several contribution to the supply chain with taking advantage of RFID technologies likes unique identification of products , and easy communications ,real time information ,real time monitoring productions and RFID can improve the traceability of products and the visibility throughout the supply chain (Y.V. Joshi , 2000)and also with using of RFID technology can be more reliable of information from counting process and also improve inventory flows and more accurate information(Chow et al., Tajima. Leung et al, 2007) present the benefits of RFID as in Figure 6 in three main groups: revenue, operating margin, capital efficiency.

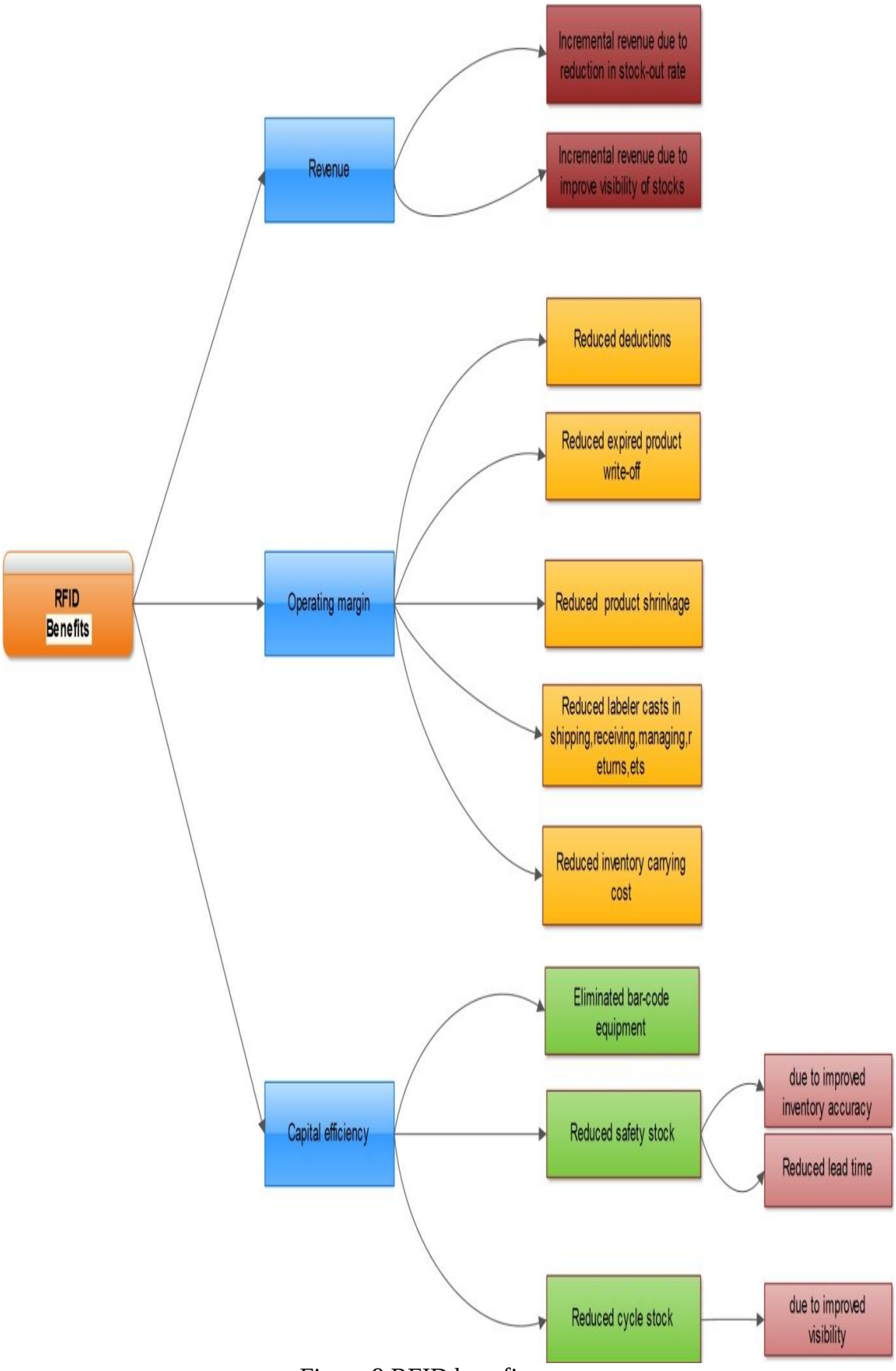

Figure 9 RFID benefits tree

However, as mentioned before, the RFID technology implementation is not just to improve current systems. Retrofitting process using this new technology can also lead to large gains in the overall supply chain effectiveness (McFarlane et al, 2003).

There are not many real supply chain application yet at this technology ,the application on RFID technology in the supply chain increasing by 12 percentage of 2001 until 2003. Wal-Mart provided a considerable acceleration to RFID implementations in supply chains. According to the analysis of the University of Arkansas, Wal-Mart succeeded in adopting the RFID technology and reduced out of-stocks by 16% (E. Bottani and A. Rizzi, 2008. Roberti, 2003) shows that out-of-stock items with RFID were replenished three times faster than items using standard barcode technology.

2.5 The Service-Profit Chain

The service-profit chain establishes relationships between profitability, customer loyalty, and employee satisfaction, loyalty, and productivity. The links in the chain (which should be regarded as propositions) are as follows: Profit and growth are stimulated primarily by customer loyalty. Loyalty is a direct result of customer satisfaction. Satisfaction is largely influenced by the value of services provided to customers. Value is created by satisfied, loyal, and productive employees. Employee satisfaction, in turn, results primarily from high-quality support services and policies that enable employees to deliver results to customers. (See the exhibit “The Links in the Service-Profit Chain (Gelade & Young, 2005).

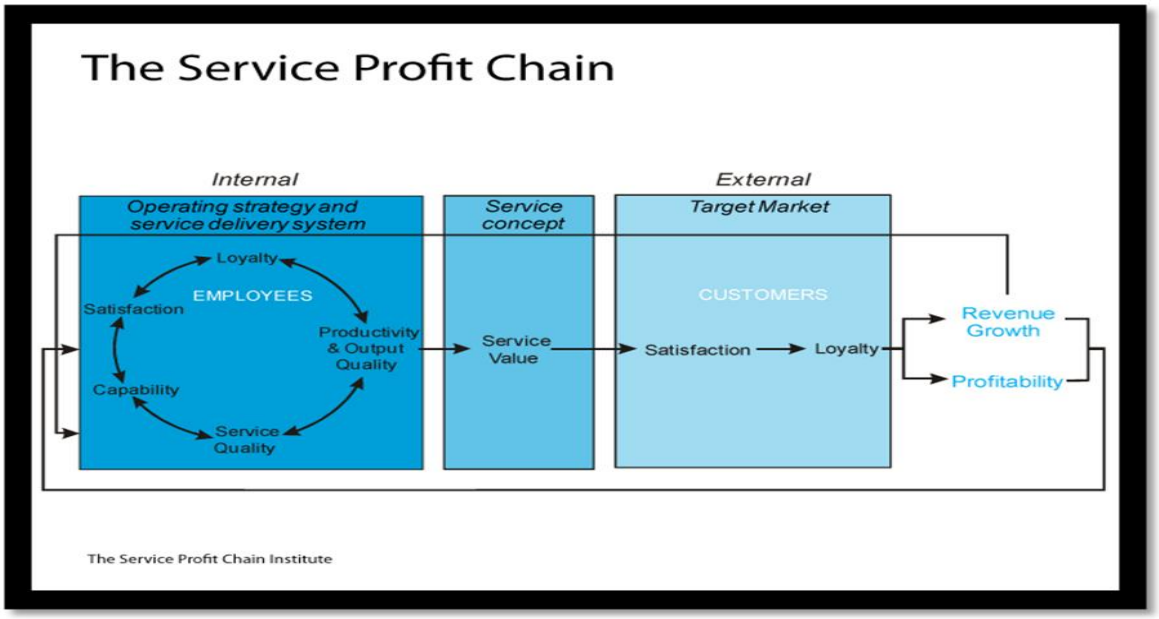

Figure 10 Profit Chain Model

One plausible account of the link between the employee's work experiences and financial performance holds that, in the service sector, customer satisfaction is a critical intervening variable. Management theorists call this view of organizational performance the service profit chain (Heskett et al., 1997). Stated simply, the service profit chain asserts that satisfied and motivated employees produce satisfied customers and satisfied customers tend to purchase more, increasing the revenue and profits of the organization. Heskettet al. (1997), for example, define the service profit chain as 'involving direct and strong relationships between profit; growth; customer loyalty; customer satisfaction; the value of goods and services delivered to customers; and employee capability, satisfaction, loyalty and productivity. In the retail sector, perceptions of a strong service climate have been linked to enhanced store financial performance (Borucki & Burke, 1999), and positive job-related attitudes to increased sales (Leung, 1997), and to revenue growth (Rucci, Kirn, & Quinn, 1998). In addition, George and Bettenhausen (1990) found links between the positive mood of store managers and sales volume. To date, the largest study of employee perceptions and

business unit performance is a meta-analysis of 7,939 work units in 36 companies, conducted by Harter, Schmidt, and Hayes (2002).

The association between customer satisfaction and customer loyalty is one of the most essential relationships for marketing theory and practice, because loyalty impacts firms' financial performance and value. Also, the association between customer satisfaction and customer loyalty links customer attitudes (e.g., how much customers are satisfied with firms' product or service) to customer behavior (e.g., customers' actual repurchase behavior for the product or service) (Edvardsson, et al., 2000).In the another research Michael Pritchard proposed a company, which had adopted a customer service strategy founded on the central precepts of the service profit chain, designed a measurement system to track performance of each of the variables in the service profit chain model, with a view to demonstrating the supposed links between the employee and customer experiences of the stores and business performance (Pritchard & Silvestro, 2005).

To summarize, the service profit chain is a conceptually appealing theory of organizational performance, and the empirical evidence suggests that it may be applicable at the business unit level of analysis.

Chapter 3

RFID IN TOURISM

Overview

This chapter provides detail information role of service quality, and RFID in the tourism industry. In addition information around the importance of the RFID in solving problems mention as well.

3.1 RFID Ability in Tourism Industry

RFID technology allows hospitality organizations to collect real-time data about their customers that helps them to customize their services. Some of the RFID applications in the hospitality industry include cashless payment systems, building intelligence systems, customer loyalty systems, luggage tracking, inventory tracking and asset management, RFID electronic locking systems, and RFID meeting technology. The reason for choosing these RFID technologies was because they are either already being used or they have a great potential to be used by hospitality companies. An RFID Cashless Payment System allows guests to set up an account linked to an RFID wristband that then can be used to spend money anywhere in the hotel. This method eliminates the need to carry cash and/or credit cards to make guest purchases within the property (muta, 2006). hersheypark, an amusement park in hershey Pennsylvania, has implemented a RFID cashless point of sale system. With the new system, guests are able to make in-park purchases, check balances, and load additional funds onto their wristbands at any of the park's 200 RFID-enabled POS stations (RFID Solutions Online, 2012).

Figure 11 Cashless Payment

RFID Building Intelligence System is another example of RFID technology in the hospitality industry. One example of such a system is RFID technology that enables guests to unlock their room door automatically as they approach it or as they wave the RFID-enabled device (such as a wristband) over the door lock. When the guests enter the room, they could find the room set up to their individual preference for environment (such as lighting, window shades, room temperature, music, and TV channel) (muta, 2006). Grand hyatt SanFrancisco has installed RFID locks as a part of comprehensive renovation of its 659 guestrooms. The RFID locks allow contactless guestroom entry, and they give hotel staff a real-time view of guestroom access attempts for quick security response in the event of an intruder (VingCard Elsafe, 2012).Another use of RFID technology in the hospitality industry is the RFID meeting technology. A nametag with an RFID chip in it can provide meeting planners real-time information about the meeting. With RFID technology, meeting planners could see what attendees are doing in meeting rooms in real-time and analyze all the information after the show is over. The data collected through RFID tags during the meeting can be used to help organizers with future conference planning such as

optimizing sessions around interests and identifying the demands of the conference attendees (korn, 2006).

Companies in the tourism industry have employed RFID in a wide variety of applications (Hozak, 2012). The technology has been used for inventory control and tracking of alcohol (Swedberg, 2008, 2011b; Wasserman, 2011), pool towels, uniforms ,costumes, and luggage (NEC, 2008). It has helped reduce waiting in line at hotels (Kugler, 2011), resorts, cruise ships (Cruise Critic, 2011), and . RFID-tagged cards and wristbands have facilitated more convenient purchasing at water parks, resorts, and cruise ships (Goldhaber, 2010; Wasserman, 2007, 2011). The technology has made it easier to find people on cruise ships (Swedberg, 2010b) and at amusement parks (SafeTzone Technology Corporation, 2002) and ski resorts (Vail Resorts, 2010).

Using RFID for personal identification helps employees greet guests by name and serve them better, track and report guest performance for games and competitions (RFID Journal,2002; Contagious, 2010), cross-reference guests to pictures taken by company photographers (Goldhaber, 2011), automate messages on signs to give personalized guest directions, and automate social networking posts (Bast, 2011; Carr, 2010; Contagious, 2010; Swedberg, 2010c; Vail Resorts, 2010). The data from RFID have been used to improve marketing and operations that benefit both companies and guests.

Figure 12 Old System check-in

3.2 Role of Service Quality in Hospitality Industry

High-quality services improve customer satisfaction, increase market share, and enhance profitability of service organizations (Hoffman and Bateson, 1997). Researches on service quality generally focus on identifying errors as effective ways to improve quality, which results in incremental quality improvements. Another way to improve service quality is stated as service innovation. Service innovation is defined as introducing radical changes, which means going beyond the usual service and developing new designs, procedures, methods, service concepts, and service delivery systems. (Burrill and Ledolter, 1998). Radio frequency identification could construct opportunities for innovative service with a swift adoption and improvement (Curtin, Kauffman, & Riggins, 2007).

Tourism has always been one of the principal application areas for technological advancements. Hospitality firms, such as hotels, are shown as an ideal example of a market that could benefit from service innovation (Victorino et al., 2005). First, from a customer's perspective, the hospitality market is perpetually inundated by many

similar, often easily substitutable service offerings. Hotels can enhance their offerings with innovative features to customers so that they have the chance to differentiate from their competitors (Reid and Sandler, 1992). Secondly, in order to stay competitive in such a dynamic environment, managers will need to make innovative changes that focus even more intensely on customer preferences, quality, and technological interfaces (Karmarkar, 2004). Thirdly, travelers do not demonstrate truly brand loyal behavior. Travelers instead choose to patronize hotels that offer the best value proposition under existing budgetary constraints. Determining which services are preferred by guests is stated as a major challenge for enhancing guest's experience (Olsen and Connolly, 2000). Once customers' preferences are understood, the challenge then becomes prioritizing those preferences that add the greatest value to the hotel's existing service offering.

Invisible identification helps the hospitality industry in providing exceptional service to guests when they visit the hotels. Guests are vowed by the experience of being recognized by the staff and being looked after with all their likes and dislikes documented and adhered to. RFID makes this happen thus greatly enhancing the guest experience of loyal and special guests. This seamlessly helps the staff serve their guests better thus ensuring loyalty and repeat visits to the property.

Chapter 4

MODEL AND HYPOTHESIS DEVELOPMENT

Overview

This chapter provided brief information about the model of the study and hypothesized relationship alongside of those of literature review. Information about the study model and variable definition and relationship presented to clarify the study direction in tourism and hospitality literature.

Hypothesized relationship developed based on the variables and theoretical background of the study as well. Detailed information about each hypothesis is provided due to clarify the thesis intention and dimensions.

4.1 Conceptual Model Development

According to the model of the study (Figure 13), RFID has moderating effects on independent such as location, self-check-in, and bill settlement and dependent variables such as customer satisfaction, customer loyalty and profitability of the company considering the implementing of RFID technology in their hotel.

Independent variables convey the profit chain model which was extensively examined and used by numerous researchers in any industry, but this study tried to evaluate the effects of RFID as the new technological advancement on profit chain model to undermined if this relationship acceptable for applying RFID to the hotel technological facilities.

Age, gender, marital status, and education based on the theoretical investigation considered as the control variables to control the accuracy of the model path.

4.1.1 RFID and Independent Variables

The conceptual model demonstrated that RFID as the Radio Frequency Identification as the mediator of the effects on two groups of the variables with in one side are independent variables such as customer bill settlement, location and Self-Check-in, and on the other side is dependent variables derived from profit chain model.

RFID increase the performance of check-in process in high season especially with high number of customers (Shepard, 2005). Most of the time customer need to wait for a long period of time to check-in to the hotel so providing self-check-in facility can decrease the dissatisfaction and aggressiveness of the customers, and also decrease the stress level of the frontline employees (Shepard, 2005).

RFID give ease the reliability of the bill settlement in the hotel. Most of the hotel reported bill problems in high seasons regarding mistakes in calculating and allocating bills for each hotel rooms based on the performance and usage of the customers from room services (Shepard, 2005). Some of these services are room and bar services which every customers can used their services with their room numbers without any payment at that time but they will pay the bills at the payback time, so any mistakes can raise problems for both customers and hotel as well. So providing efficient facility with the help of technological advancement would be a great help for both hotel and its customers (Zhou, 2009).

Another independent variable is Location. Most of the parent report that they most of the time worry about the exact location of their child and/or children. So they cannot

enjoy hotel facilities and services because of their child/children. Therefore providing RFID can improve their awareness of the exact location of their child and/or children. Hotels equipped to this technology can have priority in their customer buying decision (Chen, Wu, & Su, 2008). This model proposed that the positive effects of RFID on these activities.

4.1.2 RFID and Profit Chain Model

RFID as mentioned previously ease the performance of the hotel and increase reliability and comfort ability of the customers in using hotel facilities and enjoying their stay in the hotel with no anxiety about their usability of the services and their child and /or children (Shepard, 2005). Thus RFID proposed to increase the customers' satisfaction rate (Chen, Wu, & Su, 2008).

RFID brought useful information to the profit chain model with utilizing different perspective of the data (Zhou, 2009). Visibility of demanded information in every requested time is one of the most significant characteristics of RFID. Providing the Item visibility information to the customers can affect their satisfaction of the hotel services and promote the hotel priorities on customer comfortability and satisfaction (Park et al, 2008). Identifying satisfaction rate of the customer about the usage of RFID tags during their stay can improved the company marketing and management strategies (Zhou, 2009).

Moreover, RFID lead the customer satisfaction to customer loyalty if the organization uses this technology efficiently with clear information and guidelines to the customers. Retaining satisfaction of the customers make them loyal one to the hotel services (Park et al, 2008).

Keeping and increasing satisfaction level and number of loyal customers motivate them to visit and used the hotel accommodation plus service more frequently than before and also provides more positive words of mouth about the hotel facilities among the customers (Park et al, 2008); therefore lead to increase the visited customers to the hotel and increase hotel and organization profitability rate in compare to the competitors. Using RFID facility increases the competitive advantage of the equipped hotel against the competitors (Zhou, 2009).

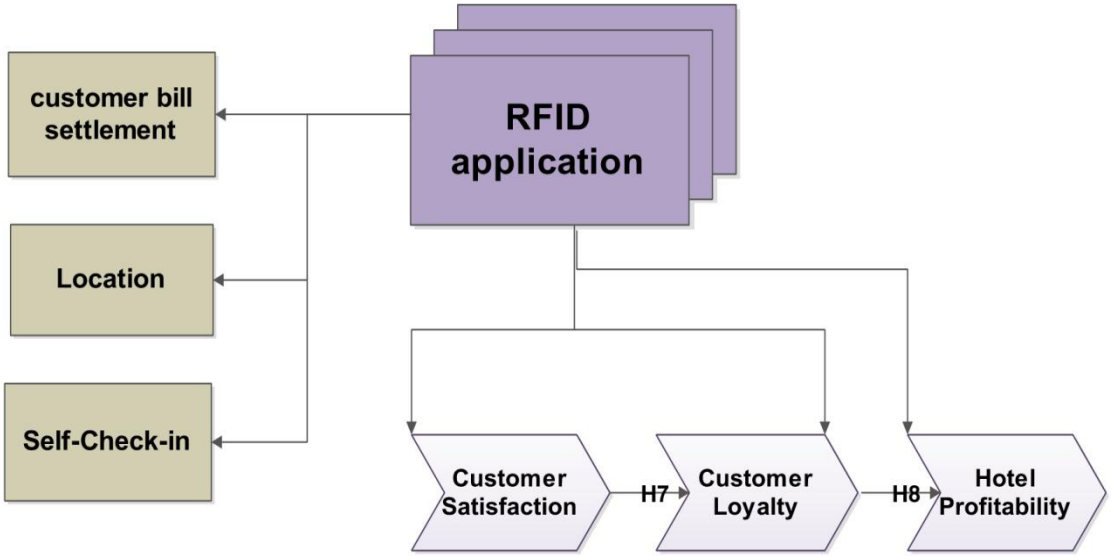

Figure 13 Conceptual Model

4.2 Hypothesis Development

Based on information and background presented in the literature considering empirical studies theoretically; this study proposed the relationship among different study constructs to examine the suggested links statistically.

4.2.1 RFID and Independent Variables

Information Communication Technology recently has been changed almost every aspects of the global business and people lifestyles (Porter, 2001). One of the new technological advancement eases the performance and reliability of the organizations

performance is RFID. Radio-frequency identification (RFID) is an automated technological tool playing an important role by establishing and promoting intelligent system in easing the operation management (Dutta et al, 2007).

RFID applications can be used to identify objectives and items with visibility, like construction intelligent system, customer loyalty mood, cashless payment system baggage tracing, and inventory tracking in the hospitality industry (Park et al, 2008). So this study proposed that providing RFID as the new technological advancement ease the bill settlement and payback of the customers mostly in high season in hotel. So the first hypothesis proposed as follow:

H1: RIFD has positive effects on Customer bill settlement (Figure 14).

As we mentioned before, RFID provided the clear visibility information of the exact location of another RFID tag in the supported environment. Although most of the hotels try to worry about their customers relevant issues and topics but most of them required numbers of staffs to keep the customers satisfied and respond to their needs relevantly and rapidly, but it worth to mention that recruiting staffs cost the firm a lot and impose some more problems for the firm. Considering the inflation and economic crisis of 2008, many firms fired most of their staffs to decrease the cost and consequently the degree of attention to the customers decrease.

So, applying RFID as the most recent technological advancement can identify valuable information to the customers and managers as well. Providing visibility information to the customers about the location of their child and/or children is in debt

to availability of the RFID (Dutta et al, 2007). So this study proposed second hypothesis as follow:

H2: RFID has positive effects on improvement about Location (Figure 14).

Providing technology with multi-tasking abilities helps the hotels and customers to promote their activities in the organization. One of the first activities customers involve in their first entering stage to the hotel is check-in. in high seasons, doing customer check-in require time so customers have to wait for a long period of time to do check-in. RFID make it accessible for customers to do self-check-in for their stay in the equipped hotel (Dutta et al, 2007). So RFID ease the check-in process for customers in high season and crowded hotels. So the third hypothesis suggested as follow:

H3: RFID has positive effects on self-check-in process (Figure 14).

4.2.2 RFID and Dependent Variable

Radio Frequency Identification technology (RFID) is the leading technology in automatic identification and data collection. It was first discovered during the Second World War in 1935 (Nair et al., 2008). According to Chao et al (2007), RFID called as one of the top ten technological advancement plays causal and contributory tools in 21st century. RFID is believed to be one of the most promising automated tracking enablers has great influence on logistics and supply chain management (SCLM) (El Ghazali et al., 2011).

Radio frequency identification is kind of recognizing data by radio waves. It is the best way for hoarding and remotely regains information using systems RFID tags or transponders (Feng, 2011). Supply chain management (SCM) is managing the transactions along the supply chain from sourcing raw materials to final delivery to the consumer. The high precision of this technology give the customers' sense of comfortability about their stay and more importantly increase the amount of benefits they gain from the firm (Park et al., 2008).

Customer satisfaction has six constructs. These constructs are image, perceived quality in hardware and software, customer expectation, value, satisfaction, and benefits. All of these six constructs have interrelated connection with each other (ECSI, 1998). Image which is the perception of the customer from the services or product usage is deeply link with customer expectation (Park et al., 2008). Customer expectation which the degree of customer pre-designed image relate to the quality customer perceived from the organization. Quality perceived by organization is depended on value and benefits customer get from the service provider. If all of these construct meet each other then, satisfaction would be the definite result of the process (ECSI, 1998).

RFID as the high qualified technological advancement increase the value and benefits delivered to the customers so they fully meet and even delighted the image and expectation of the customers toward service and consequently resulted in customer satisfaction (O'Loughlin & G. Coenders, 2004). Based on this information, fourth hypotheses suggested as follow:

H4: RFID can positively effect on Customer satisfaction (Figure 14).

Satisfaction cannot lead directly to the customer loyalty if the service provider lack to keep the service quality delivered to the customer as before. So those hotels provide RFID as the recent technological advancement with the aim of serving customers more easily through the sense of comfortability should try to continue the quality communicated and delivered to the customers as before with even advancement in their quality and value delivery process (Park et al., 2008).

According to Wang and Liao (2007), Seddon (1997) and Park et al (2008), RFID increase the loyalty of the customer regarding the effectiveness of the software in attracting the catching the full attention and expectation of the customer. According to Karkkainen (2007), RFID increase the positive words of mouth between the customer and increase the loyalty percentage of the customer. So based on this information, fifth hypothesis suggested as follow:

H5: RFID can positively effect on Customer Loyalty directly (Figure 14).

Doeer et al. (2006) evaluated the cost and profitability of those firms implements RFID with those not. The interesting result which is consistent with our study is that those firms apply RFID software and technology to their infrastructure at the first steps reported the high costs but their profitability in compare to those didn't apply and implement RFID was greatly higher (Park et al., 2008).

Satisfied and loyal customers prefer to visit those properties which previously meet and satisfied their expectation (Zhou, 2009). So, the profitability of the organization would be increased relevantly. Satisfactory implementation of the promised

equipment lead to increase the customer repeated behavior in return (Zhou, 2009). So based on this information, sixth hypothesis developed as follow:

H6: RFID can positively effect on Hotel Profitability directly (Figure 14).

4.2.3 Mediating Role of RFID

RFID as the new technological advancement of 21st century increase the serving process of the customer demands within the short period of time with providing visibility information for the customers (Park et al., 2008). This new top ten technology increased the satisfaction of the customer and with mediating role of this technology; customer satisfaction would be lead to customer loyalty. Loyalty of the customers include high words of mouth and repeated behavior so without implementing RFID this relationship would not be met and lead to customer loyalty (Doeer et al., 2006).

Satisfaction of the customer is in debt to accuracy of the RFID implementation and meeting the expectation of the customers. So, RFID plays as the mediating role in this relationship which is connected customer satisfaction to customer loyalty. And customer satisfaction leads to customer loyalty indirectly.

Based on this information, the seventh hypothesis proposed as:

H7: Customer satisfaction leads to customer loyalty due to implementation of RFID indirectly (Figure 14).

Increasing number of customer increase loyalty rate. Implementation of RFID as mentioned before lead to customer satisfaction and keeping the customer satisfy lead

to customer loyalty in the long run. Based on Yavas et al (2013), customer loyalty guarantees the number of repeated purchases of the customers from service providers and positive word of mouth.

Positive word of mouth increase both awareness and loyalty of the greater number of the customers toward organization (Dehghani et al., 2013). Customer loyalty means repeating buying purchase behavior. RFID increase customer loyalty and increased in loyalty of the customers increase the number of returned customers to the organization so profitability of the firm would be increased in return.

According to the information presented, the eighth hypothesis suggested as follow:

H8: Customer loyalty leads to hotel profitability due to implementation of RFID indirectly (Figure 14).

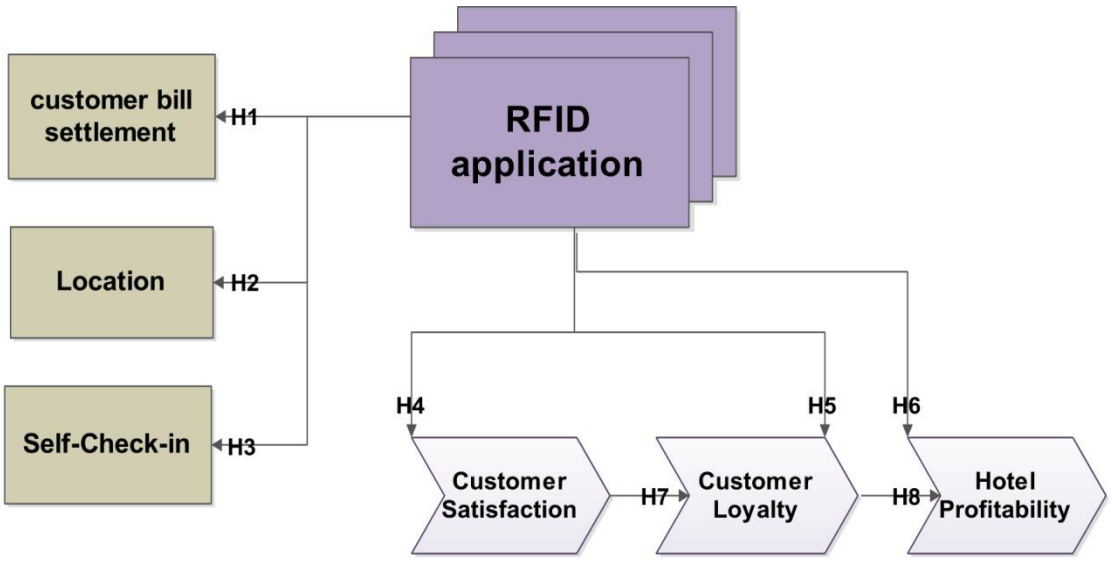

Figure 14 Hypothesized Model

According to the developed hypothesis, RFID proposed to have the mediating role between independent variables and dependent variables. In this study independent variables are customer bill settlement, self-check-in and location. And independent

variables are customer satisfaction, customer loyalty, and profitability. This relationship would be statistically analyzed in the next chapter of the thesis.

Chapter 5

METHODOLOGY

Overview

This chapter provided the information regarding sample, methodology and approaches types used to evaluate the theoretical contribution of the study model statistically through using various reliable statistical methods.

Quantitative and qualitative methods refers to the type of data being collected (quantitative data involve numeric scores, metrics, and so on, while qualitative data includes interviews, observations, and so forth) and analyzed (i.e., using quantitative techniques such as regression or qualitative techniques such as coding) (Bhattacherjee, 1.1.2012). This study use quantitative method. Quantitative research is about asking people for their opinions in a structured way so that you can produce hard facts and statistics to guide you. To get reliable statistical results, it's important to survey people in fairly large numbers and to make sure they are a representative sample of your target mark. Quantitative method typically includes customer surveys and questionnaires. These can be conducted face-to-face with a clipboard and pen, over the telephone, via post or email, online or via your website. Survey questions have to be carefully considered so that the results will provide meaningful data. Justification for quantitative research method is the appropriateness of quantitative study for this particular topic as the quantitative method allows to collect numerical data to measure and to assess the job satisfaction and loyalty by

proposed questioner. And qualitative approach for this type of the study may not generate a very comprehensive and reliable result.

5.1 Deductive Approach

This study used deductive approach (reasoning) defined as implying theory to test whether the proposed relationship is meaningful and reasonable or not (Hyde, 2000). This approach evaluates the construct of the study to analyze the deduction of the study. This study examined the effects of RFID on independent variable such as bill settlement, location, and self-check-in with dependent variables of profit chain model such as customer satisfaction, customer loyalty and organization profitability in hotel industry.

5.2 Cross-Sectional Method

This study distributed the data through using cross-sectional method. This method defined as distributing and analyzing all of the study variables consisting independent and dependent variables simultaneously over the short period of time. Cross sectional studies called multi-dimensional studies aimed to evaluate exact effects of all variables on each other through the same time interval.

5.3 Sample of the Study

Sample of this study is convenience, Convenience Sampling (also known as availability or accidental sampling) This form of sampling involves the researcher selecting the most readily available respondents, regardless of characteristics, until the required sample size has been achieved (Tansey, 2007). This study collected its data from four and five star hotels in North Cyprus via Mersin 10, Turkey serves as the study setting among the customers including domestic and international tourists.

Hotels selected for the study are mostly international hotels with having high priority on quality delivery to their customers.

Research team got the permission in order to collect the data and data was collected during one week among the domestic and international tourists mostly from United Kingdom and Russia. 300 questionnaires distributed among so called tourists and 250 questionnaires was collected which all of them was used to analyze the data so the response rate was 83.33% showed the high reliability of the data. Questionnaires distributed regardless of the respondent age, gender, education and marital status to prevent any biased in the study results. Data analyzed through SPSS, ANOVA, and Pearson Correlation to assess the questionnaires information.

5.4 Description of the Data

In this chapter, the data gathered through distributed questionnaire, will be described using descriptive statistics and inferential statistics. This chapter has two parts. In the first part of the research, descriptive statistics for demographic characteristics of the respondents evaluated

The goal of data analysis is to understand the impact of RFID as the recent and new technological advancement on customer bill settlement, improvement about location, self-check-in process, customer satisfaction, customer loyalty and hotel profitability.

5.5 Demographic Variables

According to the above Table 1, out of total number 250 respondents, 51% of respondents were male and 48.8 percent were female Hence, the distribution of data was approximately non-biased. This data showed that the questionnaires distributed approximately equally between individuals.

According to Table 1, out of total number of 250 respondents, 40% of respondents were aged between “38-47” with having the highest frequency. The lowest rate was 5.2% of the respondents were aged between “58-67”. According to the Table 1 5.2, most of the respondent was adult individuals between 28 up to 57 years old.

Education is considered as one of the controlling variables to test the accuracy of the result and study finding. Respondent education was calculated from high school up to Doctorate degree to examine whether education can be considered as one of the effecting variables.

According to Table 1, the total number of 250 respondents, 35% of respondents stated that their degree of education was MA and they had the most frequency among the rest of respondents. The lowest frequency was 22 that belong of respondents which their degree was college attendant. Marital status of the respondent also considered as one of the control variables to test the result accuracy.

Table 1- Respondents' profile

Demographic Variables	Frequency	Percent
Gender		
Male	128	51.2
Female	122	48.8
Total	250	100
Age		
18-27 years old	40	16.0
28-37 years old	52	20.8
38-47 years old	99	39.6
48-57 years old	46	18.4
58-67 years old	13	5.2
Total	250	100
Education Level		
High School	19	7.6
Bachelor	44	17.6
Master	87	34.8
Doctorate	78	31.2

College attendant	22	8.8
Total	250	100
Marital Status		
Single/Widowed	23	9.2
Married	227	90.8
Total	250	100

According to Table 1, out of total number of 250 respondents, 91% of respondents were married and 9 percent were single or widowed This result showed that most of the respondents were married couples so this can meet the requirement of study hypothesis for location of their child/children. Another meaning would be concluded that married individuals are more interested to understand about their living environment rather than singles. So this data showed that research group targets the accurate respondent for analyzing the study hypothesis.

5.6 Preliminary Analysis

To determine dimensionality of the variables of the study, Exploratory Factor Analysis (EFA) has been used (Table 2). The results demonstrated that all item load acceptable level of factor loading under relevant dimension (*factor loading>0.4*).

Reliability of the study has been check by Coronbach alpha (Table 2) and the results revealed that all coefficients are more than 0.7. This is satisfactory cut-off regarding internal consistency of the items for each construct**.**

Table 2- Results of Exploratory Factor Analysis and Reliability test (Choronbach alpha)

Scale Items	Factor Loading	Alpha
Customer Loyalty		
DO you prefer repurchase a hotel in the next time?	0.81	0.81
DO you recommend a hotel with feature to friends?	0.80	
If using this system, can caused you repurchase the hotel?	0.75	
Do you recommend the hotel equipped to this service to your friends?	0.74	
Does the property in system can lead to your repurchase?	0.72	
Do you recommend the hotel equipped to this service, anyone?	0.69	

RFID Application		
Do you agree with new system (RFID), which able control accurate bill settlement in the hotel?	0.64	0.75
In case this system works, if applying this system will enhance your convenience?	0.64	
If the hotel equipped new system like RFID, do you stay longer in this hotel?	0.63	
Do you will pay more money for the hotel, which employed RFID technology?	0.86	
If the hotel equipped RFID system, do you stay longer in this hotel?	0.83	
Do you will pay more money for the hotel, which employed RFID technology?	0.80	
Customer Satisfaction		
In case this system works, if applying this system will increase your satisfaction?	0.80	0.80
Does the system can lead to your satisfaction?	0.69	
Do you think RFID in system can be helpful?	0.68	
Does the property can makes you satisfied?	0.53	
Hotel Profitability		
If the hotel equipped RFID system, do you stay longer in this hotel?	0.84	0.86
If the hotel equipped RFID system, do you choose this hotel as your first vacation options?	0.76	
Do you will pay more money for the hotel, which employed RFID technology?	0.76	
Location		
Are you concerned about your child, when he/she plays in hotel environment (like garden, pool)?	0.74	0.84
Are you willing to know location of your child, when he/she is far away from you?	0.71	
Have you had bad experience, like you lost your child for minutes?	0.61	
Whether this issue has made you nervous?	0.84	
If this experience has had a negative effect on your decision for repurchase the hotel?	0.83	
If hotel provide a system, that make you able to find your child in any time, does it brings you convenience?	0.82	
Self-Check-in		
Does check-in long queue in hotel is a nightmare for you?	0.80	0.77
Does check-in long queue caused you lose patience?	0.73	
Have you ever experienced to be waiting in a queue at a crowded check-in?	0.66	
In case you had bad experience, if it had a negative effect on your perspective related to the hotel?	0.83	
Do you agree with using technology for easer check-in?	0.82	
If you enter crowded hotel, do you prefer check-in automatically (self-check in) for a more quick process?	0.81	
Do you prefer a hotel that is equipped to self-check in system?	0.89	

Customer Bill Settlement		
Do you have negative experience about bill settlement (for example imagine at the time of check out from hotel, hotel charge you for an amount more than what you have used)?	0.87	0.72
Does negative experience created bad feeling about the hotel?	0.57	
If your answer is yes, did this reason have negative influence over your decision for the next hotel reservation (repurchase)?	0.55	
Suppose this negative experience has happened, whether it has a negative impact on your decision for repurchasing?	0.55	
Sometimes you need to take your wallet with you (like pool side or in SPA), Does this issue worrying you?	0.52	

Note: KMO test revealed the sample size was educate

To check common method variance Single factor analysis has been used and results showed that 21 percent of variance has explained by single factor that confirms that there is nort serious problem in terms of common method bias.

5.7 Test of the Hypothesis

Here we analyzed the hypothesized relationship as we mentioned in the third chapter. Every hypothesis provides especial evaluations and consideration which the analyzed data showed the supportive or unsupportive results of hypothesizes. To test hopothesis of the study correlation and regression analysis have been employed.

5.7.1 Direct effect

To check hypothesis 1 to 6, correlation analysis was conducted that Means, Stansard deviations and correlation matrix of the variables are provided in Table 3.

Table 3- Means, Standard Deviations and Correlation matrix of the variables

Variables	Mean	SD	1	2	3	4	5	6	7	8	9	10
1.Age	2.74	1.08	1									
2.Gender	1.49	0.50	.013	1								
3.Education	3.15	1.06	.228**	-.049	1							
4.Martial	1.92	0.28	.047	-.022	-.093	1						
5.Bill Settlement	4.10	0.68	.065	-.021	.021	-.023	1					
6.Location	3.91	0.83	.111	-.029	.115	.094	.034	1				
7.Self-Check-in	3.85	0.69	.045	-.013	.012	.074	.046	.168**	1			
8.RFID App.	3.74	0.70	-.040	-.004	-.134*	.075	.173*	.129*	.230**	1		
9.Customer Satisfaction	4.14	0.64	.096	-.104	-.092	-.024	.190**	.009	.195**	.636**	1	
10.Customer Loyalty	4.10	0.59	.073	-.037	-.122	.048	.135*	-.067	.262**	.696**	.058	1
11.Hotel Profitability	3.86	0.87	.052	-.025	-.098	-.058	.024	-.016	.131*	.112	.560**	.292*

Note:**. Correlation is significant at the 0.01 level (2-tailed) and *. Correlation is significant at the 0.05 level (2-tailed).

According to correlation results in Table 3, there is a significant and positive correlation between application of RIFD and customer bill settlement (*r=.173, p<0.05*). Therefore **Hypothesis 1** was supported.

Location and RIFD has significant and positive relationship (*r=.129, p<0.01*) such that application of RIFD affect the location factor positively. Thus, **Hypothesis 2** was supported (Table 3).

There is a significant and positive assassin between RFID and self-check-in process in hospitality industry of study area (*r=.230, p<0.01*). Such result confirms that RFID has positive effects on self-check-in process. Hence, **Hypothesis 3** was supported.

Based on correlation analysis that presented in Table 3, there is a significant and positive linkage between RFID and customer satisfaction (*r=.636, p<0.01*) and customer loyalty (*r=.696, p<0.01*). Therefore, **Hypothesis 4 and 5** were supported.

There is not significant relationship between application of RFID and hotel profitability (*r=.112, ns.*). Then, **Hypothesis 6** was not supported.

5.7.2 Mediation test

To test mediation role of RFID on the relationship between customer satisfaction and customer loyalty and also customer loyalty and hotel profitability, Hierarchical Regression Analysis has been used (Table 4).

Table 4- Results of Hierarchical Regression Analysis to test mediating role of customer satisfaction

	Dependent Variable: Customer Loyalty	
	Standardized regression coeeficinet (Beta*)*	
Variables	**Step 1**	**Step 2**
Independent Variable: Customer Satisfaction	0.06	0.35^{**}
Mediator: RFID Application		0.71^{**}
R^2	0.4^{*}	0.29^{**}
ΔR^2		0.15^{**}

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

In step 1, customer satisfaction has not significant effect on customer loyalty (*Beta=0.06, ns.*). When RFID entered to the model as mediator, customer satisfaction significantly and positively boost customer loyalty (*Beta=.35, p<0.01*). There is remarkable incΔemnt in R^2 in step 2 ($R^2=0.15$). Such results proved that RFID fully mediate the relationship between customer satisfaction and customer loyalty. Thus, **Hypothesis 7** was supported.

Table 5- Results of Hierarchical Regression Analysis to test mediating role of customer Loyalty

	Dependent Variable: *Hotel Profitability*	
	Standardized regression coeeficinet (Beta)	
Variables	***Step 1***	***Step 2***
Independent Variable: Customer Loyalty	0.31*	0.41**
Mediator: RFID Application		0.24
R^2	0.06*	0.27**
Δ_{R^2}		0.11**

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

The results of hierarchical regression analysis revealed that RIID partially mediate the relationship between customer loyalty and hotel profitability (*Beta=.41, p<0.01*). R^2 increase from 0.06 to 0.27, when the RFID insert to the equation as mediator (Table 5). Therefore, **Hypothesis 8** was supported.

5.8 Findings of the Study

Based on the result of data analysis, interesting finding achieved alongside of theoretical investigation of literature. Results of test of hypothesis of this study have been summarized in Table 6. Out of the pool of hypothesizes; seven out of the eight hypotheses were supported and significant while the one proposed the relationship between RFID and profitability was unsupported because of indirect effects of RFID on hotel's profitability.

Table 6- Summary of Hypothesis testing

Hypothesis	**Description**	**Result**
Hypothesis 1	RIFD - customer bill settlement	Supported
Hypothesis 2	RIFD - location	Supported
Hypothesis 3	RFID - self-check-in process	Supported
Hypothesis 4	RFID - customer satisfaction	Supported
Hypothesis 5	RFID - customer loyalty	Supported

Hypothesis 6	RFID and hotel profitability	Not Supported
Hypothesis 7	Customer satisfaction – RFID - customer loyalty	Supported
Hypothesis 8	Customer loyalty- RFID- Hotel Profitability	Supported

RFID impose some sort of costs to the hotel which if they cannot apply it well, it would lead to decreasing the profitability of the hotel so RFID can bring profitability to the hotel via accurate implementation of the technology which would be resulted in increasing the customer satisfaction, customer loyalty and finally increase the number of visits and spending in the hotel and consequently lead to profitability of the hotel in return.

So, RFID as the main theory of the study confirmed to have the supporting role in successfulness and profitability of the company especially for hotel industry with excessive and high interaction under high probability of any non-compensational mistakes. This study found that RFID has positive and direct effects on customer bill settlement, Location and self-check-in easiness as the customer wouldn't be worry about any problem for their stay in the hotel.

So first three hypothesizes was supported due to their high positive responsiveness among the respondents.

According to theoretical evaluation of the relationship between customer satisfaction and RFID, the fourth hypothesis suggested that RFID as the new and safe technological advancement effects on customer satisfaction rate which this satisfaction will be lead to customer loyalty if the hotel try to always actively use the latest technological advancement for customer comfortability. So the fourth

hypothesis considering the relationship between RFID and customer satisfaction was supported and significant.

Interestingly fifth hypothesis questioned the relationship between RFID and customer Loyalty was significant and supported. This relationship was also theoretically accepted due to the fact that those hotel mostly in western and developed countries applied this new technology named RFID to directly duplicated and affected on loyalty of the customer; moreover this relationship between RFID and customer loyalty can be supported indirectly regarding the effects of satisfaction on loyalty level of the customers in equipped hotel.

Sixth hypothesis was unsupported due to insignificant direct effects of RFID on hotel profitability. This unsupported relationship between RFID and profitability may be due to the fact that RFID cannot effect on profitability of the hotel directly existence of active implementation of employees performance and managerial supervision effect on customer satisfaction, then loyalty and finally lead to profitability of the hotels. Therefore, the seventh hypothesis was supported consequently.

Hypothesis eight conveys the relationship between customer loyalty and hotel profitability according to implementation of RFID. Consistent with empirical investigation, this relationship was also supported statistically based on the questionnaire and respondents answers.

We controlled effects of control variables on the RFID effects on the independent and dependent variables.

Out of the pool of eight hypotheses, just one hypothesis was not supported; the rest of the hypothesis supported both theoretically and statistically.

Moreover, mostly the educated customers understand the value of this new technology which can effect on their purchasing behavior and future buying perspective.

This study added new and unique information to the hospitality literature, thanks to the knowledge of the researchers which combined the latest safe technology in improving the comfortability of the customer and easiness and safety of the hotel performance for their customers. Applying this new technology help the company to achieve competitive advantage over its competitors.

Although most of the hotels try to increase their customer satisfactions but most of them still bothering from related issues such as bill settlement, location, and self-check-in. although customers are satisfied with the hotel services and facilities but these three issues were most of time annoying and stress making for most of the customers especially those with child and/or children.

Chapter 6

CONCLUSION

6.1 Discussion and Conclusion

Competition between companies and industries can take different forms and approaches. The tourism industry is not an exception to this rule. One of the areas which companies and firms can achieve a competitive edge is innovation in technology and adoption of new methods in the process of production and consumption (Trupati, 2008; Boudreau et al, 1998). One of the beneficial utility of technology, among many others, is the customer satisfaction and loyalty in the context of facilitation of product consumption with a high level of convenience for the consumers. As the main argument in this study, the tourism industry is potentially conducive to innovation towards achieving the enhancement of customer satisfaction and eventually customer loyalty (Sood and Basu, 2013). Therefore, RFID is a new technology that has the potential to add new dimensions to the customer's satisfaction by increasing the utility of product within the tourism industry where an 'experience' is packaged and offered to the customers. Although having new technology in the industries can be useful; however, to apply the new technology, it is essential to understand the processes of its applicability, workability, and the temporal aspect of its adoption. Within such framework, this study focused on the analysis of role of RFID as mediator and means towards customer satisfaction, customer loyalty, revenue improvement and overall growth of accommodation sector. In addition, technological innovation such as RFID can be an important factor of restructuring the

firms approach to provision of services especially in tourism sector. In a way, RFID can function as an element of market dynamic and economic agent in increasing the satisfaction and loyalty. Based on the academic and empirical study, RFID introduced as a technology, which is able to improve efficiency in the process of service provision; therefore, it is a vital element that becomes a policy toll for the managers to be diffused throughout the organization**.** Technology and technological innovation play a central role in the organization and delivery of services and is a driver of optimal outcomes. One should bear in mind that diffusion of such technology demands a managerial commitment to adopting new approaches in the organization (Cain and Mittman, 2002).

In this research there are 38 questions, which have been asked from three dimensions, t orderly bill settlement, location, and self-check in of customers in the four and five star hotels (North Cyprus). The number of questionnaires was 250 approximately. Main goal was to evaluate customer perceptions about usage RFID in enhancing their satisfactions and loyalty, which leads to profitability in the hotels. For this purpose were provided nine hypothesizes.

Based on the results obtained, determined RFID adoption has relative advantage and also stronger effect on customer perception in the hospitality industry. Current study indicate RFID technology have ability increase customer satisfaction and loyalty. RFID will effect positively in hotel operations and provide customer convenience, so in the end they would recommend it to others. Research illustrate the using of RFID is a factor in the operations process toward improve customer service. Although RFID modifies customer service, it is capable of creating innovation service in the tourism industry; Location's process is one example of innovation service, further more

bringing convenience to costumer, gives them a sense of uniqueness. So based on current study the usage of RFID is very useful, and makes a hotel with this property as a brand in the market.

6.2 Implications of Study

In the light of this study's findings, two major suggestions to management are offered here. This study shows that consumers will respond positively to the deployment of emerging technologies. This study provides useful implication for tourism industry and similar organization. First, suggested that due to lack of RFID technology expertise, the hospitality operators should hire experienced consultants or increase the level of technological knowledge of the employees by sending them to training sessions on the use of RFID technology. In addition, hospitality operators should allocate sufficient funds for RFID technology investments by evaluating and adjusting their information technology budget.

6.3 limitations and future study

This study was a perception-based study and actual RFID technology use was not assessed in this study. Information about RFID technology in general and about hospitality RFID technologies (some images also provided for hospitality RFID technologies in the questionnaires) were provided in the questionnaires and assumed to be informative enough for respondents to create perception about RFID technology. Future research that will measure the actual use of RFID technology may provide more accurate and valid results for hospitality operators' perceptions about RFID technologies. There may be other factors that influence a decision whether or not to adopt RFID technologies in the hospitality industry. Future research could explore whether other factors (e.g., cultural differences, organizational size) are associated with RFID adoption. In addition, to obtain detailed information about RFID

technologies in the hospitality industry, future research might explore different kinds of hospitality RFID technologies. Finally, the current study was limited to North Cyprus hospitality operators. More research involving other countries would provide useful information for comparing cultural differences in RFID adoption in the hospitality industry.

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APPENDICE

Appendix A: Questionnaires

EASTERN MEDITERRANEAN UNIVERSITY
FACULTY OF TOURISM
TURKISH REPUBLIC OF NORTH CYPRUS (TRNC)

Dear respondent

As part of my M.S. research/thesis at the Eastern Mediterranean University, faculty of tourism in North Cyprus, I am conducting a quantitative survey research to explore the potential of new technology that called Radio Frequency Identification (RFID), in the tourism industry, Specifically in the hotels sector in order to enhancing guests satisfaction and increase better experience to the customers. RFID is the wireless non-contact use of radio frequency to transfer data, for the purpose of the automatically identifying and tracking, tags attached to objectives. The tags contain electronically stored information. I will appreciate if you could complete this following questionnaire. Any information obtained in connection with this study will remain confidential. In any written reports or publications, no one will be identified. This is solely for a research purpose and you do not need to reveal your name. If you have any question about this research, please

Contact Rahele

Phone:

Thank you so much for your corporation

Part A-

Your age:

18-27 ( )
28-37 ( )
38-47 ( )
48-57 ( )
58-67 ( )

Your sex:

Male ( )
Female( )

Your education/ last degree:

High School ( )
Bachelor ( )
Master ( )
Doctorate ( )
College attendant ( )

Your marital status:

Single or widowed ( )
Married ( )

PART B-

For each of the statements below, please indicate the extent of your agreement or disagreement by placing a tick in the appropriate box.

The response scale is as follows:

1. **Strongly disagree**
2. **disagree**
3. **Undecided or Neutral**
4. **agree**
5. **Strongly agree**

Customer bill settlement					
1. Do you have negative experience about bill settlement (for example imagine at the time of check out from hotel, hotel charge you for an amount more than what you have used)?	1	2	3	4	5
2. Does negative experience created bad feeling about the hotel?	1	2	3	4	5
3. If your answer is yes, did this reason have negative influence over your decision for the next hotel reservation (repurchase)?	1	2	3	4	5
4. Suppose this negative experience has happened, whether it has a negative impact on your decision for repurchasing?	1	2	3	4	5
5. Sometimes you need to take your wallet with you (like pool side or in SPA), Does this issue worrying you?	1	2	3	4	5
6. Do you agree with new system (RFID), which able control accurate bill settlement in the hotel?	1	2	3	4	5
7. In case this system works, if applying this system will enhance your convenience?	1	2	3	4	5
8. In case this system works, if applying this system will increase your satisfaction?	1	2	3	4	5
9. DO you prefer repurchase a hotel in the next time?	1	2	3	4	5
10. DO you recommend a hotel with feature to friends?	1	2	3	4	5
11. If the hotel equipped RFID system, do you stay longer in this hotel?	1	2	3	4	5
12. Do you will pay more money for the hotel, which employed RFID technology?	1	2	3	4	5

Location					
13. Are you concerned about your child, when he/she plays in hotel environment (like garden, pool)?	1	2	3	4	5
14. Are you willing to know location of your child, when he/she is far away from you?	1	2	3	4	5
15. Have you had bad experience, like you lost your child for minutes?	1	2	3	4	5
16. Whether this issue has made you nervous?	1	2	3	4	5
17. If this experience has had a negative effect on your decision for repurchase the hotel?	1	2	3	4	5
18. If hotel provide a system, that make you able to find your child in any time, does it brings you convenience?	1	2	3	4	5
19. Does the system can lead to your satisfaction?	1	2	3	4	5
20. If using this system, can caused you repurchase the hotel?	1	2	3	4	5
21. Do you recommend the hotel equipped to this service, anyone?	1	2	3	4	5
22. If the hotel equipped RFID system, do you stay longer in this hotel?	1	2	3	4	5
23. Do you will pay more money for the hotel, which employed RFID technology?	1	2	3	4	5

Self-Check in					
24. Does check-in long queue in hotel is a nightmare for you?	1	2	3	4	5
25. Does check-in long queue caused you lose patience?	1	2	3	4	5
26. Have you ever experienced to be waiting in a queue at a crowded check-in?	1	2	3	4	5
27. In case you had bad experience, if it had a negative effect on your perspective related to the hotel?	1	2	3	4	5
28. Do you agree with using technology for easer check-in?	1	2	3	4	5
29. If you enter crowded hotel, do you prefer check-in automatically (self-check in) for a more quick process?	1	2	3	4	5
30. If you prefer a hotel that is equipped to self-check in system?	1	2	3	4	5
31. Do you think self-check in system can be helpful?	1	2	3	4	5
32. Does the property can makes you satisfied?	1	2	3	4	5
33. Does self-check in system can lead to your repurchase?	1	2	3	4	5
34. Do you recommend the hotel equipped to this service, anyone?	1	2	3	4	5
35. If the hotel equipped RFID system, do you stay longer in this hotel?	1	2	3	4	5
36. If the hotel equipped RFID system, do you stay longer in this hotel?	1	2	3	4	5
37. Do you will pay more money for the hotel, which employed RFID technology?	1	2	3	4	5